Undernutrition underlies a large proportion of post-neonatal childhood deaths, principally through increased susceptibility to life-threatening infections, and the severity and case fatality of those infections. Nutritional status is usually defined by simple anthropometry, which may encompass a spectrum of micro- and macronutrient deficiencies and socioeconomic disadvantage. Mechanisms underlying infection and an increased risk of infection include disrupted mucosal barrier functions, dysregulated inflammation, and functional innate and adaptive immunity.

Among children hospitalised with severe pneumonia, undernutrition is associated with an increased risk of treatment failure at 48 hours and 5 days, and a 10 to 15-fold increased risk of mortality. Often unobserved, is the fact that many children in developing countries also die shortly after discharge from hospital. Post-discharge mortality is 2.5-fold greater among children with pneumonia than among children admitted for other conditions and is strongly associated with both moderate and severe undernutrition. Potential pathways to mortality include impaired metabolism to support, for example, energy requirements of increased work of breathing, bacterial rather than viral aetiology, and undiagnosed or under-treated infections due to antimicrobial resistance or TB. However, admission with severe pneumonia also indicates children with an unstable health trajectory, exposure to pathogens, inadequate diet and social disadvantage who are at longer-term risk.

To further reduce mortality associated pneumonia, interventions can be more targeted through better understanding of acute metabolic care, algorithms to select, identify and treat covert infections, and addressing access and socio-economic risks are needed.
Hepatitis B virus and hepatitis C virus (HCV) infection are major causes of acute and chronic liver disease globally and associated morbidity and mortality. The fight against chronic viral hepatitis has reached important milestones both in prevention and treatment. For hepatitis B, although infant immunization has achieved the highest goal reducing new infections, effective long-term antiviral treatment is available for children with chronic infection. Eight antiviral agents, 3 nucleoside analogues (entecavir, lamivudine and telbivudine), 3 nucleotide analogues (adefovir dipivoxil, tenofovir disoproxil and alafenamide), standard interferon (IFN) and pegylated PEG IFN α-2a are approved for treatment of chronic hepatitis B in children. For hepatitis C, the recent development of highly effective, well-tolerated oral anti-HCV treatment regimens with high rates of cure after 12 weeks of treatment has revolutionized the treatment of chronic infections. Recently, the fixed-dose combination of ledipasvir/sofosbuvir and the combination of sofosbuvir and ribavirin have been approved by the US Food and Drug Administration and by the European Medicines Agency for the treatment of children older than 12 years and weighing more than 35 Kg with chronic hepatitis C. PEG IFN α-2a or α-2b and ribavirin is still the standard of care for younger children.

A comprehensive overview of the current available therapies for chronic hepatitis B and C in children will be provided together with a critical review of the current guidelines and indications for treatment provided by the major international societies and by consensus of expert panels.
In 2013 diarrhea accounted for 9% of the 6.3 million under-5 child deaths globally, and rotavirus was responsible for an estimated 215,000 deaths. Approximately 40% of diarrhea hospitalisations worldwide are due to rotavirus. Despite the availability of two World Health Organization (WHO) pre-qualified rotavirus vaccines since 2006 and WHO recommendations of 2009 and 2013 that these vaccines should be included in all National Immunisation Programs, only 81 (42%) of the 194 WHO member states had done so by December 2016. Few of these introductions were in the Asian region. India started a phased introduction of its indigenous rotavirus vaccines in 2016 and other new vaccines are in the pipeline. A recent review of countries that had introduced rotavirus vaccines showed that countries with high and medium child mortality witnessed a 42% reduction in diarrhea deaths. Hospitalizations and emergency department visits due to rotavirus gastroenteritis were reduced by a median of 67% overall in the 27 countries of all income groups included in this review. In low-income countries, children are 8.5 times more likely to die in the 2 months following a diarrhea hospital admission and are more likely to have their growth stunted. In some high-income countries, unexpected benefits of rotavirus vaccination have been observed, with reductions in both febrile and afebrile seizures, that result in significant cost-savings to the health care system. Herd protection effects have also been noted. Despite these benefits and despite availability of comprehensive local rotavirus disease burden data in the Asian region, many decision-makers have yet to be convinced of the value of universal rotavirus vaccination. Uncertainty about vaccine price may be a contributing factor to this slow uptake of rotavirus vaccine. WHO’s Vaccine Product, Price and Procurement (V3P) Web Platform aims to increase transparency and help countries negotiate with industry cost-effective prices. In the longer term, WHO pre-qualification of the new rotavirus vaccines should have a positive impact on prices and consequently increase the introduction of these vaccines into National Immunization Programs in the Asian region.
Malaysia is the first country in Asia to introduce HPV in their national immunization program sometime in mid-2010. This is considered an important milestone as many other countries in Asia and elsewhere in the world are enabling its inclusion in the NIP. Another country introducing HPV is Bhutan and others like Bangladesh, Nepal and Thailand have done pilot implementation and still others like India and Philippines have introduced HPV on a regional or community basis. Other countries like Sri Lanka are planning to introduce it soon. It was in 2009 when WHO recommended HPV to be included in the NIP. In 2016, a comprehensive guide on the HPV introduction was also published by WHO which discussed the various aspects and issues needed for a successful implementation. Among these are: 1). Decision-Making Process, 2). Planning Strategies, 3). Vaccine Management, 4). Microplanning and Determining the Target Population, 5). Communication and Social Mobilization, 6). Implementation including Training, Service Delivery and Supervision and 7). Monitoring and Evaluation. Although these processes are considered universal for introducing a new vaccine in the NIP, the fact that Asia has very diverse cultural, social, religious and behavioral characteristics make up for distinctly varied and different approaches to the introduction of HPV. It would be important to understand these issues and determine what works best for each Asian country planning to introduce the vaccine. Innovations, substantial and sustained hardwork, political will and adequate financial resources will all be needed to increase the number of Asian countries introducing HPV in the NIP.
Zika virus (ZIKV) is one member of the Family Flaviviridae, Genus Flavivirus, transmitted by Aedes mosquitoes. This virus was first isolated from a rhesus monkey in Zika forest, Uganda on 1947 but first human infection were diagnosed on 1952 in Uganda and Tanzania. Only 13 sporadic cases of ZIKV infection were subsequently reported from Africa and Asia until 2007 the first small outbreak occurred in Yap Island, the Pacific Ocean. Results from Yap’s outbreak, 74% of population age more than 3 years developed Zika IgM with only 18% had symptomatic illness. On 2015-2016, the largest outbreak occurred in South, Central and North America. Brazil had the greatest impact by ZIKV infection and their serious complications, an estimated 440,000-1,300,000 cases of Zika fever while only few reports case from Africa and Asia around this time. In 2017, incidence of ZIKV infection in the Americas is dramatically decreasing among most countries with unexplained reason.

ZIKV infection epidemiology and disease burden in Asia is not known and poorly understood but it has been present in the region at least few decades ago. From 2010 onward, there were reported cases from many countries in Southeast Asia such as Cambodia, The Philippines, Thailand, Indonesia, Malaysia which mostly confirmed diagnosis from travelers when trip back to their home countries. The detection of Zika illness in traveler from Zika non-endemic country suggest the possibility that substantial transmission has been occurring in many Asian countries for certain period of time. With increased public health awareness after the American epidemic on 2015, epidemiological surveillance including Zika testing in many Asian countries began to report Zika case in 2016. Two countries had reported substantial number of confirmed Zika cases as follow: Thailand (January- November 2016) had reported 686 cases including the first 2 cases of confirmed Zika related microcephaly in Asia; Singapore (August - November 2016) had reported 455 cases within 15 disease cluster and only 38 case reported from January – June 2017. The rest of Asian countries had reported only few confirmed Zika cases which may reflex the complexity in diagnosis and intensity of surveillance system among these country.

Lesson – learned from the Americans outbreak (on 2015-2017) will be great benefit in preparing the preparedness plan for Asian countries. Increased disease awareness, surveillance system among pregnant women, increase capacity of laboratory diagnosis are the main goal to develop and implement appropriate strategies for prevention and control of ZIKV infection in the region.

Conclusion: ZIKV infection is one of most important international public health threat especially Dengue endemic area including Asia. Preparation of surveillance and diagnosis of ZIKV infection among pregnant women, newborn with suspected congenital Zika disease and GBS will help to solve and forecast this problem. The biomedical and clinical research are essential for better understanding of new knowledge in providing the appropriate strategies for prevention, especially vaccine, and treatment of this disease in the future.
Pneumococcal disease remains a leading vaccine-preventable cause of childhood mortality. As of August 2017, pneumococcal conjugate vaccine (PCV) had been introduced in 141 countries, including 58 of 73 Gavi-eligible countries. The sustainability of PCV vaccination, particularly in low-income countries, will depend on the demonstrable effectiveness of PCV in reducing childhood morbidity and mortality. In general, how well PCV performs in any country depends on the distribution of serotypes causing disease prior to vaccination, the uptake of vaccine in targeted age groups, the use of catch-up campaigns, and the prevalence of risk factors for disease. In 2012, the WHO published recommendations for measuring the impact of PCVs in national immunization programs. This session will highlight outcomes (e.g., invasive disease, hospitalization, carriage) used in PCV impact evaluation studies, discuss the strengths and limitations of methods for measuring impact and provide a framework for determining the most appropriate impact evaluation strategies for various settings.
Finding out whether the national health benefits of a newly introduced childhood vaccine are actually meeting expectations is an essential task. For example, pneumococcal conjugate vaccines (PCVs) are expected to make a substantial dent in global childhood respiratory mortality. But the severe outcomes of greatest interest -- such as sepsis, meningitis and death -- are too rare to be studied in pre-licensure randomized trials. Therefore, vaccines are evaluated after introduction in “phase IV” studies that look for reductions in key health outcomes over time as vaccine coverage increases. But establishing that the vaccine in fact caused the reductions is challenging, because trends studies are subject to bias and confounding, which can lead to either overly optimistic or pessimistic assessments of vaccine programs. To confuse matters further, clinical outcomes differ in specificity and vaccine effectiveness estimates therefore vary. I will discuss such real-life challenges, focusing on the important case of pneumococcal conjugal vaccines (PCVs) and the century-long quest to prevent death in early childhood.
The influenza virus circulates yearly and causes global epidemics. Influenza infection affects all age-groups and causes mild to severe illness, with young infants being at particular risk for serious disease. The most effective measure to prevent influenza disease is vaccination, however, none are licensed for use in infants <6 months old. Thus, the crucial need for other preventive strategies in this high-risk age-group. Influenza vaccination during pregnancy protects both the mothers and the young infants against influenza infection. Vaccination during pregnancy boosts the maternal antibodies and increases the transfer of immunoglobulins-G from the mother to the fetus through the placenta, which confer protection against infection in infants too young to be vaccinated. Data from clinical trials and observational studies did not demonstrate adverse effects to the mother, the fetus or the infant after maternal influenza vaccination. We present the current data on the field of maternal influenza vaccination aiming at preventing disease in the young infant and the mothers.
The human immune system is incredibly heterogenic, involving regulated communication and coordination between many different cells, tissues and organs. The generation of immunological memory is driven by early innate immune processes. In a natural infection, antigen presenting cells are activated in response to pathogen-associated molecular patterns and/or endogenous ‘danger’ signals. During vaccination, these signals are provided in the form of adjuvants and/or specific ligands present in vaccines. Ideally, through these complex processes vaccination leads to 1. the generation of antibodies that can prevent or limit infection and/or disease and 2. the differentiation and maintenance of antigen-specific memory immune cells that can respond quickly and adequately to re-encounter with the same antigen, thus limiting infection.

Differences in host genetics and the environment introduce significant variation into how humans respond to vaccination, with some subjects responding very well whilst others respond poorly. Through ‘omics’ approaches, systems vaccinology harnesses these inter-individual differences to gain insight into vaccine responsiveness. In most studies thus far, blood has been the biological specimen of choice to identify systems-wide changes in the response to vaccination. This is partly because blood is relatively easy to obtain and it contains a number of different migrating immune cells and cellular states. Ideally, clinical endpoints are then used to filter out those patterns or individual immune factors that are associated with clinical protection - or the lack thereof. However, because disease endpoints typically require very large and costly clinical trials and close follow-up of case-controls, most studies to date have opted for pathogen-specific immunological correlates of protection as substitute endpoints.

Although systems vaccinology in children has a huge potential to change our way of thinking on how immunity is programmed early in life, there are several key challenges that need to be addressed. These include the frequent use of combination vaccines and/or simultaneous administration of other vaccines, but also major changes in the developing immune system in children in their first year of life. Furthermore, limitations in blood volume and the frequency of blood draws have to be addressed through innovative trial design, as dynamic sampling in infants is not trivial. Ultimately, systems vaccinology not only has the potential to provide mechanistic insights into vaccine responsiveness and inform the design of novel safe and effective vaccines, but it can also be a powerful tool to optimize entire immunization programs.
TB was one of the top 10 causes of death worldwide in 2015. According to the 2016 WHO Global TB Report an estimated 10.4 million TB cases were detected of which 5.9 million were males and 3.5 million were females. 10% of cases were children. People living with HIV accounted for 1.2 million (11%) of all new TB cases. Six countries (India, Indonesia, China, Nigeria, Pakistan and South Africa) accounted for 60% of the global total. In the WHO SEAR an estimated 4.74 million cases of TB were reported and about 784000 people died of it. Of these India (23%) and Indonesia (10%) alone account for a third of the world’s burden.

In SEAR the updated estimate of incidence (new TB cases per year) in 2015 is 246 per 100 000 population & mortality rate is 37 / 100 000 population.

Globally, an estimated 250 000 people died of DR-TB in 2015. The number of MDR-TB cases detected worldwide represented only 37% of the estimated 340 000 MDR/RR-TB cases among pulmonary TB patients reported and only 21.5% of the MDR-TB incidence cases. In SEAR, the estimated incidence of MDR/RR-TB was 200 000, with India alone accounting for 130 000.

In 2015, 1.8 million people died from TB*, including 0.4 million among people with HIV globally. The estimated incidence in INDIA is 2.8 million cases in 2015 per 100000 population with estimated mortality of 4.8 lakhs.
WSPD7-1292
WSPID SYMPOSIUM
WSPID SYMPOSIUM 8: EPIDEMIOLOGY, DIAGNOSIS AND TREATMENT OF CHILDHOOD TUBERCULOSIS

TREATMENT OF MDR-TB IN CHILDREN
M. Cotton
South Africa

MDR-TB, encompassing resistance to the 2 most important 1st line agents isoniazid and rifampicin, is emerging as problem of major public health significance. Globally, 5% of persons with TB (480,000 cases) were estimated to have MDR-TB. Most cases are adults and many of those exposed are children at high risk for progression from infection to disease.

Diagnosis

TB disease in children is often paucibacillary, with infants and young children unable to cough on demand. Nevertheless, in the era of MDR TB it is essential that in all children suspected of having TB every effort is made to identify Mycobacterium tuberculosis (M.tb) from available clinically relevant sources. The most common source is respiratory secretions. Others include lymph node, stool cerebrospinal fluid, otorrhoea and cerebrospinal fluid. With the advent of the molecular techniques such as the Xpert MTB/RIF molecular test that identifies both M.tb and rifampicin resistance within 2 hours using an automated cartridge system. Line probe assays can be applied to positive cultures and primary sources for other anti-TB medicines.

For children without their own M.tb isolates, treatment can be adapted to that of the most likely source case. If the latter is unknown, MDR TB can be suspected if the source case is failing 1st line TB treatment, is on a retreatment regimen or has died.

Treatment

Where possible, treatment should take place in specialized clinics which emphasise careful follow-up and attempt to solve social and medication-related barriers to adherence. Directly observed therapy is essential. As 2nd-line medicines are more toxic and less tolerable than 1st-line regimens, one must be aware of toxicity for example ototoxicity related to aminoglycosides and hypothyroidism for para-aminosalicylic acid and ethionamide. MDR therapy should include at least 4 active drugs. New drugs such as bedaquiline and delaminid have emerged and are already approved for adults, with pharmacokinetic studies in children either in progress or in advanced planning.

Prevention

TB disease risk among contacts exposed to MDR-TB is considerable. In a meta-analysis (25 studies), 7.8% of household contacts of MDR-TB patients developed TB. There is growing evidence that post-exposure prophylaxis is worthwhile. At least one prospective randomized study has commenced for children, with a large household study to commence in 2018.
Reference
National immunization programmes have become acutely aware of the potential damage and threat vaccine hesitancy, public mistrust of vaccines and immunization services, or the outright rejection of vaccines or the services that provide them, pose. A lack of acceptance of vaccination, affects vaccine uptake, heightens the likelihood of disease transmission and amplifies outbreaks.

Vaccine hesitancy includes factors such as complacency, convenience and confidence – each of which are exhibited at parent/patient, pediatrician/provider and decision-making levels, to varying degree in different contexts.

This talk will:
- reflect on the impact of vaccine hesitancy and sub-optimal demand on immunization programme performance,
- share methods to measure, how, where and why vaccine hesitancy manifests itself, and
- consider the role pediatricians/providers can play in counteracting and addressing it.


PREVENTION OF NEONATAL INFECTIONS BY GROUP B STREPTOCOCCI

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Streptococcus agalactiae (group B streptococcus (GBS)) is the leading cause of early-onset neonatal infections and neonatal meningitis in many countries. Intrapartum antibiotic strategies have reduced the incidence of early-onset neonatal GBS in a number of settings but have had no impact on late-onset GBS (LOD). In low/middle income settings, the disease burden remains uncertain although in several countries of Southern Africa appears comparable to or higher than that of high-income countries. As disease may be rapidly fulminating cases can be missed before appropriate samples are obtained and this may lead to underestimation of the true burden. Given the rapid onset and progression within hours of birth as well as the deficiencies in IAP strategies and absence of a solution for preventing LOD, it is clear that administration of a suitable vaccine in pregnancy could provide a better solution in all settings; it should also be cost effective. The current leading vaccine candidates are CPS-protein conjugate vaccines and many trials, including in pregnancy, have been undertaken. Protein-based vaccines are also in development and one candidate is now in clinical trials. There are now a number of reasons for great optimism in this field, including a better definition of the global burden of disease, the acceptance of the pregnancy platform for vaccination, the development of a GBS vaccine development technology roadmap by WHO (including a priority action framework and preferred product characteristics) and by the active engagement of Industry. The pathway to licensure remains unclear; however, one viable option is to gather robust data on serological correlates of protection in order to facilitate licensure without the need for large-scale pre-licensure efficacy trials in pregnant women - coupled with enhanced post-implementation surveillance to address effectiveness and safety.
MERS - FROM MIDDLE EAST TO THE EAST AND BEYOND

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MERS: from Middle East to the East and beyond

Since its first appearance in 2012, MERS has affected >25 countries in four continents with >2,000 cases and a high fatality rate of >30%. A novel lineage C betacoronavirus, MERS coronavirus (MERS-CoV), has been confirmed to be the etiological agent. Human dipeptidyl peptidase 4 was found to be the cellular receptor for MERS-CoV. Subsequent detection of MERS-CoV and its antibodies in dromedaries in various countries in the Middle East and North Africa have implied that these animals are probably the reservoir for MERS-CoV. Other lineage C betacoronaviruses in bats (e.g. Tylonycteris bat CoV HKU4, Pipistrellus bat CoV HKU5) and hedgehogs were found to be closely related to MERS-CoV. So far, detection of MERS-CoV and discoveries of its closely related CoVs are most efficiently achieved through RT-PCR. Although RT-PCR is highly sensitive, its turn-around-time is about four hours and the test requires expensive equipment, stringent laboratory set-up and personal attention to prevent laboratory PCR product cross contamination which may lead to false-positive results. Recently, we have developed a monoclonal antibody-based rapid nucleocapsid protein detection assay for on-site diagnosis of MERS-CoV, which can be finished in 30 minutes. In addition to human and camel samples, we examined the usefulness of this rapid assay to detect other lineage C betacoronaviruses closely related to MERS-CoV in bats. The rapid MERS-CoV nucleocapsid protein detection assay was tested positive in 24 (88.9%) of 27 Tylonycteris bat CoV HKU4 RNA-positive alimentary samples of Tylonycteris pachypus and 4 (19.0%) of 21 Pipistrellus bat CoV HKU5 RNA-positive alimentary samples of Pipistrellus abramus. The rapid assay was tested negative in all 51 alimentary samples RNA-positive for alphacoronaviruses (Rhinolophus bat CoV HKU2, Myotis bat CoV HKU6, Miniopterus bat CoV HKU8 and Hipposideros bat CoV HKU10) and 32 alimentary samples positive for lineage B (SARS-related Rhinolophus bat CoV HKU3) and lineage D (Rousettus bat CoV HKU9) betacoronaviruses. This rapid assay will facilitate rapid on-site diagnosis of MERS and rapid on-site screening of animal samples for ancestors of MERS-CoV and tracking transmission in the related bat species from the Middle East to the East and beyond.
As one of the most common types of viruses that can cause the hand, foot and mouth disease HFMD, EV71 has the highest level of virulence, followed by poliovirus. In 1995, the Wuhan virus institute first isolated EV71 from patients with HFMD in China mainland. From 1999 to 2007, HFMD cases caused by EV71 were mainly distributed sporadically in southern China. In March of 2008, the outbreak of EV71 infection in Fuyang, Anhui province drew great attention of the society. From March to May 2008, a total of 6,049 HFMD cases were reported from local healthcare facility in Fuyang city, and 90% of the cases were associated with EV71. Periodical fatality was high up to 84.2%. There have been large scaled outbreaks of HFMD in a large area of China from 2008, posing a serious threat to public health and children's well-being in China. In order to cope with the chaos of diagnosis and treatment of hand foot and mouth disease, the Ministry of Health (MOH) defined HFMD as category C communicable disease on May 3, 2008. Guidelines and expert consensus of HFMD or EV71 infection were published, including Guidelines for Diagnosis and Treatment of HFMD (2008 edition), Guidelines for Diagnosis and Treatment of HFMD (2011 edition), HFMD Clinical Treatment Expert Consensus (2011 edition). The guideline categorized the patients into mild and severe cases, outlined the diagnostic criteria, and standardized the protocol of treatment for mild and severe cases. The guideline also provided early warning indicators for severe cases. In addition, the guideline regulated the use of corticosteroids, intravenous gamma globulin, vasoactive drugs, and mechanical ventilation in the treatment of pulmonary hemorrhage. National clinical expert group was established by MOH in 2008. The MOH sent many medical teams to epidemic areas. They worked with the local staff together, even on call day and night, greatly improved the level of critical care in the local hospitals. National CDC helped the local CDC to establish their own laboratories, and rapid virology test are available in local hospitals. The outbreak of EV71 infection has impact on the development of pediatric intensive care medicine. The government and public realized the importance of PICU after the prevalence of HFMD. Many new PICUs were established in China mainland in recent years, and the capabilities of early recognition and treatment of critical cases were improved. Hand, foot and mouth disease is still the leading infectious disease among children in China. In recent 5 years, CDC reported an average annual incidence of more than 2 million cases, but the mortality rate has dropped from 0.26 per thousand in 2008 to 0.08 per thousand in 2016. Furthermore, the mortality rate of severe hand foot and mouth disease fell from 39.5% in 2008 to 2.46% in 2013. The EV71 vaccine has been brought to market successfully in 2016, and the use of the vaccine is expected to effectively control the prevalence of hand foot and mouth disease caused by EV71 infection in mainland China.
Inappropriate use of antibiotics is of special concern globally. Nevertheless, antibiotic overuse in children remains common. This presentation summarizes data regarding antibiotic use in children in China over the recent 10 years. In October 2004, the Chinese Ministry of Health officially issued Guidelines for antibacterial use for clinical practice. The Anatomical Therapeutical Chemical Classification/Defined Daily Doses (ATC/DDD) and the drug utilisation 90% (DU90%) methodologies were used to investigate the pattern of antibiotic use in five Chinese children's hospitals from 2002 to 2006. The decline in antibiotic usage of inpatients in 2006 and the overall use of outpatient antibiotics in some hospitals found may be attributed to the impact of the guidelines. However, over the span of five years, there was a decrease in the use of narrow spectrum antibiotics and an increase in broad spectrum antibiotics.

As the members of Global Antimicrobial Resistance, Prescribing, and Efficacy Among Neonates and Children (GARPEC), more than 10 children hospitals in China participated in the point prevalence survey (PPS) during 2015-2016. Simple web-based PPS tools were used to collect data regarding antibiotic use in hospitalized neonates and children worldwide. This survey reported a total antibiotic use rate of about 60% in Chinese children. In 2012, Management of antibacterial use in clinical practice (No.84 order of the Ministry of Health) issued and demand the rate of antibiotic use as an evaluation indicator and that less than 60% of inpatients in children hospitals. Although the rate seems near the demand, the rates in several hospitals are higher than 80%. Overuse of third-generation of cephalosporins were found in both neonates and children. Moreover, the long-term impact of the guidelines on the rational use of antibiotics requires further assessment.

Antibiotic use in Chinese children is affected by several factors, including guidelines, prescriber training, infectious disease prevention, patient self-medication, etc.

Now the antimicrobial resistance is the big threat all over the world, there is close relation between antibiotic therapy and resistance. The resistance rate to erythromycin among Streptococcus pneumoniae solates from children exceeded 90%. The frequency of resistance to β-lactam antibiotics increased rapidly in recent years. This pattern was consistent with the increase in second- and third-generation cephalosporin use. Antibiotic stewardship programs should identify the feasible, useful, detailed targets to monitor and intervene to prevent antibiotic resistance in children to be worsen.
THE ELIMINATION OF HOSPITAL-ACQUIRED INFECTION: A REALISTIC GOAL?

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Healthcare associated infections are a worldwide plague. Since the landmark Institute of Medicine Report of more than a decade ago, the public, patients and clinicians across the board are more aware of the serious consequences of healthcare acquired infections in terms of mortality and morbidity. There have been major advances in the prevention of healthcare acquired infection from the use of safety devices, closed systems, checklists, bundles and a host of other innovations. However, patients are more and more immunocompromised and are subjected to increasingly complex devices which make control of healthcare associated infection even more challenging. There has been a movement in recent years based on industry’s zero defect approach to try to eliminate healthcare associated infections. While this is a worthwhile goal, I believe that it should not overwhelm good science, evidence based medicine and the investment in people and infrastructure needed to provide safer care for our patients.
While many endemic infectious diseases of humans have been largely contained, new or antibiotic resistant microbes continue to emerge to threaten human health. Over 2/3rd of novel emerging pathogens are zoonotic in origin and many are caused by RNA viruses. In addition to their impact on human health, these emerging pathogens often have huge economic, social, and sometimes political impact, examples being SARS (estimated global impact US$42 billion) and highly pathogenic avian influenza H5N1 (global impact US$20 billion up to 2009). Many of these have arisen in Asia, others (e.g. swine pandemic H1N1 2009) arose elsewhere but spread very rapidly within Asia, and yet others (e.g. Ebola) have caused great concern because of the threat of introduction via international travel. Early detection and response is crucial for effective disease containment or mitigation. The clinician alert for unusual disease clusters or presentations is crucial for early recognition and investigation of such events. Molecular diagnostics, and more recently, Next Gen “deep-sequencing”, provides greatly enhanced speed and capability for detection of novel pathogens but it is crucial that “classical” microbiological expertise (e.g. viral culture, electron microscopy) is not lost - Nipah, SARS and MERS all being identified by virus culture. Rapid and early assessment of the transmission dynamics and disease severity is important for policy making and calibrated responses; the global response to the 2009 H1N1 pandemic being a case in point. Identification of the proximate sources of zoonotic infection provides actionable interventions to reduce risk. For example, research on the transmission dynamics of avian influenza viruses within the live poultry marketing chain in Hong Kong provided evidence based options for control of zoonotic disease caused by H5N1 and H7N9 avian influenza viruses. Understanding the ecological drivers of virus emergence helps us to identify rational interventions to prevent emergence at source. The concept of “One Health” is now recognized to highlight the inextricable links among the health of humans, animals and the ecosystems we inhabit. As many emerging virus infections arise from animal reservoirs, a “One Health” approach is essential to their containment so that human health benefits are optimized while maintaining food security, safeguarding the economics of animal husbandry, preserving the environment and remaining sensitive to cultural practices.
Dengue is responsible for 390 million infections with 10 million hospitalizations, 13,500 deaths, 9 billion USD in health care expenditures yearly. Control of the vector mosquito and a safe/efficacious dengue vaccine are critical in order to effectively control this rapidly spreading disease. Ideal dengue vaccine should be safe, single shot against 4 dengue serotypes and long lasting, non-transmission, easy to administer/distribute, cheap. Currently, 6 different vaccine approaches have been tested in human clinical trials, and a single candidate vaccine has registered in 18 countries and also implemented in the public program in 2 countries.

The challenges for clinical trials and introduction of dengue vaccine are poor understanding of surrogate endpoints, neutralizing antibody may not correlate with protective efficacy, co-circulation of multi-serotypes with unpredictable predominance at different time point, gap in understanding the viral pathogenesis, lack of a reliable animal model, complexity of host immunological mechanisms and developing the vaccine against 4 serotypes, and the potential to induce antibody dependent enhancement.

Generation and license of a safe and effective tetravalent dengue vaccine is only the first obstacle toward full implementation in a public health setting. To implement dengue vaccine, a country should appraise the evidence of the vaccine for cost effectiveness, efficacy, safety, likelihood that it will improve the public health. There are some challenges for the vaccine implementation in Asia. The vaccine should have high efficacy against all 4 serotypes and long lasting, good efficacy for target group of vaccination and also for seronegative/seropositive individuals, rare long-term adverse events, and high protective efficacy to confer herd-immunity. Finally, dengue risk is highly variable between and within countries thus the priority for using vaccine will vary accordingly, and dengue vaccine implementation should be a part of a dengue control strategy and robust surveillance system.
Congenital cytomegalovirus (cCMV) infection is a leading cause of disabilities such as sensorineural hearing loss (SNHL); however, very few women realize its clinical burden on their fetuses, and even fewer are aware that good personal hygiene can reduce viral transmission. Few pediatricians and even fewer obstetricians recognize that early therapeutic intervention with valganciclovir has been shown to improve prognosis of symptomatic cCMV. Accordingly, few infants are given such a therapeutic option.

Since 2013, a research team consisting of obstetricians, pediatricians, and microbiologists who specialize in congenital infections has been working on a task to make countermeasures against congenital toxoplasmosis and cCMV under the supervision of the Ministry of Health, Labor and Welfare in Japan. As regards cCMV, there are four main pillars that support this project:

1) A prospective study on premarket approval of an *in vitro* diagnostics (IVD) product for nucleic acid examinations: Urine samples are collected from CMV-infected, high-risk and control infants to evaluate its reliability.

2) A prospective study on establishment of IVD products for IgG avidity tests: Serial serum samples are collected from CMV-infected pregnant women to evaluate them.

3) A diagnostic service for and establishment of a registry system of those with cCMV: Until the abovementioned diagnostic tests are available in clinical sites, a service of real-time PCR for infants suspected of cCMV is provided. The registry system is used for preparation of a clinical study on antiviral therapy.

4) Awarenessraising activities: Brochures and posters are distributed to medical professionals or through the internet.

We also took additional strategies against cCMV in Nagasaki prefecture, Japan.

1) Serological screening of pregnant women: They are tested for CMV-IgG around 12 weeks of gestation. CMV-IgG negative women are reinforced for their awareness to prevent infection, and recommended to take another antibody test at late gestational period. Infants born to those who seroconverted during pregnancy are referred to us for targeted neonatal cCMV screening as below.
2) Targeted neonatal cCMV screening: We have targeted three groups of neonates for cCMV screening: (1) those born to mothers who seroconverted during pregnancy, (2) light-for-date infants, and (3) those who failed neonatal hearing screening in any one ear or both. Their urine samples are collected and subjected to real-time PCR for detecting CMV DNA.

3) Antiviral therapy: Infants with symptomatic cCMV, including those with SNHL or profound intrauterine growth retardation, are considered candidates for anti-CMV therapy. After informed consent, they are given a 6-month course of valganciclovir under close monitoring of adverse reactions, viral load measurement, and therapeutic drug monitoring.

We believe the aforementioned nation-wide or prefecture-wide multidirectional strategies against cCMV are effective for prevention, early diagnosis and therapeutic intervention, but there are many challenges that are still to be overcome.
Dengue is a vector borne disease that has grown to global prominence over the course of the last 50 years. Despite this growing recognition, dengue cases are often asymptomatic or difficult to diagnose leading to gaps in surveillance. These gaps mean many of the fundamental measures of a disease such as where it is and how many people it affects? remain uncertain.

Modern disease mapping and statistical burden estimation techniques are beginning to change this, with new approaches suggesting 50-100 million symptomatic dengue infections occur in over 120 countries worldwide each year. Since 1990 the number of deaths has also increased by almost 50% with nearly 12,000 deaths in the year 2015.

In addition to global efforts, there is a new push for countries to re-evaluate their own national burden through the development of the WHO burden estimation toolkit. This process uses combines data from a variety of sources and attempts to identify why reported case numbers may not match modelled estimates, and in doing so identify how dengue surveillance could be improved.

Such methods are also now being extended to answer the complex question of what the future distribution and burden of dengue will look like? Climatological factors are certain to play a role, but many mapping methods are now extending their approach to include urbanisation, spread of the vectors and connectivity of human populations; all features that have been fundamental to dengue’s rapid recent global spread.
Dengue is a mosquito-borne disease caused by dengue virus (DENV-1 to 4). It is a growing global public health problem associated with substantial morbidity, including social and economic costs in the tropic and subtropical regions. The major burden of dengue epidemics is not only the number of deaths but also number of hospitalizations and days of illness. Mosquito control, by chemical or biological agents for many years have had little success in eliminating or stopping the spread of dengue virus globally. Effective dengue vaccines, probably will be the essential measure to achieving dengue disease control.

In vaccine development, the vaccine should ideally induce both humoral (neutralizing antibodies) and cellular immunity. Live attenuated vaccines (LAVs) should be optimal for these concepts. It should be suitable for use in children and provide immune responses that do not increase the risk of DHF or severe dengue illness from subsequent exposure to wild-type virus.

In December, 2015, a live-attenuated, chimeric yellow fever dengue – tetravalent dengue vaccine, (CYD-TDV) by Sanofi Pasteur the first dengue vaccine licensed for use in individuals aged 9–45 years in many endemic countries. The 3-dose regimen of CYD-TDV induces neutralizing antibodies against all 4 dengue virus serotypes, as measured by PRNT50. Vaccine efficacy among children age 9-16 years old during the 25-month after the first dose in the pooled analysis of 2 phase III clinical trials was 65.6% (95% CI, 60.7–69.9) against virologically confirmed dengue (VCD) of any severity owing to all serotypes, 80.8% (95% CI, 70.1–87.7) against hospitalization and 93.2% (95% CI, 77.3–98.0) against severe dengue disease. There were no safety issue when comparing the vaccine and placebo group in almost 30000 subjects of both study. The long term follow up of safety and efficacy in phase III in Asia and Latin America study was planned for 5 years after completion of the vaccination schedule which suggested by WHO guidelines.

Beside from CYD-TDV, several dengue vaccine candidates such as other live attenuated, inactivated, recombinant subunit and DNA vaccine are in different developing stages. Two live attenuated vaccines candidates [rDENV Delta30] -NIAID candidate and 2.DEN-2 PDK53 backbone with DENV1, 3 and 4 prM and E gene chimera -Takeda candidate] are the recent advancement in clinical trial phase III in Asian and South American countries.

**Conclusion:** Continuing efforts in dengue vaccine development are critical to address the growing burden of dengue worldwide. A safe, effective and affordable dengue vaccine would represent a major advance for the control of the disease and could be an important tool for reaching the WHO goal of reducing dengue morbidity by at least 25% and mortality by at least 50% by2020. So, the development of second generation of all types dengue vaccine is needed to provide a most ideal safety and good protection for all populations whom are at risk.
Poliomyelitis is on the verge of eradication with 7 cases of paralytic disease caused by wild poliovirus type 1 reported in Jan-Jul 2017 from the last three poliovirus endemic countries (Afghanistan, Pakistan and Nigeria). Indigenous wild poliovirus type 2 was last detected in Northern India in 1999 and is considered eradicated, and wild type 3 poliovirus was last reported from Nigeria in November 2012.

Sabin-derived polioviruses can replicate for prolonged periods and potentially re-establish endemic and epidemic transmission, and outbreaks of vaccine derived polioviruses (VDPV) have been detected and responded to. Therefore, strategies for the elimination of all polioviruses, including the attenuated Sabin vaccine viruses emanating from the oral polioivirus vaccine (OPV), were developed and implemented to achieve polio eradication. The Polio Eradication & Endgame Strategic Plan 2013-2018 lays out a roadmap to interrupt the transmission of wild polioivirus as well as to achieve the long-term goals of the post-eradication era. The four over-arching objectives of the plan are: (1) to interrupt wild polioivirus transmission, (2) to strengthen immunization systems and the withdrawal of OPV, (3) to implement containment of polioviruses and to certify the world as polio-free, and (4) to plan the legacy of polio eradication.

The main challenges to polioivirus eradication remain security compromised areas in the core reservoirs. In all three endemic areas, severe security restrictions limit access for vaccinators as well as for surveillance medical officers to carry out polioivirus surveillance. This is especially true in northern Nigeria where undetected circulation of polioviruses is likely ongoing.
The development of high throughput microarray and sequencing methods that enable genome wide analysis of the host transcriptomic response to infection and inflammation, has provided the paediatric research community with powerful new methods to study infectious disease. RNA expression profiling is ideally suited to application in paediatrics, as very small volumes of blood can be used to simultaneously measure the expression of all known genes.

In the past decade RNA expression analysis has been applied to studies on malaria, tuberculosis, viral and bacterial infections and inflammatory diseases. Development if bioinformatics methods have enabled identification of diagnostic signatures based on the expression patterns of small numbers of gene transcripts.

This talk will review the progress made in developing new methods for diagnosis of childhood infection, focusing on distinguishing TB from other diseases and distinguishing bacterial infection from viral and inflammatory diseases using small RNA signatures. The potential for development of a rapid test suitable for use in resource limited settings will be discussed.
Clinical manifestations of respiratory virus infections are usually non-specific, with significant overlap between viral, bacterial, and non-infectious causes. Molecular techniques are now the preferred diagnostic approaches for the detection and identification of acute respiratory viruses, which are more amenable to automation and high throughput workflows. The decreasing complexity of platforms used for molecular testing has expanded the geographic capacity of these assays to Asia, which can now be placed closer to patients as point-of-care tests. Development of new technologies, with improved multiplexing capabilities, has allowed detection and differentiation of multiple virus targets from a single respiratory sample that have facilitated identification of mixed viral infections. Both random-access and batched testing platforms may be needed. For a laboratory handling low to medium specimen volumes, the random-access platform is suggested to take advantage of features of simple workflow and rapid turnaround time. The batched testing platform is useful for unexpected increases in testing volume such as burdensome nosocomial outbreaks, influenza seasons, and pandemics.
Bacterial infections can have devastating effects on human health and range in severity from relatively innocent to deeply invasive and life-threatening. Classically, bacterial infections were detected by culture-based technologies, a practice that still governs many of the investigations performed by the clinical microbiology laboratory. Although culture is generally being considered as a relatively insensitive method that also takes extended incubation times, there have been significant improvements in culture technology over the past decades with one of the important highlights being miniaturization, automation and the development of so-called culturomics. In addition, the quality of growth media and with that the time to positivity has significantly profited from the various “omics” technologies. Proteomics and MALDI ToF MS, for example, have had a major and intense influence on modern laboratory procedures associated with cultivation. Overall, these improvement covered both bacterial detection and identification, but also more detailed characterization including antibiotic susceptibility testing (AST).

Next to the classical approaches a variety of new ones has been developed among which molecular procedures are the most prominent. Nucleic acid amplification has become common and to date syndrome-guided multiplex PCR testing is the Gold Standard. Methods are automated and “sample in – result out” assays exist. In addition, (next generation) nucleic acid sequencing has evolved at extreme speed and a combination of amplification- and sequencing-based diagnosis is becoming more common. This includes the sequencing of complete bacterial genomes facilitating tests in which species identification, epidemiological spread of the organism, (genomic) AST and the detection of essentially all of its virulence factors is possible.

The presentation will realistically define the pro’s and con’s of both the innovative “classical” and new tests and will sketch the lay out of the future clinical microbiology laboratory.
ELIMINATE VERTICAL TRANSMISSION: IS IT ACHIEVABLE IN ASIA?
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“A child has the right to be born free from HIV”. The UNAIDS have set a target of eliminating vertical HIV transmission by 2020. The global criteria for elimination are: at least 95% coverage of HIV testing among pregnant women, over 90% ART coverage in HIV-positive pregnant women, and an HIV transmission rate of under 2% in the non-breastfed population or under 5% for the breastfed population. The Asia Pacific has set a target of reducing the number of new HIV infections in children to under 1900 cases per annum by the year 2020. A report from the UNAIDS however, estimated that the number of newly infected children under 15 years of age in 2015 was still 19,000 – 10 times higher than our set target. New and improved strategies are therefore urgently needed to tackle this problem.

A current major problem is achieving HIV testing coverage in antenatal care settings. Only 40% of HIV-infected pregnant women in the Asia Pacific region are identified. Secondly, in order to prevent HIV vertical transmission, HIV-infected pregnant women should have undetectable plasma HIV RNA by the time of delivery. The transmission rate is quite high up to 7.4% among late presenters, i.e. those who present less than 4 weeks before delivery. Integrase inhibitors, which is a drug class which has the most rapid HIV viral load reduction, should be used as intensification to a standard 3-drug antiretroviral regimen in these high transmission risk pregnancies. Thirdly, increasing the involvement of male partner is important strategy that can be utilized to reduce overall transmission by reduce stigma on pregnant women and also detect HIV serodiscordant couples that female partners are at risk of acquire HIV infection from her husband during pregnancy and lactation. In this situation, HAART can be offered to the partner and time-limited preexposure prophylaxis (PrEP) to the woman.

The two important cascades that need to be implemented after delivery are early HIV infant diagnosis (EID) and retention of postpartum women in case. Currently, the uptake of EID for HIV-exposed infants in the Asia Pacific is less than 50%. It is extremely important for HIV-infected infants to be diagnosed and initiated on antiretroviral therapy early to reduce mortality rates. Retention of postpartum women in life-long ARV treatment and care requires cooperative integration to occur between antenatal and HIV care services. At the moment, over a third of HIV positive women are lost to follow-up at 1 year postpartum.

Thailand was the first country in the Asia Pacific to achieve HIV targets by the WHO in 2015. HIV transmission rates reduced from 4.6% in 2008 to 1.9% in 2015. During this session, I will discuss lessons learnt from Thailand. China is a good example of a country with a low HIV prevalence rate of < 0.1% that has a universal coverage program in parent to child HIV transmission prevention. This has been in place since 2015 in effort to achieve the <5% vertical transmission targets by 2020. With strong political leadership, integrated HIV services, and cooperation from the national and regional levels, it is my hope that the Asia Pacific Region will be able to achieve the HIV vertical transmission elimination goals set by the WHO by 2020.
The aim of this presentation is to provide an update on neonatal pharmacokinetics of antiretroviral agents for HIV prevention and recent advances in early antiretroviral therapy (ART) for newborns. Multiple clinical trials have demonstrated that administration of antiretrovirals to neonates born to women with HIV-infection is highly effective at preventing perinatal transmission of HIV, as well as preventing transmission through breastfeeding. Early antiretroviral treatment for infants with HIV-infection significantly reduces the risk of rapid disease progression and death. There is also increasing evidence that immediate antiretroviral therapy for babies identified as HIV-infected at birth may limit the accumulation of cellular reservoirs of HIV. Unfortunately, the number of approved antiretroviral drugs for neonates remains extremely limited due to the lack of appropriate formulations and pharmacokinetic data to inform dosing. Providing drugs to newborns poses unique pharmacokinetic challenges due to the rapid maturation of the metabolism/excretion pathways during the first weeks of life. Thus, dosing information cannot be easily extrapolated from older children and frequent dosing changes may also be necessary. The World Health Organization (WHO) recommends a weight-band dosing approach for infant prophylaxis and zidovudine and/or nevirapine are preferred. Currently, only zidovudine, lamivudine, nevirapine, lopinavir/ritonavir (≥ 14 days), and raltegravir have suitable formulation and adequate neonatal safety and pharmacokinetic data to allow use in neonates. Despite the approval of safer and more potent antiretrovirals drugs for adults over the last decade few have been approved for neonates. Continued efforts are needed to expedite the development and assessment of antiretroviral formulations for neonates.
TREATMENT OF HIV INFECTED CHILDREN: WHY IS IT SO DIFFERENCE FROM ADULTS?

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Over the past 20 years, we have seen in the Western world major developments in the HIV treatment armamentarium with more than 25 individual anti-HIV agents available for adults, as well as several fixed-dose combinations. International guidelines now recommend a standard 2 NRTI backbone of ABC/3TC, TDF/FTC or TAF/FTC to which a third agent is added which can be either dolutegravir, elvitegravir (boosted by cobicistat), raltegravir or darunavir (boosted by darunavir).

The same international guidelines for children do differ remarkably when compared to adults. Depending age of the child, agents such as zidovudine, nevirapine, lopinavir/r and atazanavir/r are among the recommended agents. Agents such as TAF and boosted-elvitegravir are only recommended at full-doses in adolescents.

One obvious explanation for these differences is the lack of clinical data in certain age populations and/or the absence of suitable pediatric formulations. Anno 2017, in the Western world it is still not possible to treat an HIV-infected child below the age of 12 years with a fixed-dose triple drug combination.

On a global scale, generic companies have been more pro-active in developing new formulations for children, for instance the LPV/r minitabs as an alternative to an oral solution. In 2018 a pediatric fixed-dose combination ABC/3TC/LPV/r is expected to become available. An important role plays the pediatric antiretroviral working group (PAWG) of the WHO which recommended weight-band dosing for all ARVs but it must be mentioned that this is often based on simulations and that clinical validation is pending.
CHILDHOOD INFECTION: CHANCE OCCURRENCE OR IN OUR GENES?

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CHILDHOOD INFECTION: CHANCE OCCURRENCE OR IN OUR GENES?

One of the commonest questions asked by parents of critically ill children, is "Why my child?" For most childhood infections, the pathogenic bacteria, viruses or parasites cause either mild disease or asymptomatic colonisation in the majority of the population. Devastating and life threatening infection like meningococcal sepsis, pneumococcal meningitis, tuberculosis, or fulminant viral infection occur only in a tiny proportion of those exposed to these pathogens. This talk will address the question: what is the contribution of host genetics to the occurrence of childhood infection and to the severity and outcome of disease when it occurs?.

The genomic revolution, and development of methods to rapidly sequence the entire genome, as well as to undertake genome wide identification of common polymorphisms has resulted in an exponential increase in our understanding of the role of human genetic variation in determining susceptibility and outcome of childhood infection. The talk will discuss progress in identifying both Mendelian single gene defects that result in susceptibility to common infections, as well as the contribution of common polymorphisms. Using meningococcal disease and mycobacterial disease as the examples, and extending the findings to other common bacterial infections, methods for identifying the genetic contribution, and the extent to which they determine disease occurrence will be explored, providing new insights into the mechanisms underlying common infections.
Latin America is a very big continent with more than 700 million inhabitants. Brazil is the most populated country with more than 200 million in 2017 and Uruguay is the least populated with around 3.4 million in 2015.

With very good national programs of vaccination in all age groups, the Americas have eliminated five diseases positioning itself as a global leader in vaccination. In all four cases below, the region was the first in the world to achieve elimination. The America Region showed regional eradication of smallpox in 1971, was the first region to eliminate Polio in 1994 (24 years without Polio in 2017), was the first region to eliminate endemic transmission of Rubella and eliminate Congenital Rubella Syndrome in 2015, and was the first in the world to have eliminated endemic transmission of Measles in 2016.

Since April 2003 until 2017, the Latin America celebrate the Vaccination Week in the Americas (VWA). More than 640 million people were vaccinated under this umbrella. The regional slogan for VWA 2017 is “Get Vax to celebrate a healthy tomorrow!”

Efforts have been made to complete basic vaccination schedules. Countries and territories used different strategies to capture children and other population.

Latin America has demonstrated amazing results in control of infectious diseases preventable by vaccination. In general, in spite of the difficulties, the vaccination coverage is under control.

However, there are still a work to be done: 1.4 million children in the Region of the Americas have not completed their basic vaccination schedule, as reported by PAHO.

In addition, the Region of Americas face several challenges such as outbreaks in some countries, difficulties in implementation, technical challenges in vaccinology and hard to reach populations.
Understanding the etiology of pneumonia is critical for accelerating interventions to treat and prevent this leading cause of child mortality. The Pneumonia Etiology Research for Child Health (PERCH) study is a 7 country study in Africa and Asia designed to determine the etiology of pneumonia in this era of widespread conjugate Hib and pneumococcal vaccination. PERCH is a highly standardized case-control study of World Health Organization (WHO)-defined severe and very severe pneumonia among over 4000 hospitalized children 1 to 59 months of age and over 5000 age-matched controls. Cases and controls had multiple clinical specimens collected which were analysed by molecular and culture methods; cases had chest x-rays obtained and read using standardized WHO criteria. Important limitations of standard approaches to descriptive etiology analysis were addressed using a Bayesian, partial latent class analysis approach to combine the results from the pathogen testing and quantify the etiologic probability in individual cases and in the population. The WSPID 2017 PERCH Symposium will present a description of the cases and controls, the primary etiology results, and a clinical and etiologic description of mortality in PERCH. Further, the presentation will highlight the value of post-mortem minimal invasive tissue sampling to better characterise the complexity in attributing pathogen specific causes of death in children dying from pneumonia.
Humans, as other animals, coevolved microbes that colonize epithelia, and an immune system that protects “forbidden territories” from microbes. The immune system in humans is experiencing an increasing incidence of disorders such as asthma, T1D, allergies and obesity. C-section birth has been associated with the increase of the same modern diseases, also associated with early antibiotics, suggesting that early impact in the microbiome is involved in the etiology of these diseases. C-section significantly alters the microbiota composition during infant development. The C-section microbiota can be restored by exposure to the vaginal microbes of their mother, at birth. However, whether this restoration protects against increased risks associated with C-section is not known. We have shown in mice that C-section causes overweight and loss of diversity, similar to the phenomenon observed in urban human societies. We need to find ways to restore the altered natural microbial exposures during childhood to arrest and prevent the current disease trend.
All animals possess their own species-specific microbiome. There is increasing evidence that humans have an inherited and conserved early life microbiome that performs many important developmental functions. However, in its early days, as the microbiome is being established, the eco-system resilience may be low, in that transient perturbations could have long-term effects. Antibiotic use in young children is intense in most parts of the world, often with multiple courses in the first few years of life. We established mouse models to advance our understanding of the interaction of early life antibiotic exposures on the development of both the adult microbiome and the host. Our studies show that antibiotic exposures early in life perturb the microbiota and have disproportional effects on host metabolic and immunological development. Antibiotic exposures in a prior generation also may be significant. These studies provide evidence that early life antibiotic exposures may be contributing to the worldwide epidemics of obesity, asthma, and other allergic and inflammatory diseases.

Identification and continued monitoring of pneumococcal serotypes is essential to assess vaccine impact. Development of sensitive and rapid identification and typing method is of importance as presently used methods are error prone and time-consuming with limited serotype coverage. This study was designed to develop and evaluate a high-throughput molecular assay to address the problems.

In the first step, qmPCR was carried out using ply, lytA and psaA primers. Subsequently qmPCR positive samples were tested with a multiplex PCR with 39 fluorescent labeled primers (www.cdc.gov) using Qiagen Multiplex PCR Plus kit. cpsA gene was used as internal control. Sizing of PCR products was performed on ABI PRISM 3130xl Genetic Analyzer to determine the serotype.

The assay was compared with culture and Quellung reaction for its specificity and sensitivity. 70 pneumococcal reference strains and 325 nasopharyngeal samples were analyzed.
**Results**

Out of 325 NP swabs, 22 were positive for culture and 82 by qmPCR. mPCR-FAF could identify serotypes in all the 82 qmPCR positive samples. Multiple serotype carriage was observed in 10 nasopharyngeal samples (2 types in 9, 3 types in 1) which included 2 culture positive and 8 culture negative. The results showed 100% correlation with quellung test for reference strains and clinical isolates.

**Conclusions**

The study reveals the usefulness of mPCR-FAF typing for direct detection and typing of multiple serotypes of *S.pneumoniae* from culture positive and negative samples. The use of this simple and high throughput method in pneumococcal NP surveillance studies will improve the accuracy of detection and coverage of strains.
THE ANALYSIS OF NASOPHARYNGEAL PNEUMOCOCCAL CAPSULAR SEROTYPE DISTRIBUTION AND RELATIONSHIPS WITH DIFFERENT CLINICAL FEATURES DURING CHILDHOOD PNEUMONIA

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Background and aims

We attempted to explore the characteristics and associations between carried pneumococcal serotypes and patients’ clinical features.

Methods

Retrospective analysis clinical data of 5960 cases with pneumonia in respiratory ward of Chongqing Medical University Affiliated Children's Hospital between June 2009 and December 2016,Nasopharyngeal aspiration were collected when admitted to hospital in 24 hours and executed common viral diagnostic tests and bacterial culture .Multiplex PCR and sequencing method were used to confirm pneumococcal capsular serotypes;

Results

1. There were 712 positive pneumococcal cases in all 5960 pneumonia children (11.9%). The longer hospital stay and higher blood leukocyte courts were detected in positive pneumococcal culture group than in negative group (p value were 0.003 and 0.037) ; 2. There were 15 kinds of different serotypes were detected. The most common serotypes were 19F (34.8%)、6A/B (27.4%)、19A (9.7%)、15B/C (9.2%)、23F (8.1%); There were 192 cases of straight-chain pneumococcal capsular serotype and 67 cases of branched-chain serotype; 3. Compared clinical data among different serotype groups: the hospital stays of 15B/C serotype group were longest than other serotype groups. Blood leukocyte courts of 6AB serotype group were the lowest, The difference were significantly respectively with 6A/B serotype group and 19F serotype group （p value were0.044 and 0.007） 4. There were much more persistent pneumonia cases in branched-chain serotype group than in straight-chain serotype group （p=0.046）

Conclusions

There were association between different nasopharyngeal pneumococcal capsular serotype and the state or course of pneumococcal pneumonia. Therefore pneumococcal capsular serotype detection was effect to evaluate the condition of pneumococcal pneumonia,
ALTERNATIVE SCHEDULES OF PNEUMOCOCCAL CONJUGATE VACCINE ADMINISTRATION IN VIETNAM

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Background and aims

There is currently controversy about whether pneumococcal conjugate vaccines should be given as a 3-dose primary series, as originally recommended by WHO, or as a 2-dose primary series with a later dose at 9-12 months, the so-called 2+1 schedule. We have undertaken a detailed study of four different schedules of PCV10 (Synflorix®, GlaxoSmithKline), and compared the 2+1 schedule with a 2+1 schedule of PCV13 (Prevnar-13O, Pfizer) in 1200 Vietnamese infants in Ho Chi Minh City.

Methods

The study was conducted as an open randomized trial. Infants received PCV10 at 2,3,4,9 months, 2,3,4 months, 2,4,9 months and 2,6 months. One group received PCV13 at 2,4,9 months and an unvaccinated control group was recruited for evaluation of carriage. Immunology was evaluated by ELISA antibodies, opsonophagocytic antibodies and B-cell assays. Impact on nasopharyngeal carriage was evaluated by routine microbiology and microarray.

Results

After the primary series, 2+1 and 3+0 showed good responses to all serotypes with higher antibody levels in the 3+0 group for all except 19F. At 9 months these differences were still evident. Responses to booster doses were comparable in the 2+1 and 3+1 groups with superior antibody levels extending to 18 months. After a single dose PCV10 showed better antibody responses than PCV13, but after the primary series PCV13 responses were better. By 9 months PCV10 responses were better for 6B, 19F and 23F. A similar pattern was seen after the booster dose.

Conclusions

This study supports the use of simplified schedules of PCV. More detailed immunological results will be presented.
INVASIVE PNEUMOCOCCAL DISEASE IN CHILDREN WITH UNDERLYING COMORBIDITIES
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Background and aims

_Streptococcus pneumoniae_ is a major cause of severe and life-threatening diseases in children and particularly among those with high-risk illnesses. As there is limited clinical data on IPD in high-risk patients in the post-PCV10 era in developing countries, we’ve assessed the IPD epidemiology children with and without selected underlying diseases before and after PCV10 introduction in Brazil.

Methods

We’ve performed a prospective hospital-based surveillance study of patients with IPD from January 2000 to April 2017, including all cases of IPD among patients under 17 years. The identified serotypes were grouped according to the available pneumococcal vaccines and further analyzed into pre- (2000-2009) and post-vaccination periods (2010-2017). Ethical approvals were obtained.

Results

284 episodes were identified, of which 51.7% had comorbidities. Among healthy individuals and those with underlying comorbidities, annual cases decreased from 5.7 to 1.7 (69.2%) and 11.2 to 4.3 cases/year (61.6%), respectively, before and after PCV10 introduction; 30-day mortality in pre-vaccine period was 3.5% and 9.9% and in post-PCV10 period 0% and 12.2%, for healthy and comorbidity groups, respectively. IPD significantly decreased among healthy and comorbidity children <5y, without evidence of serotype replacement; however, steady episodes of bacteremia were seen and increasing trends in serotype replacement after PCV10 in age group “5-17 yo” with comorbidities. The most prevalent clinical diagnosis was pneumonia in “under 2 y” and “2-4 yo” groups and bacteremia in “5-17 yo”.

Conclusions

High rates of IPD have persisted in older patients and in the population with established risk factors for pneumococcal disease despite mass children vaccination with PCV10.
The Portuguese Study Group on IPD conducted a national study on IPD in children, in Portugal. The seven-valent pneumococcal conjugate vaccine (PCV7V) was licensed in 2001. PCV10V was introduced in 2009 and PCV13V in 2010 and is included in national immunization program in 2015. The estimated coverage rate is 79% in 2007 and is 85% actually. To analyse the incidence, clinical data, morbidity and mortality of IPD in children in the last eight years.

National, multicenter study in 57 hospitals, between May 2008 and May 2016, in children <18 years old, with positive culture or PCR for *Streptococcus pneumoniae* in sterile body fluids.

A total of 801 cases were identified with an incidence rate of 35.5:100,000 children <1 years. Diagnosis were meningitis (15.9%), sepsis (7.2%), pneumonia (51.5%), occult bacteraemia (16.7%) and other bacteraemia (7.5%). Complications occurred in 35.9% of the children and mortality rate was 1.4%. Serotype 3 and 1 was more frequent (22.5%). Emergence of non vaccine types was detected (34%) in the last years but also an increase in the proportion (20.2%) of PVC7 types (6B, 14, 19F, 23F) probably related to the decrease in vaccination rates (79% versus 58%) due to economic problems in the country, before the introduction of the vaccine in the national immunization program.

It is extremely important to enforce the ongoing clinical, epidemiological and microbiological national surveillance of IPD to allow for precise and updated recommendations on vaccination.
Background and aims

To estimate the likelihood of bacterial infections and the severity of disease, use of blood biomarkers reflects the host response to infection. The specificity of molecular detection of S. pneumoniae from blood could be improved by combining it with biomarkers. This study was designed to evaluate the efficacy of biomarkers in relation to culture and PCR for the diagnosis of infection.

Methods

Fifteen hundred and four children between 28 days to 60 months of age with clinically suspected IPD or Pneumonia were included in the study. The enrolled cases were subjected to TLC and PCT tests for septicaemia evaluation. Blood culture and corresponding serum qmPCR were performed on all samples.

Results

Blood culture and qmPCR identified invasive pneumococcal infection in 7.2% (n=108) and 30.3% (n=456) of cases, respectively. PCT was positive in 100% of cases. The results were analyzed by categorizing 1504 cases into 3 groups- I) Culture negative and qmPCR negative (n=1048), II) Culture negative and qmPCR positive (n=348) III) Culture positive and qmPCR positive (n=108).

The mean TLC and PCT values observed for group-I was 14.9 x 10^3/µl and 14.78 ng/ml. In group-II, the mean TLC and PCT values were 15.2 x 10^3/µl and 17.68 ng/ml. Whereas, in group-III, the mean TLC and PCT values were 15.6 x 10^3/µl and 22.62 ng/ml.

Conclusions

Elevated TLC and PCT values correlated with the presence of pneumococcal infection confirmed by culture and qmPCR. Higher. These biomarkers can serve as useful markers when used in conjunction with culture and PCR for the diagnosis of IPD.
PREVALENCE OF PANTON-VALENTINE LEUKOCIDIN (PVL) IN COMMUNITY-ACQUIRED STAPHYLOCOCCUS AUREUS ISOLATES IN THE GAMBIA: A 10 YEAR PERIOD RETROSPECTIVE PILOT STUDY

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Background and aims

Staphylococcus aureus causes infections ranging from mild skin and soft-tissue infections to life-threatening sepsis. Methicillin-resistant S. aureus infections were previously associated with hospital acquisition but emergence of community-acquired (CA-MRSA), however, is on the increase. Panton-Valentine leukocidin (PVL) is a two component toxin associated with S. aureus virulence and PVL-positive methicillin susceptible S. aureus is considered an important reservoir for CA-MRSA. This study aims to determine the PVL prevalence and its association with antibiotic resistance of S. aureus in The Gambia.

Methods

All invasive S. aureus strains from patients investigated for invasive infections, stored in >-70°C from 2005 to 2015 were retrieved. For each invasive strain, three cutaneous isolates recovered from a patient of similar age distribution and within two weeks were included. Susceptibility was done according to CLSI guide and genomic DNA was extracted using QIAGEN mini kit (Qiagen, Netherlands). A conventional gel base PCR was done to confirm presence of the lukF and lukS PVL genes.

Results

Overall prevalence of PVL was high in both soft tissue (134/228; 58.8%) and invasive isolates (56/78; 71.8) but evidence of a higher prevalence was in invasive samples p value 0.041. Overall antimicrobial resistance was chloramphenicol (4.9%), cefoxitin (2.6%), ciprofloxacin (3.6%), erythromycin (8.9%), gentamicin (5.2%) penicillin (92.5%), tetracycline (40.8%) and sulfamethoxazole-trimethoprim (23.5%). There was no PVL association with antimicrobial resistance.

Conclusions

PVL expression is high in Gambian MSSA and this warrants monitoring as this could lead to spread of virulent PVL-positive MRSA strains especially when S. aureus has emerged as the prevalent pathogen causing bacteraemia.
ORAL PRESENTATIONS 2

CLINICAL VALUE ASSESSMENT OF FLUORESCENCE QUANTITATIVE PCR IN DIAGNOSIS OF MYCOPLASMA PNEUMONIAE INFECTION
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Beijing Key Laboratory for Research on Prevention and Treatment of Tropical Diseases, Beijing, China
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³Beijing Children’s Hospital- Capital Medical University, Pediatrics, Beijing, China

Background and aims

This research is intended to compare and assess the clinical value of laboratory diagnosis of Mycoplasma pneumonia (MP).

Methods

Based on 73 swabs and acute-recovery paired serums from the children who were diagnosed with MP infection and 349 swabs of the healthy children, the clinical value was assessed with the standards which there is a 4-fold change for the paired serum antibody titers.

Results

1. The positive rate of the swabs from the healthy children, detected with the culture and the real-time PCR, were 18.9%, 0.6%. 2. The sensitivity of culture, molecular biological methods detecting MP-DNA and MP-RNA, ELISA and passive agglutination method detect the acute serum were 61.5%, 94.2%, 78.8%, 86.5%, 75%, the specificity were 100%, 57.1%, 81%, 66.7%, 100%. 3. When detected with a combination of the passive agglutination method, the sensitivity and specificity of MP-RNA were 94.2%, 81%.

Conclusions

1. There is certain degree of asymptomatic carriage of MP in healthy children. 2. Molecular biological method detecting the MP-RNA can reflect that the pathogeny were alive, has a higher specific than DNA, cannot distinguish between colonization and infection status too. Using them to the diagnosis of MP should be combined with clinical methods. Detecting acute serum can provide a reference for the diagnosis of MP, the cutoff of it need to be researched through collecting more clinical samples. 3. Detecting the RNA of MP combined with the single serum antibody titers by the passive agglutination method can improve the sensitive rate. While, there has no any influence for the specificity. It is suggested that MP infection should be detected by both methods clinically.
EPIDEMIOLOGICAL SURVEILLANCE OF SCARLET FEVER AND GROUP A STREPTOCOCCUS IN CHILDREN IN SHANGHAI DURING 2011-2015

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Background and aims

Annual outbreak of scarlet fever among children occurred in Shanghai since 2011. Investigation of epidemiology is helpful to enhance our understanding of the factors related to the outbreaks. This surveillance study aimed to understand the epidemiology of scarlet fever outbreak and the pathogenic factors associated with outbreak.

Methods

We performed an active surveillance of scarlet fever and GAS carriage among children in Shanghai and characterized the emm types, superantigen profiles and antimicrobial susceptibility of GAS isolates.

Results

The number of culture-proven scarlet fever cases ranged from 959 (2013) to 2508 (2015). Scarlet fever was prevalent throughout the year and peaked between April and June during late spring to mid-summer in Shanghai, and a smaller peak can also be observed between November and January in the winter season. Of 8362 children with culture-proven scarlet fever, boys outnumbered girls (62.8% versus 28.2%); children attending kindergarten and school accounted for 96.6%. All cases fully recovered. Nine emm types (emm1, 3, 4, 11, 12, 22, 75, 89, 170) were identified with 68.7% of emm12 and 39.4% of emm1. The prevalence of emm1 increased since 2013. No speA and speM were detected in 45 isolates. The frequencies of resistance to erythromycin, arithromycin and clindamycin among GAS isolates were 99%.

Conclusions

emm12 GAS isolate caused the 2011 large outbreak of scarlet fever in Shanghai. The benign outcome of outbreak could be associated with the prevalence of emm type and superantigen profiles. The antibiotic resistance to macrolides and clindamycin in GAS was serious in Shanghai.
Background and aims

Pathogenesis of NEC still remains unknown. It is widely accepted that the gut microbiota relate with NEC. This aim to clarify change of gut microbiota in NEC patients, explore possible way for how microbiota’s change to cause gut inflammation.

Methods

All infants both surgical or medical neonates were recruited as NEC group. Fecal samples 16s rDNA high-throughput sequencing was used to analysis the constitution of microbes. Functional predictions of microbiota were compared by PICRUSt. The metabolites of the infants were analyzed through LC-MS and GC-MS. Surgical patients removal tissues were collected to analysisized Treg/CD4+T cell ratio through flow cytometry.

Results

Increase of Proteobacteria and decrease of Firmicutes were identified. Functional prediction showed that the lipid metabolism and xenobiotics biodegradation and metabolism were lower in NEC group. The LC-MS analysis showed the metabolites in NEC cases differed significantly from control cases, and the most was Butanoate. The GC-MS analysis showed butyrate and acetate from NEC infants were lower. Decrease of Treg/CD4+T cell ratio in NEC infants, the expression of IL-10 and TGF-β were lower (p<0.05). The butyrate treated mice exhibited higher weight, lower pathologic intestine injury and higher Treg/CD4+T cell ratio in both small intestine and colon in comparison with PBS treated mice after NEC modeling. In vitro: The butyrate showed the ability to increase the expression of IL-10 and TGF-β in both QPCR and ELISA analysis in RAW macrophages (p<0.05).

Conclusions

NEC may have lower SCFAs due to decrease of Firmicutes. The naive CD4+T cell are more likely to differentiate effector T cells rather than Treg cells depending on less IL-10 and TGF-β.
DECREASED SLC5A8 EXPRESSION ASSOCIATED WITH H PYLORI INFECTION IN YOUNG CHILDREN IS DUE IN PART TO HYPERMETHYLATION WITHIN THE PROMOTER
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Background and aims

Our previous studies in Chilean cohorts indicated that H. pylori infection is associated with decreased expression of SLC5A8 in infected compared to non-infected children. SLC5A8 has been reported to function as a tumor suppressor gene and is silenced in gastric and colon cancer by hypermethylation of CpG-rich-islands located in exon 1. The aim is to determine if decreased expression of SLC5A8 in infected children is due to hyper-methylation within the SLC5A8 promoter region.

Methods

We selected a subset of blood and gastric tissue samples from infected and non-infected children to determine gene expression and infection status as previously reported (WSPID-2015). DNA methylation assays were performed in 14 tissue samples using the EZ-DNA Methylation-Direct-kit®. The sequence data analysis was performed using the BISMA-platform.

Results

H. pylori decreased SLC5A8 expression in blood and tissue samples. The SLC5A8 expression level was independent of the extent of gastric damage in tissue samples of infected and non-infected children. However, methylated cytosine levels increased in infected (27%) vs non-infected (7%) children p=0.0028. Moreover, Spearman correlation analysis between SLC5A8 expression and the degree of methylation revealed an inverse correlation $r=-0.688$, p=0.0043.

Conclusions

Decreased expression of SLC5A8 in infected children with H. pylori is due in part to methylation of the CpG-region in exon 1 of the promoter gene. Further studies are required in a larger sample set.
employing additional techniques (methylation-array or pyrosequencing) to confirm this result. To our knowledge, this is the first study linking suppression of SLC5A8 by hypermethylation to *H. pylori* infection in young children.
THE EPIDEMIOLOGY OF NON-VIRAL GASTROENTERITIS IN NEW ZEALAND CHILDREN
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Background and aims

Acute gastroenteritis is an important cause of hospitalisation in children. *Shigella, Salmonella, Campylobacter, Yersinia, Escherichia coli, Giardia and Cryptosporidium* are non-viral gastrointestinal pathogens which are notifiable in New Zealand (NZ). To date, the impact of these infections in the paediatric population has not been analysed. The aim of this study was to describe the epidemiological trends in disease notifications and hospital admissions from non-viral gastroenteritis in NZ children.

Methods

Population-based descriptive study using data on disease notifications and hospitalisations from 1997 to 2015. Age-specific and age-standardised notification and admission rates in children <15 were calculated.

Results

From 1997-2015 there were 547,876 notifications (57.6% male) and 25,412 hospitalisations (56.4% male) due to non-viral gastroenteritis in NZ children. *Campylobacter* was the disease most frequently notified. Hospitalisation rates were typically lower than the corresponding notification rates for each disease. Overall notification and hospitalisation rates decreased over time, particularly since the mid-2000’s, although rates of *E coli* increased.
Notification rates were highest in children 1–4 years of age, with the exceptions of non-typhoidal Salmonella and Yersinia. Salmonella typhi notifications were infrequent but were most common in those aged 5-9 years of age. Hospitalisation rates for campylobacter, non-typhoidal Salmonella and Yersinia were highest in those aged <1 year, and for cryptosporidium, E coli and shigella those 1-4 years of age.

Conclusions

The prevalence of non-viral gastroenteritis in NZ children is lessening over time and burden of disease is highest in the community, with only a small percentage of cases necessitating hospital admission.
FACTORS ASSOCIATED WITH FATAL OUTCOME OF CHILDREN WITH ENTEROVIRUS A71 INFECTION - A CASE SERIES
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Background and aims
Enterovirus 71 (EV-A71) outbreaks have been raising considerable public health concerns since the late 1990s. EV-A71 may be fatal, but mechanisms, symptoms, and signs are poorly understood. Determining the fatal progression of EV-A71 infection could be useful to identify the patients who could benefit from treatments. Therefore, the aim of the present study was to examine the natural history of fatal EV-A71 infection and to identify the symptoms and signs for early warning of deterioration.

Methods
This was a 5-year multicenter clinical observational study of fatal cases of EV-A71 infection. Between January 1st, 2010 and December 31st, 2012, there were 5504 confirmed in patients with severe EV-A71 infection in the five hospitals. The exposure was death from EV-A71 infection. We recorded and analyzed 91 manifestations of EV-A71 infection in order to identify indicators for early assessment.

Results
Fifty-four fatal cases were included. Median age was 21.5 months (Q1-Q3: 12-36). The median duration from onset to death was 78.5 hours (range, 6 to 432). The multilayer perceptron analysis showed that ataxia respiratory, ultrahyperpyrexia, excessive tachycardia, refractory shock, pharyngeal reflex absent, irregular respiratory rhythm, hyperventilation, deep coma, pulmonary edema and/or hemorrhage, excessive hypertension, tachycardia, somnolence, CRT extension, fatigue or sleepiness, and age were associated with death. Autopsy findings showed neuronal necrosis, softening, perivascular cuffing, colloid, and neuronophagia phenomenon in the brainstem.

Conclusions
The fatal cases of enterovirus A71 had neurologic involvement, even at the early stage. Direct virus invasion through neural pathway and subsequent brainstem damage might explain the rapid progress to death.
DEATH DUE TO DIARRHEA AMONG UNDER FIVE CHILDREN: A CROSS-NATIONAL STUDY OF 174 COUNTRIES OF THE WORLD

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Background and aims

Diarrhea is leading causes of mortally among under five children. Death due to Diarrheal Disease disproportionately distributed across the world countries, low-middle-income countries accounts high number of death. This study aims to examine the distribution of Diarrheal Death among 174 countries. Further to examine the effect accessed improved water sources, sanitation facilities, immunization, education, health expenditure, PerCapita GDP on death due to Diarrhea.

Methods

Present analysis used WHO, UNFPA and World Bank data from 2000 to 2015 for all countries with a population at least one million in 2015.

The global diarrhea death inequalities (relative) at a point in time were quantified by using Dispersion Measure of Mortality and Gini Coefficient. The convergence process was examined by using methods ranging from simple graphical tools (catching-up plots) to standard parametric (absolute β and σ convergence) and. OLS regression used to examine effect of socioeconomic, environment and healthcare parameters on Diarrhea Death.

Results

Globally, under five Diarrhea Death rate is 4 per 1000. More than half million deaths account due to Diarrhea only. OLS model shows significant effect of accessed improved water and sanitation on Diarrhea death. High level of access improved water sources (β=-0.1821, p<0.000) and sanitation (β=-0.1195, p<0.000) facility is significantly contributing to diminish death due to Diarrhea across the countries.

Conclusions

Focusing on comprehensive Diarrheal disease control strategy through improved case management, addressing social determinants of health like environmental sanitation and clean drinking water, health promotion regarding preventive practices to reduce the burden of diarrhea death among children across the world countries.
Human enteroviruses can cause a broad spectrum of diseases in children. It is anticipated that enterovirus 71 (EV71) infection will be prevented by EV71 vaccine currently available. This study aimed to the prevalence of EV71 and other enterovirus serotypes in children with hand-foot-mouth disease (HFMD), herpangina and encephalitis/meningitis in Shanghai during 2014~2016.

We collected samples from pediatric patients with HFMD, herpangina and encephalitis/meningitis during 2014~2016. The nested RT-PCR and sequencing were performed to identify the enteroviruses serotypes.

During 2014~2016, 1141 stool specimens from patients with HFMD, 111 throat swab specimens from patients with herpangina, 56 cerebrospinal fluid specimens from patients with viral encephalitis/meningitis were taken, respectively. Among HFMD patients, 14 enterovirus serotypes were identified, including coxsachievirus A6 (CA6, 39.26%), EV71 (38.83%), CA16 (14.11%), CA10 (4.29%), CA4 (1.75%), CA2 (0.79%), CA9 (0.26%), E18 (0.26%), CA12 (0.08%), CA18 (0.08%), CA17 (0.08%), coxsachievirus B1 (CB1, 0.08%), echovirus 30 (E30, 0.08%), E3 (0.08%). Among 191 HFMD-associated encephalitis/meningitis cases, 7 enteroviruses serotypes were identified, including EV71 (79.69%), CA6 (10.94%), CA16 (5.73%). CA2 (1.56%), CA10 (1.04%), CA4 (0.05%), E30 (0.05%). Among herpangina patients, 8 serotypes were identified, including CA6 (28.83%), CA10 (22.52%), CA2 (21.62%), CA16 (10.81%), CA5 (8.11%), CA4 (6.31%), CA9 (0.90%) and CA12 (0.90%). Enterovirus was positive in 23 (41.07%) cerebrospinal fluid specimens from viral encephalitis/meningitis and 8 serotypes were identified, including E30 (34.78%), E9 (13.04%), CA6 (13.04%), CA2 (13.04%), CA9 (8.69%), E6 (8.69%), CA10 (4.35%), and CB3 (4.35%). All cases survived.

A great diversity of enterovirus serotypes circulated in Shanghainese. EV71 was associated with HFMD and severe HFMD, non-EV71 enteroviruses were responsible for herpangina and viral encephalitis/meningitis. Overall, CA6, CA10, CA2, CA16 were the common serotypes causing HFMD, herpangina and viral encephalitis/meningitis. E30 and E9 were frequent serotype responsible for encephalitis/meningitis.
CLINICAL AND EPIDEMIOLOGIC FEATURES OF VISCERAL LEISHMANIASIS IN CHILDREN IN SOUTHWESTERN CHINA: A RETROSPECTIVE ANALYSIS FROM 2001 TO 2015

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Background and aims

Visceral leishmaniasis (VL) is a life-threatening parasitic infection transmitted by phlebotomine sandflies. We undertook this study to analyze the clinical features of pediatric VL in a population of Chinese children.

Methods

A retrospective study was performed with pediatric patients (≤14 years) diagnosed with VL based on bone marrow biopsy, serology and diagnosis based on clinical manifestation and the improvement after the experimental drug when negative bone marrow and serology results were shown in West China Second Hospital, between January 2001 and December 2015.

Results

A total of 43 patients were determined as having a VL infection (ranging from 4 months to 12 years with a slight male preponderance). Sixty-seven percent were less than 5 years of age and 74% of patients resided in endemic regions. The average time to diagnosis from the onset of symptoms was 37.5 days (ranging from 5 days to 6 months). The main clinical manifestations were fever (98%), splenomegaly (98%), hepatomegaly (74%), pancytopenia (72%), pallor (33%), cough (33%) and lymphadenopathy (33%). Hepatic dysfunction was also found in 24 patients (68%). All patients were treated with meglumine antimonite; only 1 child was treated with liposomal amphotericin B after resistance to meglumine antimonite was discovered. Patients were clinically cured except for 1 patient, who died from hemorrhagic shock because of refusal of standard treatment.

Conclusions

Although there were no specific clinical manifestations of pediatric VL, a characterization of the overall symptoms may lead to an improved awareness of VL by clinicians and prompt early diagnosis and treatments. Presently, pentavalent antimony remains the first-line drug and there is low resistance in China.
Background and aims

Leishmaniasis affects about 350 million people in 88 countries around the world, 72 of which are developing countries. The aim is to determine the clinical and epidemiological characteristics of the cases of cutaneous Leishmaniasis, from the years 2012 to 2014, of the region Lambayeque in pediatric population (0 to 17 years).

Methods

A descriptive, retrospective study was conducted. all the pediatric population, represented by 579 cases were included. The source of data collection was through the clinical - epidemiological records of cutaneous leishmaniasis of the Lambayeque region. Statistical package STATA 11.0 was used for the data processing and Excel 2013 program, as a summary measure the percentage was used.

Results

The pediatric population represented 77.22% of the total of patients, the male sex with 56.43%. The incidence was 0.15 and 0.36 in the years 2013 and 2014 respectively, with Salas being the district with the highest cases. The most frequent anatomic site was upper limb with 36.79%, followed by face with 31.09% and lower limb with 24.18%. Local pruritus (47.15%) and pain (41.85%) were the main symptoms. The single lesion represented 60%, the ulcerative form being the most reported with 58.01%. The median time to evolution was 4 weeks and the median of the affected body surface was
Conclusions

Cutaneous leishmaniasis is reported mainly in boys, men, from Salas at 190 meters above sea level, with a single, ulcerated, pruritic and painful lesion predominating in the upper extremities, which is different from adults occurring in lower limbs.
EFFICACY OF FOUR SCORING SYSTEMS IN PREDICTING INTRAVENOUS IMMUNOGLOBULIN RESISTANCE IN CHILDREN WITH KAWASAKI DISEASE IN A CHILDREN'S HOSPITAL IN BEIJING, NORTH CHINA

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³Capital Institute of Pediatrics- Graduate School of Peking Union Medical College, Department of Cardiovascular Diseases, Beijing, China

Background and aims

To evaluate the predictive efficacies of 4 existing scoring systems for intravenous immunoglobulin (IVIG) resistance in Kawasaki disease (KD) in hospitalized children with KD in a children’s hospital affiliated with the Capital Institute of Pediatrics, Beijing, China.

Methods

We retrospectively analyzed 1569 children with KD treated at our children’s hospital between January 2010 and December 2015. Age, sex, clinical manifestations, and pretreatment hematologic indicators were recorded. Scores were assigned using 4 existing scoring systems: Egami, Kobayashi, San Diego, and Formosa. A 4-case table test was used to determine prediction efficacies.

Results

There were 63 IVIG-resistant cases (41 males, 22 females; average age, 2.5 years). Nine cases were classified as high risk for IVIG resistance by the Egami system, and this system had a sensitivity of 14% and a specificity of 86%. Ten cases had Kobayashi high-risk scores, and this system had a sensitivity of 16% and a specificity of 85%. The San Diego system assigned 60 cases as high-risk, and had a sensitivity of 95% and specificity of 3%. Finally, 27 cases had Formosa scores in the high-risk category, and this system had a sensitivity of 43% and a specificity of 47%.

Conclusions

None of the evaluated systems for assessing the risk for IVIG resistance displayed the combination of sensitivity and specificity necessary for screening. Our analyses show that the 4 scoring systems have limited utility in predicting IVIG resistance among patients with KD in our population.
Takeda’s live attenuated tetravalent dengue vaccine candidate (TDV) contains a molecularly characterized dengue serotype 2 virus (TDV-2) and three recombinant viruses expressing the pre-membrane (prM) and envelope (E) structural genes for serotypes 1, 3, and 4 in the attenuated TDV-2 backbone. Recruitment of 20,100 children and adolescents 4-16 years of age in 8 endemic countries in Asia and Latin America for a pivotal phase 3 efficacy trial (NCT02747927) was completed in 7 months, in March 2017.

Methods

Takeda’s dengue vaccine candidate has undergone extensive pre-clinical and clinical characterization and phase 1 and phase 2 clinical trials in more than 3,500 participants. Contemporarily, the breadth and quality of the immune response in animals and humans is being investigated.

Results

Pre-clinical studies were encouraging and supported progression into phase 1 clinical studies. In phase 1 and phase 2 clinical trials TDV was generally safe with acceptable reactogenicity in children, adolescents and adults, and no vaccine-related Serious Adverse Events occurred. In these clinical trials, TDV induced neutralizing antibodies against all four dengue serotypes, in participants irrespective of initial serostatus. Humoral and cell-mediated immune responses are directed at antigenic structural and non-structural dengue virus proteins.

Conclusions

The dengue virus backbone contributes to both humoral and cell-mediated responses that may be important for protection. Takeda’s dengue vaccine candidate has progressed to phase 3 clinical trials with a schedule of 2 doses administered 3 months apart. Takeda expects initial analysis of the phase 3 trial to be available in 2018.
IDENTIFICATION OF SUSCEPTIBILITY GENES ASSOCIATED WITH KAWASAKI DISEASE BY TARGETED ENRICHMENT OF GENOMIC REGION SEQUENCING TECHNIQUE

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Background and aims

To discover susceptibility genes associated with Kawasaki disease (KD) and coronary artery lesion (CAL) through targeted enrichment of genomic region sequencing technique.

Methods

114 KD patients and 45 outpatients for health examination were recruited from Shanghai children’s hospital between November 2015 and November 2016. Patients were divided into two groups on the basis of echocardiography, one is KD with CAL and another is KD without CAL. 472 single nucleotide polymorphisms associated with KD susceptibility genes and 512 genes in T cell receptor signaling pathway, toll-like receptor signaling pathway, Cytokine receptor interaction, TGF-beta signaling pathway were selected as targeted genes, and target exome capture sequencing chip were customized. Then use Illumina HiSeq X10 for high-throughput sequencing. The sequencing data were used to find out susceptibility genes associated with KD and CAL.

Results

There are 26 susceptibility genes associated with KD and 21 with CAL. The susceptibility genes associated with KD and CAL formation were mainly gathered in the cytokine-cytokine receptor interaction pathway through KEGG analysis. RPS6KB1, VAV1, ACVR2B and CXCL14 are significantly associated with KD. CCL4, TNFRSF12A, IFIH1 and IL26 are significantly genes of CAL formation. CXCL14 (rs1046092) T allele (OR=11.455, 95%CI=1.531-85.736), CXCL14 (rs2547) G allele (OR=11.070, 95%CI=1.477-82.972), CCL4 (rs1719152) T allele (OR=3.756, 95%CI=1.495-9.437) increased the risk of CAL (P<0.05).

Conclusions

Cytokine-cytokine receptors interaction pathway plays an important role in the occurrence of KD and CAL. RPS6KB1, CXCL14, VAV1 and ACVR2B are significant susceptibility genes of KD. CCL4, TNFRSF12A, IFIH1 and IL26 are related to the formation of CAL in KD patients.
This study was to analyze the relevance of genotyping with clinical features in GBS invasive infections of neonatal.

Summary

To determine the serotypes and genotypes of group B Streptococcus (GBS) isolated from neonates and understand the association between serotypes and genotypes and antibiotic resistance of GBS strains. A total of 26 group B Streptococcus (GBS) strains were isolated from neonates in our hospital between January, 2008 and August, 2014. Serotype III and sequence type ST17 were the major serotype and genotype of GBS strains causing invasive infections in neonates, respectively. GBS strains causing invasive infections in neonates exhibited a high rate of resistance to tetracycline, erythromycin, and clindamycin, therefore, penicillin is still the first-line antibiotic for the treatment of GBS infection. In addition, we identified an association between serotype III and genotype ST17 with septicaemia, purulent meningitis and pneumonia in GBS infections in neonates.

Table 1. Primers used for amplification of seven housekeeping genes.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Primer</th>
<th>Primer sequence (5’-3’)</th>
<th>Amplicon size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>adhP</td>
<td>Forward</td>
<td>GTTGGTACATGTAAGCTAAGC</td>
<td>704</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>ACTGTACCTCCAGCACCACCA</td>
<td></td>
</tr>
<tr>
<td>pheS</td>
<td>Forward</td>
<td>GATCTAGATGAAGCTAAT</td>
<td>762</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>TTGAGATCGGCCCATGAA</td>
<td></td>
</tr>
<tr>
<td>atr</td>
<td>Forward</td>
<td>CATTCTCTCTAGCTTTTGTTA</td>
<td>778</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>AGAAATCTCTTGTGCGGAT</td>
<td></td>
</tr>
<tr>
<td>glnA</td>
<td>Forward</td>
<td>CCGGCTACAGATGAAACATT</td>
<td>709</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>CTGATAATTGCATTCCACGC</td>
<td></td>
</tr>
<tr>
<td>sdhA</td>
<td>Forward</td>
<td>AGAGCAAGCTAATAGCCAAC</td>
<td>684</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>ATATCAGGCAAAACGCTG</td>
<td></td>
</tr>
<tr>
<td>glcK</td>
<td>Forward</td>
<td>CTCGGGAGGAAGCGACCGCT</td>
<td>641</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>AATACAGATGCACCTTTT</td>
<td></td>
</tr>
<tr>
<td>tkt</td>
<td>Forward</td>
<td>CCGGGGCTGGTGGCTTGA</td>
<td>657</td>
</tr>
<tr>
<td></td>
<td>Reverse</td>
<td>AATAGGCTTTTGGGGTTAAA</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Antimicrobial susceptibility of the 26 GBS strains isolated from neonates in China

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Susceptible</th>
<th>Intermediate resistant</th>
<th>Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetracycline</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>15.40%</td>
<td>0%</td>
<td>84.60%</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>18.60%</td>
<td>0%</td>
<td>81.80%</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>84.60%</td>
<td>0%</td>
<td>15.40%</td>
</tr>
<tr>
<td>Minocycline</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Penicillin</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Cefepime</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Meropenem</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 3. The minimum inhibitory concentration (MIC) of 6 commonly used antibiotics for 26 GBS isolates

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>MIC50 (mg/L)</th>
<th>MIC90 (mg/L)</th>
<th>MIC range (mg/L)</th>
<th>Susceptibility</th>
<th>Intermediate resistant</th>
<th>Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythromycin</td>
<td>&gt;256</td>
<td>&gt;256</td>
<td>0.25-&gt;256</td>
<td>15.40%</td>
<td>0</td>
<td>84.60%</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>32</td>
<td>&gt;256</td>
<td>0.094-&gt;256</td>
<td>18.20%</td>
<td>0</td>
<td>81.80%</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>24</td>
<td>48</td>
<td>12-&gt;256</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>0.75</td>
<td>&gt;32</td>
<td>0.5-&gt;32</td>
<td>84.60%</td>
<td>0</td>
<td>15.40%</td>
</tr>
<tr>
<td>Penicillin</td>
<td>0.064</td>
<td>0.064</td>
<td>0.032-0.064</td>
<td>100%</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Minocycline</td>
<td>4</td>
<td>8</td>
<td>0.8-8</td>
<td>100%</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Note: Evaluation of antibiotic susceptibility of GBS strains was conducted on the basis of the 2011 CLSI criteria. Erythromycin susceptibility: <0.25mg/L; Erythromycin intermediate: 0.5mg/L; Erythromycin resistance: >1mg/L. Clindamycin susceptibility: ≤0.25mg/L; Clindamycin intermediate: 0.5mg/L; Clindamycin resistance: ≥1mg/L. Tetracycline susceptibility: <2mg/L; Tetracycline intermediate: 4mg/L; Tetracycline resistance: ≥8mg/L. Levofloxacin susceptibility: ≤2mg/L; Levofloxacin intermediate: 4mg/L; Levofloxacin resistance: >8mg/L. Penicillin susceptibility: ≤0.12mg/L.

Table 4. Sequence types of the 26 GBS strains based on MLST
Allelic profile:

Table 5. The association between serotypes, genotypes, and clinical manifestations of GBS strains

<table>
<thead>
<tr>
<th>Clinical manifestation</th>
<th>Sampling site</th>
<th>Number of isolate</th>
<th>Serotype</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omphalitis</td>
<td>Umbilical secretions</td>
<td>2</td>
<td>Ib (1), V (1)</td>
<td>ST12 (1), ST456 (1)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Blood, throat swab, sputum</td>
<td>6</td>
<td>Ia (1), Ib (1), III (2), NT (2),</td>
<td>ST12 (1), ST19 (1), NT (1), ST17 (2), ST485 (1)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Blood</td>
<td>1</td>
<td>III (1)</td>
<td>ST17 (1)</td>
</tr>
<tr>
<td>Sepsis with pneumonia</td>
<td>Blood</td>
<td>8</td>
<td>III (8)</td>
<td>ST17 (6), ST171 (1), ST19 (1)</td>
</tr>
<tr>
<td>Sepsis with purulent meningitis</td>
<td>Blood</td>
<td>3</td>
<td>Ia (1), III (2)</td>
<td>ST17 (2), ST23 (1)</td>
</tr>
<tr>
<td>Sepsis with pneumonia and purulent meningitis</td>
<td>Blood</td>
<td>6</td>
<td>Ia (1), Ib (1), III (4)</td>
<td>ST17 (2), ST19 (2), ST12 (2)</td>
</tr>
</tbody>
</table>
ORAL PRESENTATIONS
ORAL PRESENTATIONS 5

A NOVEL PROTEIN VACCINE AGAINST GROUP B STREPTOCOCCAL DISEASE IS WELL TOLERATED AND HIGHLY IMMUNOGENIC IN A PHASE 1 TRIAL

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²Lund University, Adaptive Immunity, Lund, Sweden
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Group B streptococcus (GBS) infection is a leading cause of neonatal sepsis and meningitis. A fusion protein consisting of the N-terminal domains of the two related GBS surface proteins Rib and AlphaC (GBS-NN) represents a novel maternal vaccine candidate for prevention of GBS related neonatal disease. A two-part, randomized, double-blind, placebo-controlled, parallel group study conducted in a total of 240 healthy adult women has recently been completed and demonstrates that GBS-NN adsorbed to Alhydrogel® is well tolerated, highly immunogenic and gives rise to a long-lived immune response. This includes development of memory CD4+ T and B cells specific for both subdomains. The vaccine-induced antibodies bind to both AlphaC and Rib vaccine antigens and cross-reactive Alpha1 and Alpha2/3 antigens, as well as GBS isolates expressing these. Antibodies also demonstrated opsonic phagocytic activity (OPA) leading to killing of strains expressing each of these alleles, including clinical isolates of GBS that were obtained directly from cases of neonatal disease. In addition, the antibodies completely prevent GBS invasion of the cervical epithelial cell line ME180 at low ng/ml concentrations, demonstrating that the vaccine may also confer protection by targeting an important GBS virulence factor. Similar to naturally acquired antibodies against the N-domains of Rib and AlphaC, antibodies induced by vaccination with GBS-NN are almost exclusively of the IgG1 subclass and consistent with the active placental transfer of IgG1, we demonstrated a 123% placental transfer efficiency of the naturally occurring IgG against the vaccine antigens. Altogether, our results show that GBS-NN represents a highly immunogenic protein vaccine candidate that gives rise to antibodies that are efficiently transferred to the foetus, exhibit functional activity in multiple assays and have the potential to confer protection against neonatal disease caused by GBS of all serotypes.

A two-part, randomized, double-blind, placebo-controlled, parallel group study conducted in a total of 240 healthy adult women was conducted.

The Phase I trial demonstrated that GBS-NN adsorbed to Alhydrogel® is well tolerated, highly immunogenic and gives rise to a long-lived immune response. Vaccine-induced antibodies bind to both AlphaC and Rib vaccine antigens and cross-reactive Alpha1 and Alpha2/3 antigens, as well as GBS isolates expressing these. Antibodies also demonstrated opsonic phagocytic activity (OPA) leading to killing of strains expressing each of these alleles. The antibodies completely prevent GBS invasion of the cervical epithelial cells at low ng/ml concentrations, demonstrating that the vaccine may also confer protection by targeting an important GBS virulence factor. Similar to naturally acquired antibodies against the N-domains of Rib and AlphaC, vaccine-induced antibodies are almost exclusively of the IgG1 subclass and consistent with the active placental transfer of IgG1, we demonstrated a 123% placental transfer efficiency of the naturally occurring IgG against the vaccine antigens.
Our results show that GBS-NN represents a highly immunogenic protein vaccine candidate that gives rise to antibodies that are efficiently transferred to the foetus, exhibit functional activity in multiple assays and have the potential to confer protection against neonatal disease caused by GBS of all serotypes.
EFFECT OF EMOLLIENT THERAPY ON CLINICAL OUTCOMES IN PRETERM NEONATES IN PAKISTAN: A RANDOMISED, CONTROLLED TRIAL

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²Stanford University, Pediatrics, Palo Alto, USA

Newborn oil massage, a traditional community practice, could potentially benefit thermoregulation, skin barrier function, serious infections, morbidity and mortality in high-risk preterm infants, however it has only been evaluated in limited studies in low income settings.

A prospective, individually randomised, controlled, clinical trial was conducted to assess the efficacy of twice daily topical coconut oil application among a cohort of hospital-born preterm infant at Aga Khan University, Pakistan from birth till 28 day of life.

23% of the enrolled neonates developed clinically suspected sepsis while 14% developed bloodstream culture proven infection. After adjusting for gestational age, birth weight, duration of intubation and duration of hospitalisation for possible confounding, the hazard for hospital-acquired infection in the control group was 6.0 (95% CI 2.3-16) compared to the intervention group. The rate of hospital acquired infections in the control and intervention groups were 219.1 and 39.5 per 1000 patient days respectively. Mean weight gain was 11.3 g/day higher (95% CI 8.1-14.6, p<0.0001) and average skin condition was significantly better in the intervention group when compared to controls. There was no significant impact on duration of hospitalisation or neonatal mortality. No adverse effects such as local irritation or local infection were observed amongst newborns receiving coconut oil applications.

Topical emollient therapy was effective in maintaining skin integrity and reducing the risk of bloodstream infection in preterm infants in a tertiary hospital setting in Pakistan. The effectiveness of this approach in primary care settings needs to be further explored.
Background and aims

Preterm birth complications are the leading cause of deaths among children under five years. Studies have suggested Group B Streptococcus (GBS) maternal recto-vaginal colonization during pregnancy may be a risk factor for preterm delivery. We aimed to assess the association between GBS maternal colonization and preterm birth.

Methods

We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data on the association of preterm birth (<37 weeks’ gestation) and maternal GBS colonization (GBS isolation from vaginal, cervical and/or rectal swabs; with separate sub-analysis on GBS bacteriuria). We did meta-analyses to derive pooled estimates of the risk and odds ratios (according to study design), with sensitivity analyses to investigate potential biases.
Results

We identified 45 studies for inclusion. We estimated the risk ratio (RR) for preterm birth with maternal GBS colonization to be 1.21 (95% CI 0.99-1.48) (p-value=0.061) in cohort and cross-sectional studies, and the odds ratio to be 1.85 (95% CI 1.24-2.77) (p-value=0.003) in case-control studies. We found preterm birth association with GBS bacteriuria, in cohort studies RR=1.98 (95% CI 1.45-2.69) (p-value=<0.001).

Conclusions

From this review, there is evidence to suggest preterm birth is associated with maternal GBS colonization, especially where there is evidence of ascending infection or bacteriuria. Several biases reduce the chance of detecting an effect. Equally, however, results, including evidence for the association, may be due to confounding which is rarely addressed in studies. Assessment of any effect on preterm delivery should be included in future maternal GBS vaccine trials.
THE STUDY OF GROUP B STREPTOCOCCUS COLONIZATION AND INFECTION IN PRETERM LABOR WOMEN AND THEIR PRETERM INFANTS

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Background and aims

To study group B Streptococcus (GBS) colonization and infection status in preterm labor women and their preterm infants, analyze risk factors for GBS colonization and infection in preterm infants.

Methods

A total of 859 preterm labor women who delivered in Hospital from June 1, 2014 to May 31, 2015 were enrolled in this study. Secretions from the lower third of the vagina in preterm labor women were obtained to test GBS by standard bacterial culture, and 515 cases underwent GBS DNA test by real-time fluorescent quantitative-polymerase chain reaction (PCR) meanwhile. Sputum, gastric fluid or blood samples of preterm infants for GBS culture and pharyngeal swabs for GBS DNA were obtained. Colonization rates of the two methods were compared, and the status of GBS colonization and infection in preterm infants were analyzed, identify the perinatal risk factors of GBS colonization in preterm infants.

Results

The colonization rates of GBS culture and PCR assay were 14.78% and 15.14%, respectively. The colonization rate of preterm infants was 4.41%, 4 cases had early-onset GBS disease (GBS-EOD), of which 2 had pneumonia, 2 had sepsis, one case of sepsis complicated with meningitis, the infection rate was 4.09‰. Logistic regression analysis found that ruptured membranes≥18 hours was an independent risk factor for GBS colonization in preterm infants (P=0.001, OR=4.491).

Conclusions

Premature infants were sensitive to GBS infection, pay high attention to GBS screening and timely intrapartum antibiotic prophylaxis and administration for preterm labor women and their preterm infant, eventually to decrease the rate of GBS-EOD in preterm infants.
(-)-EPIGALLOCASETHIN-3-GALLATE ENHANCES POLY I:C-INDUCED INTERFERON-Λ1 PRODUCTION AND INHIBITS HCV REPLICATION IN HEPATOCYTES

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¹Children’s Hospital of Shanghai, Department of Gastroenterology- Hepatology- and Nutrition, Shanghai, China
²Temple University Lewis Katz School of Medicine, Department of Pathology and Laboratory Medicine, Philadelphia, USA

Background and aims

The interactions between HCV and the host immune system in the liver play a key role in the immunopathogenesis of HCV-induced diseases. The aim of this study was to investigate the effect of (-)-epigallocatechin-3-gallate (EGCG) on poly I:C-triggered intracellular innate immunity against HCV in hepatocytes.

Methods

HMW poly I:C and EGCG were used to stimulate the JFH-1-Huh7 cells. Real-time RT-PCR was used to detect the levels of intracellular mRNA and of intracellular and extracellular HCV RNA. ELISA was used to evaluate the interferon (IFN)-λ1 protein level in the cell culture supernatant. Immunostaining was used to examine HCV core protein expression in Huh7 cells.

Results

Our recent study showed that HCV replication could impair poly I:C-triggered intracellular innate immune responses in hepatocytes. In the current study, we showed that EGCG treatment could significantly increase the poly I:C-induced expression of toll-like receptor 3 (TLR3), retinoic acid-inducible gene I (RIG-I), and IFN-λ1 in JFH-1-Huh7 cells. In addition, supplementation with EGCG increased the poly I:C-mediated antiviral activity in JFH-1-Huh7 cells at the intracellular and extracellular HCV RNA and protein levels. Further investigation of the mechanisms showed that EGCG treatment could significantly enhance the poly I:C-induced expression of IFN-regulatory factor 9 (IRF-9) and several antiviral IFN-stimulated genes (ISGs), including ISG-15, ISG-56, myxovirus resistance A (MxA) and 2’-5’-oligoadenylate synthetase 1 (OAS-1), which are the key antiviral elements in the IFN signaling pathway.

Conclusions

Our observations provide experimental evidence that EGCG has the ability to enhance poly I:C-induced intracellular antiviral innate immunity against HCV replication in hepatocytes.
MEASLES OUTBREAK IN PEDIATRIC HEMATOLOGY AND ONCOLOGY PATIENTS IN SHANGHAI, 2015
Y. Ge¹, X. Wang¹, M. Zeng¹
¹Pediatric Hospital of Fudan University, Infectious Disease, Shanghai, China

Background and aims

Despite substantial progress towards measles control are making in China, measles outbreaks in immunocompromised population still pose a challenge to interrupt endemic transmission. The article aimed to investigate the features of measles in pediatric oncology patients and explore the reasons behind the outbreak.

Methods

We collected demographic, epidemiological, and clinical data of immunocompromised measles children. All suspected measles cases were laboratory-confirmed based on presence of measles IgM and/or identification of measles RNA. The clinical data were statistically analyzed by t-test for continuous variables and Fisher’s exact test for categorical variables.

Results

From March 9th to Jul 25th in 2015, 23 children with malignancies developed measles in Shanghai. Of these 23 patients with the median age of 5.5 years (range: 11months-14 years), 20 (87.0%) had received 1-3 doses of measles vaccine previously; all patients had fever with the median fever duration of 8.0 days; 21 (91.3%) had cough; 18 (78.3%) had rash; 13 (56.5%) had Koplik’s spot; 13 (56.5%) had complications including pneumonia and acute liver failure, and five (21.7%) vaccinated patients died from severe pneumonia or acute liver failure. Except the first patient, all patients had hospital visits within 7-21 days before measles onset and 20 patients were likely to be exposed to each other.

Conclusions

The outcome of measles outbreak in vaccinated oncology patients during chemotherapy and immunosuppressant medication was severe. Complete loss of protective immunity induced by measles vaccine during chemotherapy was the potential reason. Improved infection control practice was critical for prevention of measles in malignancy patients and transplant recipients.
Background and aims

Human parechovirus Type 3 (HPeV 3) is an emerging cause of disease in young infants however, long-term outcomes are poorly defined. We aimed to describe neurodevelopment at 12 months and 3 1/2 years post hospitalisation with early life HPeV infection in a cohort of infants hospitalised with the infection in Sydney.

Methods

Informed consent was obtained from parents/guardians of infants hospitalised with laboratory confirmed HPeV infection at Sydney Children’s Hospitals (Westmead or Randwick) during the 2013-2014 outbreak. Outcomes at 12 months were assessed by telephone interview using standardised questionnaires including: Ages and Stages questionnaire version 3 (ASQ3), Pediatric Quality of Life Inventory (PEDS-QoL), and Liverpool Outcomes Score (LOS); and at 3 ½ years by Bayley-III, and parent completed questionnaires (Child behaviour check list, PQoL ASQ-3, SF-12).

Results

79 children were hospitalised with HPeV3 infection during the outbreak. 46 of 79 were available for follow up at 12 months. Half (50%) had developmental concerns (ASQ3); 19% were rated as ‘Significant’, 31% rated as ‘Some’ concern; most deficits were in gross-motor and problem-solving domains. Infants with developmental concerns also had lower PEDS-QL and LOS scores. 50/79 Infants were available for follow up at 3 to 3/12 years of age by Bayleys III. Detailed analyses are underway, but preliminary analyses suggest most children scored in the normal range across all domains.

Conclusions

Neurodevelopmental concerns 12 months post infants HPeV3 were less apparent by 3 ½ years of age. Long follow-up is needed to better define the long term consequences of early life HPeV infection.
Background and aims

In this study, we hypothesized that the disease outcome would be influenced by the patient immunological status which reflects the combination of patient genotype and living environment/condition.

Methods

RNA sequencing (RNA-Seq) was used to analyze the whole transcriptome of peripheral blood mononuclear cells (PBMCs) isolated from patients with severe and mild disease, as well as healthy age-matched controls.

Results

The results showed that the genes involved in immune response-related pathways, especially in the innate immune pathways, were significantly up-regulated in mild cases but were down-regulated in severe cases, indicating that the innate immune response plays an important role in antiviral infection and in controlling progression of the disease. These results suggest a causal model in which an individual’s genotype influences their susceptibility to infection of human enteroviruses through changes in gene expression. Moreover, we analyzed the meta-transcriptome of HFMD patients and found that the differentially expressed genes in the gut were associated with the insufficient immune response in severe cases. Meta-transcript linkage analysis revealed that several gram-negative bacteria such as *Escherichia coli* and *Bacteroides* enriched in severe cases, and showed the enrichment of metabolic pathways in severe cases, implying that enrichment of certain bacteria may facilitate viral infectivity.

Conclusions

This integrative study combines genetic, transcriptional, and gut meta-transcriptome data to uncover the mechanisms affecting the severity of HFMD. Furthermore, we identified a series of biomarkers based on PBMC RNA-Seq, MHC polymorphism, and gut meta-transcriptome data, respectively, facilitating prediction of the severity of HFMD at the early stage of the disease.
ENTEROVIRUS 71 INHIBITS PYROPTOSIS THROUGH CLEAVAGE OF GASDERMIN D

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MOH Key Laboratory of Systems Biology of Pathogens- Institute of Pathogen Biology, Beijing, China

Background and aims

Enterovirus 71 (EV71) is a human pathogen that can cause hand-foot-and-mouth disease (HFMD) in young children. Severe infection with EV71 can lead to neurological complications and even death. However, the molecular basis of viral pathogenesis remains poorly understood. Recently, it has been reported that GSDMD mediates pyroptosis, the cleaved N-terminal fragment of GSDMD by caspase-1 or caspase-11 forms pores in the cytoplasmic membrane. It is believed that pyroptosis can inhibit and clear intracellular pathogens. However, whether viral replication or viral proteins inhibit pyroptosis is unclear.

Methods

We detected the degradation of GSDMD upon EV71 infection by Western blot assay. The cleavage site of 3C on GSDMD was identified by transfecting a series of mutants of GSDMD along with 3C, and then the cleaved band was detected by Western blot. The fragments of GSDMD-induced cell death were analyzed by using a cytoTox 96 nonradioactive cytotoxicity assay kit.

Results

We report that EV71 induces degradation of GSDMD. The viral protease 3C directly targets GSDMD and induces its cleavage at the Q193-G194 in the protease activity dependent manner. The cleavage produces a shorter N-terminal fragment spanning amino acids 1 to 193 (GSDMD1-193). Unlike the N-terminal fragment produced by caspase-1 cleavage, this fragment fails to trigger cell death or inhibit EV71 replication.

Conclusions

Our results indicated that EV71 may escape the antiviral response by cleavage of GSDMD.
Since 2001, the frequency with which the 2 B lineages have been found to cocirculate in a single season has been on the rise, a trend which has spurred the need for a quadrivalent influenza vaccine to protect against both B lineages. The WHO (World Health Organization) recommended that quadrivalent flu vaccines include both B lineages beginning in the 2013-2014 flu season. This study was conducted to evaluate the immunogenicity and safety of an egg cultivated quadrivalent, split influenza vaccine (GC3110A) in healthy Korean children and adolescents aged ≥ 6 months to < 19 years.

A total of 528 subjects were randomized to receive experiment or control group. The proportion of subjects in the GC3110A group who achieved seroconversion for each strain was confirmed to exceed 40% across all age groups. The proportion of subjects aged ≥ 6 months to < 3 years in the GC3110A group who achieved post-vaccination seroprotection was failing to meet the Ministry of Food and Drug Safety (MFDS) standard of 70%. Potential causes may include the small number of subjects, as well as the small dosage. However, results pertaining to the other age groups satisfied the MFDS standard. The safety profile was also comparable to that of the control vaccine.

Based on the above results, we expect that the new quadrivalent split influenza vaccine will offer broader protection to children and adolescents aged ≥ 3 years to < 19 years of age against both influenza B lineages than the existing trivalent influenza vaccines.
PROVIDING MISSING DOSES OF PENTAVALENT VACCINE TO MEASLES VACCINATED CHILDREN IS ASSOCIATED WITH INCREASED MORTALITY

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Between 2008 and 2015, the recommended vaccination schedule in Guinea-Bissau was BCG and Oral Polio Vaccine (OPV) at birth, Pentavalent vaccine (“Penta”, DTP-HepB-Hib)+OPV at 6, 10 and 14 weeks, and measles vaccine (MV)+yellow fever vaccine at 9 months. Studies indicate adverse consequences of providing DTP-containing vaccines after MV. Among measles-vaccinated children seen when aged 9-18 months we studied mortality according to receipt of the third dose of Penta (Penta3).

In 182 village clusters under demographic surveillance in Guinea-Bissau, we assessed children’s vaccination status the first home visit at 9-18 months of age. Missing vaccines were given to all children according to criteria defined by age and trials enrolling some children. Excluding children who took part in the trials, we compared mortality up to 5 years of age among measles-vaccinated children according to Penta3-status. We estimated Hazard Ratios (HR) in Cox-models controlling for age.

Among 7093 measles-vaccinated children, 635(12%) had not received Penta3 and 132(21%) of these children received a missing dose of Penta at the home visit. During follow-up, 204/6458(3%) children who were both measles and Penta3-vaccinated died. Mortality in measles-vaccinated, Penta3-unvaccinated children (17/503; 3%) was similar: HR=1.00 (0.62-1.63). However, mortality among children receiving Penta on the date of visit (10/132; 8%) was higher HR=2.13 (1.10-4.10). Adjusting for period, region, mid-upper-arm circumference or maternal education had little effect on the estimates.

Among measles-vaccinated children, missing Penta3 was not associated with higher mortality, but providing missing Penta was. All available data suggests that Penta3 should not be given after MV.
MEMORY-LIKE ANTIGEN-SPECIFIC HUMAN NK CELLS FROM TB PLEURAL FLUIDS PRODUCED IL-22 IN RESPONSE TO IL-15 OR MYCOBACTERIUM TUBERCULOSIS ANTIGENS

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Our previous result indicated that memory-like human natural killer (NK) cells from TB pleural fluid cells (PFCs) produced large amounts of IFN-γ in response to Bacille Calmette Guerin (BCG). Furthermore, recent studies have shown that human lymphoid tissues harbored a unique NK cell subset that specialized in production of interleukin (IL)-22. Yet little information was available with regard to the properties of IL-22 production by memory-like human NK cells. In this study, we aim to describe the characteristics of antigen-specific memory NK cells in the pleural fluid from TB patients.

Cell culture, cell sorting, FCM and ELISA

In the present study, we found that cytokines IL-15 induced and IL-12 enhanced the levels of IL-22 by NK cells from TB PFCs. In addition, IL-22 but not IL-17 was produced by NK cells from PFCs in response to BCG and M.tb-related Ags. The subset of specific IL-22-producing NK cells were distinct from IFN-γ-producing NK cells in PFCs. CD45RO⁺ or CD45RO⁻ NK cells were sorted, co-cultured with autologous monocytes and stimulated with BCG for the production of IL-22. The result demonstrated that CD45RO⁺ but not CD45RO⁻ NK cells produced significantly higher level of IL-22. Anti-IL-12Rβ1 mAbs (2B10) partially inhibit the expression of IL-22 by NK cells under the culture with BCG. BCG specific IL-22-producing NK cells from PFCs expressed CD45RO^high^ NKG2D^high^ granzyme B^high^.

In conclusion, our data demonstrated that memory-like antigen-specific CD45RO⁺ NK cells might participate in the recall immune response for M.tb infection via producing IL-22, which display a critical role to fight against M.tb.
PERFORMANCE OF THE INTERFERON GAMMA RELEASE ASSAY FOR DIAGNOSIS OF TUBERCULOSIS IN CHILDREN IN DIFFERENT AGES

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Background and aims

To analyze the performance of Interferon Gamma Release Assays (IGRAs) for diagnosis of tuberculosis in children in different age.

Methods

The diagnostic accuracy of IGRAs and TST were assessed in 205 children with active tuberculosis and 867 children with nontuberculous respiratory infection. Sensitivity, specificity and concordance were calculated. The diagnostic accuracy was analyzed by the area under the curve (AUC). The criterion for significance was set as \( P < 0.05 \).

Results

The sensitivity of IGRAs (85.4%, 175/205) was higher than TST test (81.5%, 167/205) in active TB children \( (c^2=1.128, P=0.288) \), especially who were younger than 1 year old (IGRAs: 80.0%, 24/30, TST: 53.3%, 16/30, \( c^2=0.03, P=0.054 \)). And the specificity of IGRAs was much higher than that of TST in each of the age subgroups (0~y, 99.1% vs.86.8%, \( c^2=12.125, P<0.001 \); 2~y, 93.9% vs.73.6%, \( c^2=41.603, P<0.001 \); 6~y, 92.2% vs.77.0%, \( c^2=23.948, P<0.001 \); 10~18y, 88.8% vs.65.6%, \( c^2=33.040, P<0.001 \)). AUC of IGRAs was much higher than that of TST in all groups except the 6-9 subgroup (0~y, \( P=0.001 \); 2~y, \( P=0.012 \); 6~y, \( P=0.1047 \); 10~18y, \( P<0.001 \)). The two test obtained low concordance in the enrolled subjects, kappa <0.40. In active tuberculosis children, the discordant IGRAs+/TST- results were mainly in younger children (0~y, 36.7%, 11/30). But in RTIs children, the discordant IGRAs-/TST+ results were mainly in older children (10~18y, 24.7%, 53/215). The overall proportion of indeterminate results was high (8.6%, 101/1173). The indeterminate rate of children older than 9 years old was significant lower than the other three groups (10.5% for 0~y, 10.0% for 2~y, 8.0% for 6~y, 6.8% for 10~18y, \( c^2=859.9, P < 0.001 \)).

Conclusions

IGRAs is a specific and sensitive tool for diagnosis of active tuberculosis.
SEROPOSITIVITY OF SYPHILIS, HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND HEPATITIS B VIRUS (HBV) IN PREGNANT WOMEN BY TRIPLE POINT-OF-CARE (POC) SCREENING

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Background: A harmonized approached called by World Health Organization (WHO) for elimination of mother-to-child transmission (EMTCT) of syphilis & HIV. Vertical transmission of these disease is major public health problem. Objective of this study was to determine the seroprevalence of syphilis, HIV & HBV in pregnant women.

Methods: Retrospective analysis of data was done from January, 2014 to December, 2016. Pregnant women attending Antenatal clinic in Sir Sayajirao General Hospital for routine checkup were counseled and consent was taken. Test was done from serum. Syphilis was tested by qualitative rapid plasmin reagin (RPR) for antibodies to Treponema Pallidum. Antibodies to HIV was tested by rapid card test and positive cases were confirmed by two more rapid card tests with two different principles as per strategy III of National program. HBV testing was done by rapid card test to detect Hepatitis B surface antigen.

Results: Total 19,533 women were screened. 64 tested positive for syphilis, 63 positives for HIV & 201 positive for HBV with seroprevalence rate of 0.33%, 0.32% & 1.03% respectively. Co-infection of syphilis & HIV was found in 17 (0.09%), syphilis & HBV in 11 (0.06%) and HIV & HBV in 8 (0.04%).
Conclusion: Study results indicates that seroprevalence of syphilis, HIV & HBV is low. However, further data from other sites & nationwide study is needed to substantiate this finding. Triple POC screening is highly efficient in screening and recommended to health professionals to effectively identify & treat seropositive mothers to prevent neonatal infection & achieve WHO’s goal of EMTCT.
**Prevalence of Renal Abnormalities in HIV-Infected Children and Adolescents – A Multicentric Study**

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**Background and aims**

Comorbidities may become more prevalent with increasing survival in HIV-patients.

We aimed to identify prevalence of renal abnormalities (RA) among HIV-infected children and associated risk factors.

**Methods**

Retrospective, multicentric, cross-sectional cohort study. RA patients had at least one criteria: proteinuria/hematuria in two subsequent samples; renal ultrasound (RU) or biopsy (RB) abnormalities; arterial hypertension and estimated glomerular-filtration-rate (eGFR) <90ml/min/1.73m² (Schwartz formula). Patients with and without RA were compared.

**Results**

We included 145 children: 61% females; median age 10.6 (IQR 4.4-15.6) years; 94% infected by mother-to-child transmission; 98% HIV-1; 86.9% on c-ART; actual viral load (AVL) undetectable in 67.7%. CDC immunological staging: 1-76%; 2-19.3%; 3-4.1%. HIV non-related and HIV-related comorbidities were present in 14% and 40% respectively.

RA were found in 24% (n=35): proteinuria 11%; eGFR<90mL/min/1.73m² 9.7%; hematuria 7.6%; altered RU 2.8%; altered RB 0.7%; hypertension 2.1%.

In a multivariate analysis, ongoing treatment with abacavir (OR 6.4, CI 1.4-29.8, p=0.018) or emtricitabine/tenofovir (FTC/TDF) (OR 5.4, CI 95% 1.0-28.5, p=0.045) were associated with RA. No patient with RA was on TDF without FTC (n=7). Patients with eGFR<90mL/min/1.73m², were predominantly males (p=0.047) or on treatment with FTC (p=0.042). No significant difference was found between groups respecting CD4 nadir and AVL.

**Conclusions**
About a quarter of our patients had RA, confirming the need for screening.

We found no correlation between RA and clinical/immunological severity, which may relate to the low number of severely immunosuppressed patients.

ABC and TDF/FTC were significantly associated with RA, and FTC, with or without TDF, with abnormal eGFR. TDF wasn’t independently associated with RA.
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THE ROLE OF STIGMA AND DISCRIMINATION IN EPISODIC MEDICATION ADHERENCE AND CLINIC ATTENDANCE; QUALITATIVE EXPLORATION WITH ADOLESCENTS WITH PERINATALLY ACQUIRED HIV IN BOTSWANA

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Background and aims

Maintaining adherence to antiretroviral therapy (ART) is a challenge for adolescents with perinatally acquired HIV (PHIV). Many adolescents take their ART medication inconsistently for various reasons. This study aimed to explore adherence to long term ART among adolescents with PHIV.

Methods

Adolescents with PHIV enrolled in the Infectious Disease Control Centre of a tertiary hospital in Francistown, Botswana participated in in-depth interviews. Thematic analysis of data aided by NVivo, version 10 was conducted.

Results

The sample consisted of 30 adolescents aged 12–19 years (mean age, 15.7 years). Most (19 out of 30) were on ART for 10 years and above. Sixteen reported inconsistency in taking ART medication. Cited barriers to adherence included the clash between school activities and scheduled clinic appointments, lack of transport money to access clinics, and stigma and discrimination. Fear of stigma was the main reason adolescents were inconsistent in taking medication. For adolescents out of home, the fear of being seen taking medication resulted in medication hiding and attempts to take medication in private, which resulted in not taking medication on scheduled times. Adolescents feared being seen collecting ART at the clinic, which affected keeping appointments for scheduled visits for ART refill and follow-up. Fear of stigma affected onward self-disclosure to significant others and friends, which perpetuated medication hiding.

Conclusions

Inconsistent adherence to ART was situational and adolescents had difficulty in adhering when particular conditions and contexts prevailed. It is imperative that healthcare providers understand the situational factors influencing adherence in developing strategies to support adolescents to adhere.
ACUTE POST-NATAL HYPOFERRAEMIA AND ITS ASSOCIATION WITH REDUCED BACTERIAL GROWTH: IDENTIFICATION OF A PHYSIOLOGICAL PROCESS WITH THERAPEUTIC POTENTIAL

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Background and aims

Neonatal sepsis remains a significant cause of morbidity and mortality throughout the world. Its control is threatened by the growing spread of anti-microbial resistance and novel therapeutics are urgently needed. Iron is necessary for pathogen virulence and reducing its availability is an important part of the innate immune response to infection. Previously, neonatal serum iron levels have been imputed from cord blood and assumed to be high. We investigated neonatal iron metabolism in the first 96 hours of life and conducted associated ex-vivo bacterial growth studies.

Methods

Blood samples taken from 120 healthy Gambian neonates from birth up to 96 hours of age were analysed for iron parameters, hepcidin and IL-6. Samples pooled according to transferrin saturation were used to conduct ex-vivo bacterial growth assays with Streptococcus agalactiae, Staphylococcus aureus, Klebsiella pneumonia and Escherichia coli.

Results

A profound reduction in transferrin saturation occurred within the first 12 hours of life, from 47.6% (95% CI 43.7-51.5%) in cord blood to 24.4% (21.2-27.6%) by 12 hours of age. These levels remained suppressed to at least 48 hours of age and correlated with increased hepcidin and IL-6. Ex-vivo growth of common neonatal pathogens was lower in hypoferraemic post-natal sera than in cord blood.

Conclusions

Physiological reductions in serum iron, demonstrated here in healthy neonates, may be an evolved mechanism to protect infants from microbial challenge in the immediate post-natal period. Augmenting this hypoferraemia, for instance with mini-hepcidins, may represent a novel therapeutic target that is not vulnerable to anti-microbial resistance.
GLOBAL ANTIMICROBIAL RESISTANCE, PRESCRIBING, AND EFFICACY IN NEONATES AND CHILDREN (GARPEC) NETWORK: POINT PREVALENCE SURVEYS IN CHINESE CHILDREN

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Background and aims

There is currently limited evidence on the use of antibiotics for children in China. Gaps in knowledge about the use of antibiotics in hospitalized children in China must be addressed to inform the implementation of effective stewardship activities. The aim of this study was to characterise antibiotic prescribing patterns in hospitalized children in China.

Methods

The GARPEC project facilitates global standardized surveillance for antibiotic use in children and neonates. Through GARPEC, four Point Prevalence Surveys (PPSs) of antibiotic prescribing were conducted in China between February 2016 and February 2017. Demographic and clinical data were collected, as well as information on drug, dose, and mode of administration for antibiotics among children on participating wards at 8am on the day of the PPS. A web-based surveillance system was used for data collection.

Results

A total of 18 Chinese hospitals were participated, including 2,130 children (male: 60.4%; 1,287/2,130). There was approximately 32.2% (685/2,130) of children received more than one antibiotic during the study period. Overall, the most commonly prescribed antibiotics were azithromycin (13.4% of total use of antibiotics), latamoxef (8.2%), and ceftriaxone (8.1%) among hospitalised children (Figure 1). The most recorded reasons for antibiotic prescribing were lower respiratory tract infection (56.4%), upper respiratory infection (9.8%), followed by viral lower respiratory tract infection (5.5%).
Conclusions

This study has set the benchmarks and to establish a sustainable paediatric antibiotic use surveillance network in China. There is a need to further assess the rationale behind the selection of the current antibiotics use in Chinese children.
IMPACT OF KETOGENIC DIET ON GUT MICROBIOTA PROFILES IN INFANTS WITH REFRACTORY EPILEPSY

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Background and aims

Previous studies suggested that both genetic and environmental factors could trigger epilepsy, but the etiology remained unexplored and a large of patients with epilepsy were refractory to conventional therapy. Ketogenic diet (KD) is widely used for refractory epilepsy control. Growing reports identified involvement of gut microbiota(GM) in neurodevelopment and neurological diseases. However, little reports unraveled imbalanced GM in refractory epilepsy and how KD affected GM.

Methods

The observational study presented involved 14 children with refractory epilepsy. We concurrently enrolled 30 age-matched healthy controls. Fecal samples were obtained from children with refractory epilepsy(before and after KD-treatment) and healthy children. Bacterial DNA was extracted from stool samples, PCR amplification was performed on 16S rRNA gene regions, and PCR amplicons were sequenced using Illumina Miseqsequencer.

Results

After KD treatment for a week, 64% of diseased children had an obvious improvement, with >50% seizures frequency decreasing. GM structure in epileptic infants differed dramatically among individuals, and healthy subjects harbored similar GM composition. Proteobacteria accumulated significantly in diseased children and decreased dramatically after KD treatment. Cronobacter was dominated in epileptic infants (P1 group) and kept low level in healthy and after-therapy children. After KD therapy(P2 group), Bacteroides increased significantly as healthy children. Prevotella and Bifidobacterium were also accumulated in healthy group and kept increased after KD therapy.

Conclusions

Alleviation of epilepsy seizures might be related to the alteration of GM pattern. This study provides a new insight to understand how the KD remits epilepsy symptoms, and suggests that GM variation is related to refractory epilepsy recovery.
Background and aims
Glycocalyx degradation is associated with increased capillary permeability and extravasation of fluid, which is related to worse outcome. Syndecan-1, a valid marker of glycocalyx integrity, is stimulated by mediator of inflammation which causes its shedding into blood circulation. Study on syndecan-1 in septic children is very limited and we have not found any reference value of syndecan-1 in neither normal nor septic pediatric population before this study. This study aimed to investigate the level of syndecan-1 in septic children admitted to pediatric ICU.

Methods
A longitudinal prospective study with repeated cross-sectional design on septic children was conducted at three teaching hospitals in Indonesia from March to December 2015. We examined serum syndecan-1 level of septic patients in pediatric intensive care unit on day 1, 2, 3 and 7. Syndecan-1 level of healthy children was examined as control group.

Results
Thirty healthy subjects and 49 septic subjects were recruited. Syndecan-1 was increased in septic group compared to healthy group [83.40 (10.10–2257.91) ng/mL vs. 27.7 ± 2.24 ng/mL; p<0.001]. The value of 90th percentile level in healthy children was 41.42 ng/mL and 40 (81.6%) septic subjects had syndecan-1 > 41.42 ng/mL on day 1. Median value of syndecan-1 was increased by the day in septic patients, but there was no statistically significant difference (p = 0.170).

Conclusions: Syndecan-1 level was increased in septic children compared to healthy children, indicated significant shedding of endothelial glycocalix in septic children admitted to pediatric ICU.
DEEP NECK SPACE INFECTIONS IN A PEDIATRIC INTENSIVE CARE UNIT: A RETROSPECTIVE STUDY FROM INDIA
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Background and aims

Deep neck space infections (DNSI) are life-threatening, requiring intensive care and multidisciplinary interventions for good outcome. Data on children with DNSI from developing countries is scarce.

Objectives: To study the clinical profile, intensive care needs, outcome and predictors of outcome of children with DNSI admitted to a pediatric intensive care unit (PICU).

Methods

Case records of 44 children below 12 years with DNSI admitted to a PICU of a tertiary care hospital between January 2012 to June 2017. Survivors and non-survivors were compared with univariate and multivariable analysis.

Results

Median (IQR) age of children was 13.5 (9, 26) months with 24 (54.5%) boys. Median (IQR) duration of illness was 6 (5, 11) days, neck swelling (93.2%) and fever (90.9%) being predominant symptoms. Parapharyngeal and retropharyngeal were commonest in 17 (38.6%). Computed tomography (CT) alone confirmed diagnosis in 19 (43.2%), combined with ultrasonography in 17 (38.6%) and MRI in 2 (4.5%). PICU needs were intubation in 17 (38.6%), tracheostomy in 12 (27.2%) and ventilation in 4 (9%). Most needed incision and drainage at a median (IQR) duration of 24 (14,48) hours of admission. Organism was isolated in 13 (29.5%), commonest being MSSA and MRSA in 3 (6.8%). Septic shock was seen in 7, mediastinitis in 5, internal jugular vein thrombosis in 4 and carotid pseudoaneurysm in 1. Physiological derangement at presentation was major determinant of death.

Conclusions

Parapharyngeal and retropharyngeal abscesses are the most common DNSI. CT is essential before definitive management. Physiological derangement at presentation predicts mortality.
PATHOGENIC ANALYSIS OF PEDIATRIC BACTERIAL MENINGITIS IN CEREBROSPINAL FLUID BY NEXT GENERATION SEQUENCING TECHNOLOGY
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7Key Laboratory of Major Diseases in Children and National Key Discipline of Pediatrics Capital Medical University- Ministry of Education- National Clinical Research Center for Respiratory Diseases- Beijing Key Laboratory of Pediatric Respiratory Infection Diseases- Beijing Pediatric Research Institute- Beijing Children’s Hospital- Capital Medical University, Laboratory of Microbiology, Beijing, China

Background and aims

Bacterial meningitis remains one of the major challenges in infectious diseases, leading to sequel in many cases. However, a prompt diagnosis of the causative microorganism is critical to significantly improve outcome of bacterial meningitis. Although various targeted tests for CSF samples are available, time-consuming CSF culture-based approaches still represent the standard of care for the identification of bacteria.

Methods

Here we describe the establishment of a complete diagnostic workflow for the identification of infectious microorganisms in cerebral spinal fluid samples of pediatric bacterial meningitis patients in the department of infectious diseases from Beijing Children’s Hospital based on unbiased sequence analyses by next-generation sequencing (NGS).

Results

In total, we had 99 bacterial meningitis patients in our study. Combined with NGS, 68.7% (68 cases) were etiologically confirmed. 55 (55.6%) cases were etiologically confirmed by clinical microbiology methods. 34 (34.3%) cases were etiologically confirmed by NGS. We also identified species from samples where blood and/or CSF cultures were negative. Two cases with cytomegalovirus infection and one with Taeniasaginataasiatica were confirmed by NGS. The main pathogens identified in this study were Streptococcus pneumoniae (n=27, 37.5%), group B streptococcus (n=15, 20.8%), Staphylococcus aureus (n=7, 9.7%), Escherichia coli (n=7, 9.7%).

Conclusions
NGS can be a promising alternative diagnostic platform for critically ill patients suffering from bacterial meningitis pediatric patients.
Background and aims

Pertussis continues causing significant morbidity and mortality worldwide. This review summarizes recent data concerning pertussis in a country of South America, Brazil in the period from 2010 to 2016. Maternal immunization was included in the national schedule in 2014.

Methods

Brazilian Health definition was used for pertussis diagnosis. Proportion of pertussis cases by age, was evaluated at the Brazilian National Pertussis Reference Centers in the period of 2010 to 2016.

Results

There were a total of 26,375 pertussis confirmed cases from 2010 to 2016 with 788 fatal cases (3.4%). Most of these cases correspond to patients younger than six months old (around 50% of the confirmed cases). From the year of 2010, a steady increase of pertussis cases was observed. In 2010 the incidence was 0.3 /100,000. The incidence increased and reached 4.2/100.000 in 2014. In 2014 maternal acellular pertussis vaccine was included in the national immunization schedule. After this the incidence rate of pertussis decreased to 1.5/100.000 in 2015 and 1.49/100,000 in 2016. Number total of deaths was highest in 2013 and 2014 with 109 and 110 fatalities. In 2015 and 2016 the numbers decreased to 33 and 7 respectively.
Conclusions

Pertussis is an important problem for public health in Brazil because the high fatality rate in infants. The number of new cases decreased in the last two years after inclusion of maternal acellular pertussis vaccine in the national immunization schedule.
IS VALIDATION OF REGISTER-BASED DATA NEEDED? COMPARING ASSOCIATION BETWEEN PANDEMIC VACCINE AND NARCOLEPSY BASED ON PATIENT FILE-VERIFIED AND REGISTER-BASED DATA IN FINLAND

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Background and aims

Register-based studies are often criticized for poorly specific/sensitive outcomes. We investigated the validity of register-based research with a vaccine safety study, testing the association between a rare sleep disorder narcolepsy and Pandemrix vaccine introduced to control the A(H1N1) pandemic in October/2009.

Methods

In this retrospective population-based cohort study, incidence of narcolepsy was compared between vaccinated and unvaccinated after the pandemic vaccination campaign. In the original studies, the outcome data were collected from the nationwide register containing all inpatient and outpatient diagnoses (ICD10-code G47.4) in Finnish hospitals, after which the patient files were collected, and two sleep-disorder experts independently verified the diagnoses. These results were compared with the current analysis with the register data only.

Results

In children aged 4-19 years at vaccination, the estimated relative risk by the end of 2010 based on ICD10-code only (9.1, 95%CI 3.4-37.1) was very similar to the one with patient-file verified cases (12.8, 95%CI 4.0-77.9). In addition, in young adults 20-40 years, the register-based relative risk by the end of 2011 was 3.5 (95%CI 2.1-6.3), with most cases in 2011. This is in line with the subsequent patient-file verified study in adults, in which no association was observed by the end of 2010, but 3 to 5-fold elevated risk was reported when the diagnosed cases during 2011 were included.

Conclusions

Regardless of suggested shortcomings, the magnitude of the association in children was accurately estimated using register data only. In addition, register outcome was sensitive enough to observe the association also in adults, with much fewer cases.
THE BURDEN OF PERTUSSIS IN LOW AND MIDDLE INCOME COUNTRIES SINCE THE INCEPTION OF THE EPI IN 1974: A 40-YEAR SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims

Trends in the burden of pertussis in low-and-middle-income countries (LMICs) are largely missing making it difficult to review and amend pertussis control policies.

We systematically reviewed published literature on the burden of laboratory-confirmed pertussis in LMICs since the inception of the EPI.

Methods

Common and MeSH terms for pertussis were used to search electronic databases for relevant literature published between 1974 and 2014. Only studies from LMICs with PCR or culture-confirmed suspected pertussis cases were included if they contained clear numerators and denominators.

Standardized data extraction was carried out to determine prevalence and mortality rate due to *Bordetella pertussis*.

Results

37 studies involving 14881 subjects were included. Overall prevalence of PCR-confirmed pertussis was 18% (95% CI 13-24%). Prevalence differed by WHO region and ranged from 7% (95% CI 4 - 11%) in the African region to 35% (95% CI 12 - 62%) in the Western Pacific. Culture-confirmed prevalence was 5% (95% CI 3-8%), ranging from 3% (95% CI 1-5%) in South-East Asia to 11% (95% CI 3-23%) in the Region of the Americas.

Prevalence of pertussis was higher in populations using aP [22% (95% CI 13 - 33%)] than in those using wP [13% (95% CI 9 - 17%)]. Mortality rate in studies reporting death was 1.6% (95% CI 1.1 – 2.2) with 75% occurring before 6 months of age.
Figure 1. Prevalence of confirmed Bordetella pertussis by World Health Organisation region using Polymerase chain reaction (A) and culture (B)
Conclusions

Despite availability of effective vaccination, prevalence of pertussis in LMIC remains high with significant infant mortality.

Table: Studies reporting *Bordetella pertussis* associated deaths (N=2623)

<table>
<thead>
<tr>
<th>Study</th>
<th>Deaths</th>
<th>Cases</th>
<th>Mortality rate</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voorhoeve, n=1078</td>
<td>12</td>
<td>137</td>
<td>1.1 (0.6-1.9)</td>
<td>8.8 (4.6-14.8)</td>
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<tr>
<td>Guevara, n=759</td>
<td>15</td>
<td>178</td>
<td>2.0 (1.1-3.2)</td>
<td>8.4 (4.8-13.5)</td>
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<tr>
<td>Zouari, n=599</td>
<td>8</td>
<td>112</td>
<td>1.3 (0.6-2.6)</td>
<td>7.1 (3.1-13.6)</td>
</tr>
<tr>
<td>Karlh, n=40</td>
<td>2</td>
<td>6</td>
<td>5.0 (0.6-16.9)</td>
<td>33.3 (31.3-13.6)</td>
</tr>
<tr>
<td>Ochoa-Perez, n=147</td>
<td>5</td>
<td>59</td>
<td>3.4 (1.1-7.8)</td>
<td>8.5 (2.8-18.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>42</td>
<td>492</td>
<td>1.6 (1.1-2.2)</td>
<td>8.5 (6.2-11.4)</td>
</tr>
</tbody>
</table>
THE BACTERIAL MENINGITIS SURVEILLANCE IN HO CHI MINH CITY, VIETNAM

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Background and aims

Bacterial meningitis is a serious public health problem in developing countries. Invasive Bacterial Vaccine Preventable Diseases (IB-VPD) surveillance program, coordinated by World Health Organization, has been implemented since 2012 to identify and characterize three pathogens causing majority of bacterial meningitis in children: *Streptococcus pneumoniae*, *Neisseria meningitidis*, and *Haemophilus influenzae*. The aims are to measure a vaccine impact and to provide evidence to Ministry of Health for introduction of vaccines.

Methods

The surveillance was conducted in Ho Chi Minh City with two sentinel sites in children under 5-years of age. Cerebrospinal fluid (CSF) samples were collected from Children Hospital 1 and 2 with the meningitis symptoms. The samples were cultured and agglutinated at hospitals' laboratories and transported to Pasteur Institute for deoxyribonucleic acid (DNA) extraction and identification of pathogens by real time polymerase chain reaction (PCR). Serotyping and serogrouping were performed by realtime PCR for *N. meningitidis*, *H. influenzae* and conventional multiplex PCR for *S. pneumoniae*.

Results

From 2012 to 2016, 1059 CSF samples were collected, with positivity rate close to 10%. *S. pneumoniae* was predominant with (78%) as only pathogen detected since 2015. Serotype distribution of *S. pneumoniae* was 6A/B and 19F (29% each); 23F (11%); 14 (9.6%); 9V (1.4%); non conjugate-vaccine types 11A/D (4%), 15A/F, 15B/C and 19A (2.7% each). Serotype prevalence of *H. influenzae* was b (69%) and non-typeable (NT) Hi (31%), and of *N. meningitidis* was B and C with 50% each.

Conclusions

The surveillance program plays an important role in providing data for introduction of new vaccines, especially pneumococcal vaccine in Vietnam.
Potential impact of B lineage mismatch on trivalent influenza vaccine effectiveness during the 2015-2016 influenza season among nursery school children in Suzhou, China

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**Background:** We actively followed a cohort of nursery school children in Suzhou, China to assess the impact of vaccination with trivalent influenza vaccine on the prevention of influenza like illness (ILI).

**Methods:** We enrolled children aged 36 to 72 months from 13 nursery schools in Suzhou starting two weeks after vaccination during October 2015-February 2016. Every school-day, teachers reported the names of students with ILI to study clinicians, who collected the student’s nasopharyngeal swab or throat swab, either at a study clinic or the child’s home. Swabs were sent to the Suzhou Center for Disease Control and Prevention’s laboratory for influenza testing by RT-PCR.

**Results:** In total, 3278 children were enrolled; 83 (3%) were lost to follow-up, while 3195 (vaccinated: 1492, unvaccinated: 1703) were followed for 24 weeks. During the study, 40 samples tested positive; 17 in the vaccinated (B Victoria: 12; A(H1N1)pdm09: 5) and 23 in the unvaccinated group (B Victoria: 10; B Yamagata: 2; A(H1N1)pdm09: 11). The VE estimates were: 16% overall (95%CI: -58%, 56%), 48% (-47%, 84%) for influenza A(H1N1)pdm09, 43% (-650%, 98%) for influenza B Yamagata, and -37% (-227%, 42%) for influenza B Victoria. Data were analyzed by vaccinated and unvaccinated groups based on enrollees’ vaccination records.

**Conclusions:** The VE for A(H1N1)pdm09 was moderate but not significant. Mismatching of B lineage may have compromised trivalent influenza vaccine effectiveness during the 2015-2016 influenza season among nursery school children in Suzhou, China. Additional larger studies are warranted to inform policy related to quadrivalent influenza vaccine licensure in China in the future.
Influenza-associated hospitalization among children less than five years of age in Suzhou, China October 2011- September 2016

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OBJECTIVES: To estimate the burden of influenza-associated severe acute respiratory infection (SARI) hospitalizations in Suzhou among children less than five years of age from October 2011 to September 2016.

METHODS: We conducted prospective severe acute respiratory infection (SARI) surveillance within Suzhou University Affiliated Children’s Hospital (SCH), and healthcare utilization surveys (HUS). We combined weekly virologic data with population information from Suzhou’s immunization program database and data from HUS to estimate influenza-related hospitalizations in Suzhou.

RESULTS: The estimated annual influenza-associated SARI hospitalization rates per 1,000 children <5 years of age were: 42.2 (95% Confidence Interval [CI]: 39.1-45.2) in the 2011-2012 season, predominantly caused by influenza A/H3N2 subtype (59.2%); 8.4 (95% CI: 7.5-9.4) in the 2012-2013 season, predominantly caused by influenza B (45.8%); 23.2 (95% CI: 20.7-25.6) in the 2013-2014 season, predominantly caused by influenza A/H3N2 subtype (71.2%); 15.2 (95% CI: 13.2-17.2) in the 2014-2015 season, predominantly caused by influenza A/H3N2 subtype (54.5%); and 13.8 (95% CI: 12.5-15.2) in the 2015-2016 season, predominantly caused by influenza A/H1N1 subtype (50%) and influenza B (50%). The age-specific influenza-associated SARI hospitalization rates over the 5-year period were 31.0 (95% CI: 27.6-34.5) per 1,000 children <6 months; 21.8 (95% CI: 18.2-25.5) per 1,000 children aged 6-23 months; and 11.8 (95% CI: 10.4-13.2) per 1,000 children aged 24-59 months respectively.

CONCLUSIONS: Our findings highlight the importance of improving influenza prevention and control strategies for young children, and particularly for infants <6 months, for whom prevention methods include immunizing pregnant women and caregivers.
PREVALENCE AND INCIDENCE OF HIGH-GRADe PAPANICOLAOU (PAP) TEST ABNORMALITIES ASSOCIATED WITH 14 HPV TYPES IN WOMEN PARTICIPATING IN QUADRIVALENT HPV VACCINE CLINICAL TRIALS

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2Duke, Obstetrics & Gynecology, Durham, USA
3Merck, HPV Vaccines, Kenilworth, USA

Background: Few studies have reported the burden of Pap abnormalities associated with HPV types targeted by HPV vaccines.

Objective: To estimate HPV anogenital infection prevalence among women with high-grade Pap abnormalities, and incidence of high-grade abnormalities by baseline infection status, in participants of 3 worldwide trials of the quadrivalent HPV vaccine (FUTURE I, II, and III).

Methods: Prevalence of anogenital HPV infection was estimated for 157 of 16,949 women ages 15-26 (FUTURE I, II) and 30 of 3,674 women ages 25-45 (FUTURE III) with high-grade Pap abnormalities at enrollment. Incidence of high-grade abnormalities, by baseline HPV status, was estimated for 1,481 young (FUTURE I) and 1,701 adult (FUTURE III) women.

Results: At baseline, prevalence of 9-valent (9v) HPV vaccine types (6/11/16/18/31/33/45/52/58) in high-grade abnormalities was 89% (young women) and 93% (adult women). Prevalence of any non-vaccine types (35/39/51/56/59) was 47.1% (young) and 37.9% (adult), but prevalence of only non-vaccine types was 3.9% (young) and 3.4% (adult). Cumulative incidence high-grade abnormalities over 48 months was 8% (young) and 6% (adult) among women with any 9v type at baseline, and 5% (young) and 3% (adult) among women with only non-vaccine types at baseline.

Conclusions: While the 9v vaccine will substantially reduce high-grade Pap abnormalities associated with HPV types that cause 90% of cervical cancers, some non-vaccine types also contribute to Pap abnormalities. These findings underscore the need for vaccination to protect against 9v types, as well as the ongoing need for cervical screening.
GLOBAL ROTAVIRUS VACCINE INTRODUCTIONS AND COVERAGE, 2006-2016
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¹The Chinese University of Hong Kong, Department of Paediatrics, Hong Kong, Hong Kong S.A.R.
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³Bill and Melinda Gates Foundation, Enteric and Diarrhoeal Diseases- Global Health, Seattle, USA
⁴Centers for Disease Control and Prevention, Division of Viral Diseases- National Center for Immunization and Respiratory Diseases, Atlanta, USA
⁵PATH, Center for Vaccine Innovation and Access, Seattle, USA

Background and aims

An estimated 215,000 rotavirus deaths occur each year (92% in low and lower-middle income countries) and approximately 2 million infants and children are hospitalized. This review compares rotavirus vaccine (RV) introductions, vaccine coverage, vaccine access, and utilization by WHO region, country income status and Gavi-eligibility from 2006-2016.

Methods

Gross National Income data from the World Bank and surviving infant population from United Nations Population Division was obtained for 2016. Data on rotavirus vaccine coverage, national immunization schedules, new vaccine introductions, and estimated rotavirus deaths were collected from the World Health Organization (WHO). Indicators were generated based on the RV dose 1 coverage and drop-out rate to evaluate the access and utilization of rotavirus immunization services.

Results

As of December 2016, 110 (57%) countries had not introduced universal rotavirus vaccine despite WHO’s 2009 recommendation to do so. African countries had the greatest proportion of introductions (37%, 31/84) and a great majority of these (77%, 24/31) were supported by new vaccine introduction (NVI) grants from Gavi. Almost half (46%) of global introductions were in low and lower-middle income Gavi-eligible and Gavi-graduating countries. Conversely, countries in the South East Asia WHO region and those not eligible for Gavi NVI support have been slow to introduce rotavirus vaccine.

Conclusions

High income countries, on average, had poorer rotavirus vaccine coverage compared to low and lower-middle income countries. The over-representation of African countries within the Gavi subset and high estimated rotavirus deaths in these African countries, likely explains why introduction efforts have been focused in this region.
**INCREMENTAL EFFICACY OF AN INVESTIGATIONAL PNEUMOCOCCAL PROTEIN-BASED VACCINE CO-ADMINISTERED WITH PCV13 AGAINST ACUTE OTITIS MEDIA: A PHASE 2 RANDOMIZED CLINICAL TRIAL IN NATIVE AMERICAN INFANTS**


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2 GSK, Vaccines, Wavre, Belgium
3 XPE Pharma & Science, on behalf of GSK, Wavre, Belgium

**Background and aims**

Native American infants have high rates of pneumococcal disease despite use of highly effective pneumococcal conjugate vaccines (PCVs). Pneumococcal protein-based vaccines may broaden protection beyond serotype-specific efficacy elicited by PCVs. We evaluated the incremental efficacy (over 13-valent PCV [PCV13]) of an investigational pneumococcal protein-based vaccine, containing pneumolysin toxoid (dPly, 10 micrograms) and histidine-triad protein D (PhtD, 10 micrograms), against acute otitis media (AOM) and acute lower respiratory infection (ALRI) in Native American infants.

**Methods**

In this phase 2, double-blind, controlled trial (NCT01545375), infants aged 6-12 weeks were randomized 1:1 to receive dPly/PhtD vaccine (N=900) or placebo (N=903) at ages 2, 4, 6 and 12-15 months, each co-administered with PCV13. Other pediatric vaccines were given per the routine immunization schedule. We assessed dPly/PhtD vaccine efficacy (VE) against all episodes of clinically diagnosed AOM meeting American Academy of Pediatrics criteria (AAP-AOM; primary objective) and other AOM and ALRI endpoints.

**Results**

VE against all AAP-AOM episodes was 3.8% (95% CI: -11.4, 16.9; p=0.30) and did not meet the predefined success criterion (1-sided alpha=0.18). VE ranged from 2.9% to 11.3% for AOM endpoints and from -4.4% to 9.3% for ALRI endpoints (table).
Table. Vaccine efficacy (VE) against clinical acute otitis media and against acute lower respiratory tract infections per protocol analysis (modified ATP cohort for efficacy: episodes occurring from 2 weeks post-dose 3 up to age 24-27 months)

<table>
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<tr>
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<tr>
<td></td>
<td>Number of episodes (incidence*)</td>
<td>VE (95% CI)</td>
</tr>
<tr>
<td></td>
<td>Interventional (dPly/PhtD + PCV13)</td>
<td>Control (Placebo + PCV13)</td>
</tr>
<tr>
<td></td>
<td>N=808</td>
<td>N=831</td>
</tr>
<tr>
<td>AAP-AOM</td>
<td>485 (0.425)</td>
<td>518 (0.442)</td>
</tr>
<tr>
<td>Modified</td>
<td>648 (0.567)</td>
<td>702 (0.599)</td>
</tr>
<tr>
<td>AAP-AOM</td>
<td>774 (0.678)</td>
<td>819 (0.699)</td>
</tr>
<tr>
<td>HCP-AOM</td>
<td>163 (0.143)</td>
<td>165 (0.141)</td>
</tr>
<tr>
<td>MA-ALRI</td>
<td>125 (0.109)</td>
<td>123 (0.105)</td>
</tr>
<tr>
<td>MA-ALRI with fever</td>
<td>289 (0.253)</td>
<td>303 (0.259)</td>
</tr>
</tbody>
</table>

Note: Per-protocol analysis included episodes occurring from 2 weeks post-dose 3 up to child's last visit or censoring date. The modified ATP cohort for efficacy includes the according-to-protocol cohort for efficacy plus children who completed 3-dose primary vaccination but the intervals between the 3 primary doses were not according to protocol. Of 809 children included in the modified ATP cohort for efficacy, one was censored before vaccine dose 3 and was not included in the per-protocol analysis. N, number of children; CI, confidence interval; AAP-AOM, clinical acute otitis media diagnosed and verified against American Academy of Pediatrics criteria (2004), meeting all of the following criteria: (1) history of acute onset of signs and symptoms of middle-ear inflammation and middle-ear effusion (MEE) and (2) at least one of the signs and symptoms of middle-ear inflammation (i.e. distinct erythema of the tympanic membrane or distinct otalgia). AND (3) at least one of the MEE signs: (i.e. bulging of the tympanic membrane, limited or absent tympanic membrane mobility, air-fluid level behind the tympanic membrane, or otorrhea); modified AAP-AOM, clinical AOM diagnosed and verified against modified AAP criteria, that refer to (1) a history of acute onset of signs and symptoms of middle-ear inflammation and MEE AND (2) signs/symptoms of middle-ear inflammation (i.e. erythema of the tympanic membrane) OR at least one of the MEE signs (i.e. bulging of the tympanic membrane, limited or absent tympanic membrane mobility, air-fluid level behind the tympanic membrane, or otorrhea). HCP-AOM, healthcare provider-diagnosed clinical AOM; MA-ALRI, medically attended acute lower respiratory tract infection; MA-HCP-ALRI, medically attended healthcare provider-diagnosed ALRI. *episodes/person-year. **Confirmatory objective success criterion: 1-sided α-value = 0.18 for the null hypothesis H0=[clinical AOM VE ≤ 0%] at end-of-study analysis.

Conclusions

Incremental efficacy of dPly/PhtD vaccine against all episodes of AAP-AOM over PCV13 was not demonstrated. VE against first AOM and ALRI episodes tended to be greater than against all episodes.

Funding: GlaxoSmithKline Biologicals SA
Latent tuberculosis infection (LTBI) represents a substantial public health burden. This study was conducted to determine the frequency of LTBI in children by using QuantiFERON-TB Gold in-tube test (QFT-GIT) in children less than 12 years of age in a tertiary care centre, Lahore.
WSPD7-0076
EPOSTERS DECEMBER 2-5 - 09:45-17:00
CHILDHOOD TUBERCULOSIS

ACCEPTABILITY OF NASOPHARYNGEAL ASPIRATION AS A TOOL TO DIAGNOSE TUBERCULOSIS AMONG CHILDREN IN A COMMUNITY SETTING IN THE PHILIPPINES

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²University of the Philippines Manila, National Teacher Training Center for the Health Professions, Manila, Philippines

Background

Diagnosis of childhood tuberculosis (TB) requires gastric lavage (GL) and induced sputum (IS), but these require overnight hospitalization, trained personnel and special equipment to perform. Nasopharyngeal aspiration (NPA) uses minimal equipment and training and may be an alternative in communities with limited resources.

Objective

To describe the acceptability of nasopharyngeal aspiration as a TB diagnostic procedure among pediatric TB suspects in a community in the Philippines.

Methods

In a field study to enhance childhood TB identification, children with presumptive pulmonary TB were included for NPA. One trained staff performed the procedure while another served as observer. The Face, Legs, Activity, Cry, Consolability (FLACC) scale and the Faces Pain Scale-revised© (FPS-R) were used to measure pain in children ≤ 3 years and in children >3 years, respectively. Both scales were scored from 0 to 10 with 0 representing no pain. After the procedure, a questionnaire was administered to the parent of the subject and when applicable, to the subject himself.

Results

From August 18, 2015 to May 29, 2017, NPA in 280 children was performed, 150 (54%) were males and the mean age was 57 months (median 48, range 3 – 168). The mean FLACC score was 3.7 while the mean FPS-R score was 3.1. Of the children who could communicate (N=73), 95% would allow the procedure to be repeated and 92% said it was not painful.

Conclusions

Nasopharyngeal aspiration appears to be an acceptable procedure to parents and children TB suspects to diagnose childhood TB in a community setting.
CASE REPORT: BCG OSTEOMYELITIS IN AN IMMUNOCOMPETENT CHILD

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¹Irmandade Da Santa Casa De Misericordia De Sao Paulo, Pediatric Infectious Disease, Sao Paulo, Brazil

Background and aims

BCG vaccine can prevent severe and disseminated tuberculosis (TB). Common side effects occur at the administration site but osteomyelitis (OM-BCG) is a rare and potentially serious complication with variable incidence. Clinical course is usually benign, but late sequelae may occur.

Methods

A 7-month healthy girl, born in São Paulo presents with edema, pain and antalgic position in right wrist for 10 days, without local tenderness. No trauma was reported and clinical examination was unremarkable. An osteolytic lesion in the distal third of the ulna was seen in plain radiograph while MRI demonstrated an expansive formation with soft tissue involvement. Puncture biopsy was performed, revealing loose epithelioid granulomas, fibrinoid necrosis areas permeated by granulation tissue and rare acid-alcohol fast bacilli; Mycobacteria culture was negative. The patient was then referred to our service with normal physical examination. TB investigation in the family was negative. She was a TST non-reactor and anti-HIV was negative; no humoral and cellular immunodeficiency detected. Tuberculous osteomyelitis was assumed so isoniazid, rifampicin and pyrazinamide was given for 2 months then maintained as rifampicin-isoniazid regimen. OM-BCG was raised but treatment was not changed due to favourable clinical and radiological evolution. Currently she is in the 5th month of treatment.

Conclusions

OM-BCG in immunocompetent patients usually has favourable outcome. Vaccine strain virulence and immune system status are risk factors. Combination therapy including isoniazid and rifampicin for 6-12 months is be suggested as initial treatment.
Background and aims

The tuberculosis (TB) epidemic situation is very grim. The childhood tuberculosis infection situation is complicated and the diagnosis is often difficult. Therefore, a fast and accurate method for diagnosis is very important for TB control and treatment. The study was designed to explore the value of T-SPOT in the diagnosis of TB in children, by comparing results with TST, PCR, and tuberculosis antibodies those are currently commonly used to study their differences in diagnosis efficiency.

Methods

233 cases of children suspected tuberculosis infection were diagnosed, treated and collected from at Children's Hospital of Chongqing Medical University China from December 2013 to June 2015. We then analyzed the diagnostic efficiency of TST, tuberculosis antibody, PCR and T-SPOT under different influencing factors and risk classification

Results

The sensitivity, specificity, positive predictive value and negative predictive value of T-SPOT.TB in the diagnosis of children with tuberculosis were 90.4%, 83.2%, 83.7% and 90%, respectively. The sensitivity, negative predictive value and the sensitivity in the three risk grades were higher than the other three methods. The results of T-SPOT: TB was influenced by age. Combined with one different methods can improve the specificity of diagnosis (p<0.05).

Conclusions

T-SPOT.TB has the high sensitivity and acceptable specificity, and was not effected by the vaccination and hormone. It has the better diagnostic efficacy for both internal and external pulmonary tuberculosis, Could be used as an important diagnostic tool for children's tuberculosis. T-SPOT.TB has a certain value for the diagnosis of latent tuberculosis, Multiple methods combined can improve the detection specificity.
MEDISTINAL LYMPHADENOPATHY: CHALLENGES IN DIFFERENTIAL DIAGNOSIS

C. Cristina¹, M. Oliveira¹, M.J. Brito¹, C. Gouveia¹
¹Hospital Dona Estefânia. CHLC – EPE, Pediatric Infectious Diseases Unit, Lisbon, Portugal

Background and aims

Portugal has an incidence of tuberculosis of 18/100000 habitants, however, in urban areas and immigrant communities it is higher. Diagnosis requires a high level of suspicion.

Results

15-year-old previously healthy male born in Guinea, living in Lisbon for two years, was admitted with sternal, cervical and lombar pain for one month. He also referred low grade fever, asthenia, anorexia and unquantified weight loss. He was emaciated, with sternal edema and pain on palpation. Also, cervical and lumbar spine were painful on mobilization. Lab tests revealed a normal CBC, CRP 24.5mg/dl, ESR 60mm/h. IGRA-Quantiferon was negative but IGRA T-SPOT was positive and HIV negative. BK staining, culture and nucleic acid amplification tests were negative on sputum. Chest, abdominal and pelvic CT showed a para-aortic adenopathy conglomerate (90x41x49mm) with central necrosis and multiple spleen nodules. Spinal MRI demonstrated T2 diffuse hypersignal and edema of C3, D11 and L3 vertebral body. Biopsy of mediastinal lymphadenopathy revealed a necrotizing granulomatous inflammatory process. BK staining and molecular amplification on the biopsy were negative. Empirical anti-tuberculosis therapy was started. Later, cultural exam of biopsy identified Mycobacterium tuberculosis, confirming presumed diagnosis.

Conclusions

Differential diagnosis of mediastinal lymphadenopathy is challenging. Definite diagnosis of tuberculosis requires a positive BK staining, molecular amplification or cultural tests. However, owing to the paucibacillary nature of the specimens, the sensitivity of these tests are low. Despite useful, sensitivity of IGRA tests is not established in extrapulmonary tuberculosis. In the presence of high clinical suspicion, the absence of diagnostic confirmation should not delay initiation of therapy.
Background and aims

Tuberculosis (TB) is an important worldwide ongoing health issue. This report describes a 17-month-old child with MDR-TB who was cured after a 24-month therapy regimen.

Methods

Case: A seventeen-month-old child presented with recurrent pneumonia. Physical examination revealed cervical rubbery lymphadenopathy less than 2 cm and crepitations on auscultation of lung. Elispot and ppd tests were negative. Computed tomography (CT) scan of the chest showed hilar lymphadenopathies and parenchymal lesions suggesting pulmonary tuberculosis. We started anti-tuberculosis treatment. At The sixth of the treatment patient was admitted to our clinic with enlarged cervical rubbery lymphadenopathy. We realized that microbiological test of gastric aspirate culture specimens were positive for MDR-TB. Control CT showed residual peribronchial infiltrations and hilar calcific lymph nodes. Hearing evoluation, vision examination, thyroid function test were performed. Then treatment of AMK, MOKS, PAS, PTH and Z was started based on susceptibility results of M. tuberculosis isolate which was continued to breed in gastric aspirate culture. Gastric aspirate cultures for Mycobacterium tuberculosis was still positive after 3 months of treatment and the current treatment was continued. Therapy regimen was stopped after a 24-months. To date, over the course of a follow-up period of more than 3 years, the clinical and radiological findings of the patient improved significantly.
The clinical presentation of TB in children is often nonspecific and differs from the patterns seen in adults. MDR-TB in childhood is a problem because of the long duration of treatment and the absence of pediatric formulations for most of the drugs.
Background and aims

Tuberculosis (TB) is a leading cause of death worldwide affecting a third of the world's population.\textsuperscript{1,2} Nigeria has the highest African TB prevalence and Kano State in North-western Nigeria has the second highest TB prevalence.\textsuperscript{3} The global childhood TB burden and in Nigeria is unknown. I aimed to identify Paediatric TB care challenges in Kano perceived by Paediatric and Directly Observed TB Treatment [DOT] Centre health care providers.

Methods

The study was descriptive cross sectional involving structured questionnaire interviews of 43 health providers from 8 Major Secondary and 2 Private Health facilities.

Results

More than half of interviewed health staff were aged between 30 and 40 years and the majority were Community Health Extension Workers [39.5%]. Almost half of health workers interviewed had greater than 10 years' health work experience and greater than 36 months DOT care provision. Majority [90.7\%] of health workers perceived contact tracing logistics as challenging in identifying childhood TB and 69.8\% of health workers perceived poor paediatric TB knowledge as a challenge. Majority of health workers [90.7 – 97.7\%] perceived specified patient and community factors as challenges to Paediatric TB care access and good care outcomes.

Conclusions

Most health workers perceived contact tracing logistics and inadequate health worker Paediatric TB knowledge as challenges to Paediatric TB identification while patient and community factors challenge Paediatric TB care access.

ACKNOWLEDGEMENT

I am grateful for the Kano State and KNCV TB Control Programmes’ support and Dr Abubakar Gezawa and Dr Abdulazeez Imam for collecting and analysing the data, respectively.
Knowledge and Attitudes about Tuberculosis in High School Students, A Cross Sectional study In 5 Peruvian schools
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¹Pedro Ruiz Gallo University, Lambayeque, Chiclayo, Peru  
²Cayetano Heredia University, Lima, Lima, Peru

Background and aims

Tuberculosis (TB) incidence and resistant forms remain high despite government efforts in Peru and increasing development, this poses in risk to vulnerable groups such as teenagers. The objective of this study was to determine the level of knowledge and attitudes about tuberculosis that high school students have in a district of Peru Northwest coast (Chiclayo).

Methods

A cross-sectional-descriptive survey (self-administered) was performed. A knowledge score in the survey above or equal to 11 was considered adequate.

Results

The sample included 319 students selected by simple random sampling in 5 schools (3 urban and 2 rural) in a high burden area for tuberculosis. The average knowledge score was 8.39 out of 20 possible points as maximum. 18.8% of the students had adequate level of knowledge about TB. 51.41% showed positive attitudes towards patients with TB. Only 43.26% showed adequate knowledge in prevention. Lower values were obtained in treatment (19.12%). There was association between adequate knowledge and having more schooling years, urban origin, and positive attitudes towards tuberculosis (p<0.05). Women displayed more positive attitudes as well as students from urban areas.

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| MEAN² |
| RURAL | 14.05 |
| URBAN | 16.08 |

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<td>NO</td>
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Conclusions

The level of knowledge about tuberculosis in the high school children is not adequate. Some factors related to better knowledge could be studied more and enhanced.
TUBERCULOSIS IN CONGOLESE CHILDREN INFECTED WITH HIV AFFECTED BY SEVERE ACUTE MALNUTRITION AT THE GECAMINES HOSPITAL IN DIOLO-DRC

J.P.A. Ilunga Mulaja¹
¹ONG Equilibre International, SANTE PUBLIQUE, Kananga, Democratic Republic of the Congo

OBJECTIVE:
To describe the incidence and diagnostic challenges of tuberculosis in children infected with the Severe Acute Malnutrition (SAM) humanimmunodeficiency virus (HIV).

DESIGN:
Post-hoc analysis of a random controlled trial that included naïve, HIV-infected and antiretroviral-treated children. Test records and hospital laboratory results were explored for clinical diagnosis and bacteriologically confirmed cases of tuberculosis. Negative binomial regression was used to investigate associations with confirmed TB cases, excluding cases where clinical diagnosis was not confirmed by microbiological confirmation.

RESULTS:
Of 82 children enrolled in the case study, 21 (25.6%) were diagnosed with TB, with bacteriological confirmation in 8 cases. Sputum sampling (as opposed to gastric lavage) was associated with an increased risk of subsequent diagnosis of TB (adjusted relative risk [aRR] 1.134, 95% CI 1.02-1.26). The culture-proven bacterial infection during admission was associated with reduced risk of tuberculosis (aRR 0.856, 95% CI: 0.748-0.979), which may reflect false negative microbiological tests secondary to broadspectrumempiricalantibiotics.

CONCLUSION:
TB is common in HIV-infected children with SAM. Although microbiological confirmation of the diagnosis is feasible, empirical treatment remains common, possibly influenced by suboptimal tests and false-negative TB diagnostics. A rigorous microbiological survey on tuberculosis should be integrated into the programmatic management of HIV and SAM.
CHARACTERIZATION OF PLASMA PROTEINS IN CHILDREN OF DIFFERENT MYCOBACTERIUM TUBERCULOSIS INFECTION STATUS USING LABEL-FREE QUANTITATIVE PROTEOMICS

L. Jieqiong, S. Lin, X. Fang, S. Adong

1Beijing Children's Hospital- Capital Medical University, MOE Key Laboratory of Major Diseases in Children- National Key Discipline of Pediatrics Capital Medical University- National Clinical Research Center for Respiratory Diseases- Beijing Key Laboratory of Pediatric Respiratory Infection Diseases- Beijing Pediatric Research Institute, Beijing, China

Background and aims

Tuberculosis (TB), caused by Mycobacterium tuberculosis (MTB), is an infectious disease found worldwide. Children infected with MTB are more likely to progress to active TB (ATB) and the molecular mechanism behind this process has long been a mystery.

Methods

We employed the label-free quantitative proteomic technology to identify differences in plasma proteins between ATB and LTBI. Four of the proteins (XRCC4, PCF11, SEMA4A and ATP11A) were selected and further verified by qPCR and western blot.

Results

Based on the high throughput proteomics data, a total of 2170 proteins were identified. Among them, 521 proteins differed (> 1.5-fold or < 0.6-fold) in the LTBI group, and 318 proteins in the ATB group when compared with the control groups (inflammatory disease control and healthy control groups). Of these, 49 overlapping proteins were differentially expressed between LTBI and ATB. The MTB infection status was mainly related to differences in binding, cellular and metabolic processes. At the verification stage, the expression of XRCC4, PCF11 and SEMA4A mRNA presented an increased trend in ATB group compare with LTBI. At the protein level, the expression of all these proteins by western blot in ATB/LTBI was consistent with the trends from proteomic detection.

Conclusions

We identified 49 differentially expressed plasma proteins related to the differential status of MTB infection by the label-free quantitative method. After analyzing the protein functions and regulatory networks, XRCC4, PCF11, SEMA4A and ATP11A were further verified by qPCR and western blot. Our results will provide important data for molecular mechanism studies and biomarker selection during MTB infection.
BACKGROUND AND AIMS
Although the recently reported number of newly identified cases of tuberculosis has been slightly decreased in Korea, drug resistant tuberculosis is still challenging and its spreading to the contacts is a medical concern. We reviewed the 2 year follow-up results of household or close pediatric contacts of drug resistant tuberculosis cases.

METHODS
We reviewed medical records of a total of 155 children tested for a contact history with infectious tuberculosis at Chonbuk National University Children’s Hospital from January 2012 to December 2014. All contacts were managed in compliance with Korean Guidelines for Tuberculosis.

RESULTS
Among the children, 9 were contacts of cases with drug resistant tuberculosis: 6 were isoniazid-resistant and 3 were with isoniazid-and-rifampin-resistant. For the 2 contacts of isoniazid-resistant tuberculosis who showed positive tuberculin skin test result, 6 months of rifampin was prescribed. The rest 4 contacts of isoniazid-resistant tuberculosis cases and the 3 contacts of isoniazid-and-rifampin-resistant tuberculosis showed negative tuberculin skin test, and no anti-tuberculosis medication was prescribed for them. All of 9 contacts of cases with drug resistant tuberculosis were regularly followed up for at least 2 years and they developed no tuberculosis disease during the follow-up period.

CONCLUSIONS
The spreading of drug resistant tuberculosis to contacts is problematic, especially to pediatric contacts. To reduce the incidence and the prevalence of childhood drug resistant tuberculosis, a long term regular follow-up of those contacts is needed.
Background and aims

Tuberculosis is an important cause of morbidity and mortality worldwide. In 2015, 1.4 million people died due to TB. Drug resistance has been responsible for obstructed successful control of TB.

The aim is to determine the prevalence of drug resistant pulmonary and extra-pulmonary tuberculosis in paediatric population

Methods

Pulmonary and extra-pulmonary samples from children under the age of 12 years with suspected tuberculosis received over a period of 15 months were cultured using liquid culture (MGIT960) or run in the Xpert MTB/RIF assay for the diagnosis. The drug resistance to first line drugs in culture positive cases was detected using Line Probe Assay and Conventional DST using MGIT 960.

Results

Overall 1395 samples were received for liquid culture, out of which 118 (8.5%; 108 EPTB and 10 PTB) were positive for M.tuberculosis complex. 480 samples were received for Mycobacterium tuberculosis detection by Xpert MTB/RIF Assay.

MDR detected by DST and LPA was 5.9 %. Isoniazid monoresistance detected by DST and LPA was 7.6%. Ethambutol monoresistance was 15.6%. Streptomycin resistance was 14.1 %. Rifampicin monoresistance detected by GeneXpert, used as a marker for MDR was 19.8%

Conclusions

The results of our study show that although Xpert MTB/Rif Assay is helpful for rapid diagnosis of TB, we cannot rely solely on Xpert MTB/RIF assay to determine drug resistant TB as it can miss out the isoniazid monoresistance and ethambutol and streptomycin monoresistance as determined in our study. Hence, DST should also be done along with Xpert MTB/RIF assay to prevent the underestimating the burden of drug-resistant tuberculosis.
CHILDHOOD TUBERCULOSIS IN SUB-SAHARAN AFRICA
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Background and aims

Tuberculosis remains a public health concern of concern in Burkina Faso and sub-Saharan Africa. The aim of this study was to describe epidemiological, clinical and paraclinical aspects of childhood tuberculosis in sub-saharan setting.

Methods

It was a cross-sectional study of new cases of tuberculosis diagnosed between 1 January 2016 and 31 December 2016 in the pediatric department of the Bobo-Dioulasso University Hospital (Burkina Faso).

Results

Twenty eight (28) children where included; the mean age was 8.3 years. The major part of patients (60.7%) came from socio-economic disadvantaged environments. CGB vaccination coverage was 92.9%; A contagion history was found in 42.9% of cases. Malnutrition was present in 82.1% and the combination HIV/tuberculosis was 17.8%. Pulmonary tuberculosis (fig 3) was the most frequent clinical form (50%). Sputum was positive in 2 children. Nodes location (35.7%) was the main extrapulmonary form (fig 2).
Figure 3: Radiographie thoracique de face chez une adolescente de 15 ans qui a été hospitalisée pour une toux chronique avec une fièvre, chez qui nous visualisons un syndrome interstitiel marqué par : une vaste cavité de la lingula (étoile) avec une bronche de drainage (double flèches), un infiltrat apicodorsal droit (flèche) et un aspect de milière basal gauche (tête de flèche).
Conclusions

Pulmonary tuberculosis in children is not uncommon in sub-saharan Africa. The national policy of free treatment of cases is to be welcomed, but a strengthening of the diagnostic capacities should allow an optimal management of the infection in pediatric environment.
Drug resistant tuberculosis (TB) is a severe threat for children’s health, and its therapeutic schedule is different from drug sensitive tuberculosis by WHO recommendations. To early diagnose drug resistant TB, this study analyzed the clinical features of patients and the concordance of the phenotype and genotypic drug sensitive test (DST).
Background

In 2010, the WHO recommended the use of Xpert MTB/Rif for the simultaneous detection of tuberculosis (TB) and rifampicin resistance directly from sputum specimens. Young children cannot expectorate; hence sputum specimens are not always available. We assessed urine as a possible specimen source to diagnose TB in children.

Objective

To explore the use of urine Xpert MTB/Rif for the diagnosis of childhood pulmonary tuberculosis.

Methods

During a field study to enhance childhood TB identification, spot urine samples were collected from ambulatory children aged 0 to 14 years with presumptive pulmonary TB. Samples were stored at 2 to 8°C for a maximum of 72 hours or at -20°C for a maximum of 5 days, before testing. Xpert MTB/RIF was performed by blinded technicians in 169 samples using 1 ml of unprocessed urine according to the manufacturer’s recommended procedure for sputum samples but the sample reagent was mixed at a 1:3 sample to reagent ratio. Urine was concentrated for testing in 44 samples.

Results

From 17 February 2016 to 08 June 2017, we collected urine from 169 presumptive TB cases. The mean age of presumptive TB cases was 5.8 years (median 5.2, range 0.5 to 14.2) with more males (105, 62%) compared to females. All urine samples tested negative for Xpert MTB/RIF, regardless of whether concentration was performed or not. Out of these 169 presumptive TB cases, 44 (26%) were clinically diagnosed and 5 (3%) were bacteriologically diagnosed to have TB disease using either sputum or nasopharyngeal aspirate specimens.

Conclusions

In this community-based study, urine Xpert MTB/RIF does not appear to contribute to the diagnosis of childhood TB.
PROLONGED FEVER AND LETHARGY: A DIAGNOSIS TO REMEMBER

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Background and aims

Tuberculosis in children progresses rapidly and may present as severe disease such as miliary tuberculosis or meningitis, which represents 1 to 2% of all cases in immunocompetent individuals.

Methods

Case-report.

Results

Previously healthy 18-months-old girl born in Portugal who presented with low grade fever and anorexia evolving over 4 months. She had not received BCG vaccination and there was no history of cough or weight loss. She had ill appearance, irritability, uncoordinated movements, without meningismus. Blood analysis showed anemia, low grade leucocytosis, abnormal liver enzymes and CRP 3 mg/dL. The first-tier investigation of infectious diseases was negative and chest X-ray showed diffuse micronodular infiltrate. Her general condition progressively worsened, with lethargy and higher fever. Ophthalmologic exam found choroidal tubercles. Cranial MRI showed multiple millimetric tuberculomas affecting the cerebral cortex, brainstem, cerebellum, meninges and areas with edema and vasculitis. CSF cytochemical analysis was compatible with tuberculous meningitis. Thoraco-abdominal CT showed reticulonodular infiltrate of the lungs, miliary nodules in both kidneys and mediastinum, mediastinal mass, disseminated adenopathies and hepatomegaly. The diagnosis was made by isolation of the Mycobacterium tuberculosis in gastric aspirate. The patient evolved with tachycardia and hypertension, which were controlled with antihypertensive therapy. The echocardiogram was normal. She initiated four-drug antituberculous and corticosteroid regimen with favorable evolution.

Conclusions

It is important for clinicians to consider tuberculosis when evaluating children with prolonged fever. Diagnosis of miliary tuberculosis is a challenge and if untreated has a fatal outcome. High index of clinical suspicion, early diagnosis and timely institution of anti-tuberculosis treatment can be lifesaving.
ASSOCIATION STUDY BETWEEN POLYMORPHISMS OF THE XANTHINE DEHYDROGENASE/OXIDASE (XO) GENE AND ANTI-TUBERCULOSIS DRUG-INDUCED HEPATOTOXICITY (ATDH) IN CHINESE HAN CHILDREN

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Background and aims

Reactive oxygen species (ROS) induced by anti-tuberculosis drugs can lead to mitochondrial dysfunction and lipid peroxidation, resulting in adenosine triphosphate depletion, mitochondrial permeability transition, and even hepatocyte apoptosis or necrosis. Xanthine dehydrogenase/oxidase (XO) is known to be a major source of intracellular ROS via oxidation of hypoxanthine and xanthine. To investigate whether single-nucleotide polymorphisms (SNPs) of XO are associated with susceptibility to anti-tuberculosis drug-induced hepatotoxicity (ATDH), we have performed this case-control study including 41 ATDH cases and 116 ATDH-free controls in Chinese Han children.

Methods

The tagSNPs of XO were selected based on their ability to tag surrounding variants (chr2: 31557188-31637611) in the CHB database of HapMap. Eleven SNPs (rs10190201, rs1042039, rs1366817, rs1429372, rs169596, rs17038412, rs1864280, rs206860, rs2236168, rs3769618, and rs761926) were chosen for genotyping by using a MassARRAY system. SHEsis program were used for the statistical analysis.

Results

In above SNPs, nominal difference was only found in allele (\(P = 0.018, \text{OR} = 1.89, 95\%\text{CI} = 1.12-3.20\)) and genotype distributions (AA vs. GG, \(P = 0.014, \text{OR} =3.92, 95\%\text{CI} = 1.32-11.60\)) of rs3769618 between the case and control groups. However, no significant difference was observed in allele and genotype distributions of the SNPs of the XO gene between the two groups after Bonferroni correction.

Conclusions

TagSNPs of the XO genes aren’t associated with ATDH in Chinese Han children. As our samples are limited, we will amplify our samples for association studies between other genes participated in oxidative stress and ATDH.
A RETROSPECTIVE COMPARATIVE ANALYSIS BETWEEN CHILDREN WITH TUBERCULOUS MENINGITIS AND BACTERIAL MENINGITIS IN HETIAN, CHINA

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Objectives
Our major goal was to identify some common features and differences that could help improve our ability to diagnose very early tuberculous meningitis (TBM) and to prevent the development of neurological complications in rural areas of developing countries.

Methods
We performed a retrospective analysis of 48 pediatric cases diagnosed with TBM and 23 cases with bacterial meningitis in the pediatric department of Hetian District People’s Hospital of China during 2013-2015. The age, gender, residence, family income, parents’ level of education, family history of tuberculosis, status of BCG vaccination, and clinical, laboratory and radiological features were compared.

Results
The diagnosis for TBM is done according to the criteria of Medical Research Council and The Textbook of Nelson Pediatrics. Among all the variables, wasting, development retardation, parents’ education lower than primary, fever lasting more than 1 week, convulsion more than three episodes, omit and asymmetry of the pupils were strongly correlated with the patients of TBM. Less than 1-year old may be a risk factor for TBM.

Conclusion
Our study showed a strong correlation between wasting, development retardation, parents’ education lower than primary, fever lasting more than 1 week, convulsion more than 3 episodes, omit and asymmetry of the pupils to pediatric TBM. These results may help doctors in rural areas to diagnosis TBM in early stage.
Background and aims

There are no clear guidelines regarding duration of therapy in case of persistent tuberculomas.

Methods

We present a series of six cases of children with CNS TB who received ATT for a period varying between 23 months to 32 months depending on the resolution of lesion seen in neuroradiological scans of the patients.

Results

Decrease in number and size of granuloma were noted in all patients while one patient showed complete resolution. After stopping ATT, the size of the granuloma remained the same while in one patient an increase was noted. (table 1)
Table 2: Clinical presentations of all children

<table>
<thead>
<tr>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
<th>Case 5</th>
<th>Case 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>12 years</td>
<td>10 years</td>
<td>7.5 years</td>
<td>4 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Type of TB</td>
<td>Pre-DR</td>
<td>Pre-DR</td>
<td>Suspected DR</td>
<td>Suspected DR</td>
<td>Suspected DR</td>
</tr>
<tr>
<td>Presentation</td>
<td>Convolusions</td>
<td>Convolusions</td>
<td>Increasing size of tuberculosis</td>
<td>Increasing size of right lower limb</td>
<td>Convolusions</td>
</tr>
<tr>
<td>Lesions</td>
<td>Diabetes mellitus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Treatment schedule</td>
<td>Capreomycin, PAS, Cys, CTZ, cot</td>
<td>ZNZE + HR</td>
<td>ZNZE for 1 year and first line ATT for 1½, HRZE then Mtx, PZA, Cys, 1st AM, 2nd AM, cot, Am (1 month), 3rd PZA, Cys, no lesion seen of lesion</td>
<td>HRZE</td>
<td>HRZE</td>
</tr>
<tr>
<td>Outcome</td>
<td>Decrease in size of granuloma</td>
<td>Decrease in size of granuloma</td>
<td>Decrease in size of granuloma</td>
<td>Decrease in size of granuloma</td>
<td>Decrease in size of granuloma</td>
</tr>
<tr>
<td>Follow-up after treatment completion</td>
<td>1 year (granulomas)</td>
<td>1 year (granulomas)</td>
<td>3 years (granulomas, decreased but persistent)</td>
<td>Patient asymptomatic</td>
<td>Patient asymptomatic</td>
</tr>
</tbody>
</table>


**Conclusion:** Thus duration of ATT in patients with tuberculoma may vary and may be required for longer time based on treatment response.
Background and aims

To determine the sensitivity & specificity of tuberculin skin test (TST) in BCG vaccinated children for diagnosis of tuberculosis (TB).

Methods

This observational study was conducted at a single tertiary care centre over a period of 32 months from March 2012 to November 2014. All children up to 15 years of age who had received BCG at birth, suspected of TB and referred to pediatric TB clinic were enrolled in the study. All patients were given TST by 5 TU PPD-S. Diagnosis of TB was based on either clinical, histopathological or bacteriological grounds.

Results

Out of 371 patients, 341(91.91%) had TB. TST was positive in 227(61.2%) and negative in 144(38.8%) patients. Sensitivity of TST to detect active TB was 62.8% and specificity was 56.7%. TST cut-off as ≥15mm increased specificity of TST to 73.3% but sensitivity decreased to 25.8%. Age, gender and contact with TB patients did not affect TST results. Factors associated with TST results are depicted in Table 1.
Conclusions
Accuracy of TST for the diagnosis of TB is low with low sensitivity and specificity. By increasing the cut-off for positive TST to >15mm, number of false positive TST can be reduced.
PREVALENCE OF PAEDIATRIC DRUG-RESISTANT TUBERCULOSIS IN MUMBAI, INDIA AND ITS OUTCOME

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Background and aims

To determine prevalence of drug-resistant (DR) tuberculosis (TB), patterns of resistance and outcome in children in Mumbai, India.

Methods

This retrospective study was done in 1145 pediatric patients referred between July 2013-September 2016. Children were defined as having DR-TB on the basis of GenXpert or Line Probe Assay (LPA) and/or drug susceptibility testing (DST) of Mycobacterium tuberculosis (MTB) grown on culture or from DST of the contacts. Patterns were compared with pre-2013 data which was previously published.

Results

Prevalence of DR-TB was 110 (9.6%) which showed an increase as compared to 5.6% in pre-2010 period and 7% in 2010-2013 (p=0.01). Twenty-two (20%) children had pulmonary TB (PTB) and 88 (80%) had extra-pulmonary TB (EPTB). 89 (87.2%) samples grew MTB on culture. GenXpert was done in 71 patients, of which MTB was detected in 44 (62%) patients and it showed rifampicin-resistance (RR) in 39 (88.6%). Ten (9.09%) cases were monoresistant, 6 (5.45%) patients had polyresistant disease, 29 (26.36%) had multidrug-resistant (MDR) TB, 32 (29.09%) patients had pre-extensively drug resistant (pre-XDR) TB and 7 (6.36%) children had XDR-TB. Ethionamide resistance increased from 26.1% pre 2013 to 60.8% post 2013 (p=0.01) and ofloxacin resistance rose from 30.4% pre-2010, to 47.6% in 2010-2013 and 56.9% post 2013 (p=0.08). Moxifloxacin resistance showed an acute rise from 8.7% pre-2010, to 46% in 2010-2013 and 57% post 2013 (p=0.0002). Thirty three (30%) patients had completed their treatment, 21 (19.09%) were lost to follow up and 56 (50.09%) patients are still on treatment.

Conclusions

Pediatric DR-TB is increasing in Mumbai with most patients having pre-XDR TB and quinolone and ethionamide resistance in addition to MDR strains.
IFITM3 PARTICIPATE IN HOST DEFENSE AGAINST TUBERCULOSIS IN PHAGOCYTOSIS PATHWAY

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Background and aims

Interferon-induced transmembrane protein 3 (IFITM3) has been suggested to be associated with susceptibility of pediatric tuberculosis (TB), an infectious disease initially caused by survival of mycobacterium tuberculosis (M. tuberculosis) within alveolar macrophages and epithelial cells. As IFITM3 is a transmembrane protein and an important downstream factor of interferon (IFN) and Toll like receptors (TLRs), we want to know whether IFITM3 could help eliminating mycobacteria in the phagocytosis pathway.

Methods

IFITM3 was subcloned into eukaryotic fluorescent expression vectors. Confocal microscopy was used for determining subcellular localizations of IFITM3 with early endosome, late endosome/lysosome by coexpressing with organelle specific proteins and/or staining with late lysosome tracker in type II alveolar epithelial cells. Distributions of IFITM3 during the infection of TB vaccine strain mycobacterium bovis bacille calmette-Guerin vaccine (M. bovis BCG) were also illustrated in this study.

Results

We noticed that overexpressing IFITM3 increased the size and number of acid organelle (late endosome/lysosome), and reduced the survival of intracellular M. bovis BCG. IFITM3 protein locates mainly on organelle membranes of late endosome/lysosome. Besides, it also exists on cell membranes. IFITM3 does not accumulate at the phagocytosis site of M. bovis BCG on cell membrane, but could be transported to the membrane of M. bovis BCG phagosome after fusing of IFITM3 positive vesicles with phagosomes, and colocalization of IFITM3 with M. bovis BCG phagosome increased the digestion of the swallowed bacillus in type II alveolar epithelial cells.

Conclusions

IFITM3 could participate in host defense against TB in the phagocytosis pathway.
Background and aims

The aim of this study was to analyze retrospectively the clinical findings, radiology, microbiology, and laboratory test results and treatment characteristics of pediatric tuberculosis patients followed at our clinic between 2008-2013.

Methods

A total of 236 children (mean age 94.39±58.73 months) were included in this study. Tuberculosis or latent tuberculosis diagnosis was made via tuberculin skin test (TST), interferon-gamma release assay (IGRA), chest X-ray, thorax CT, sputum cultures for acid-fast bacilli (AFB) and culture sensitivity tests.

Results

34 (44.7%) pulmonary TB, 26 (33.8%) extrapulmonary TB and 16 (21.5%) both pulmonary and extrapulmonary TB diagnosis were made of 76 (43 male) TB cases. Chest X-ray and thorax CT analyses showed 30% and 64% lymphadenopathies respectively. Most prevalent extrapulmonary involvement was lymph node TB in 12 cases. History of contact with a TB patient was detected in 24 cases. 21% AFB, 34% culture positivity was detected in patients whom microbiological specimens were collected. Drug resistance was detected in 6 cases. Treatment of TB patients was successful, however 11.8% developed sequelae. Positive family screening results were obtained in 20% of 160 patients diagnosed as latent TB. 91.9% were positive on TST and 19.4% on IGRA test.

Conclusions

History of contact with TB patient was more prevalent in active TB patients compared to latent TB patients. History of contact with a TB patient and medical screenings are with utmost importance in TB control. Microbiological diagnosis rate was found to be low which was similar with global rates and the drug resistance data of childhood TB was limited.
A CASE OF TUBERCULOUS PERITONITIS DIAGNOSED BY WAY OF LAPAROSCOPY
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²Istanbul University - Istanbul Medical Faculty, Pediatric Surgery, Istanbul, Turkey
³Istanbul University - Istanbul Medical Faculty, Pediatric Radiology, Istanbul, Turkey

Background and aims
Tuberculous peritonitis (TBP) is a rare form of extrapulmonary tuberculosis. The diagnosis of TBP is particularly challenging in children. Herein, we present a child who had been admitted with ascites and was diagnosed as TBP by way of laparoscopy.

Methods
A previously healthy 3-year-old girl presented with newly onset fever and abdominal pain. She had abdominal distention and generalized tenderness with palpation.

Results
Abdominal percussion revealed dullness on nonspesific locations. Abdominal ultrasonography showed diffuse ascites with multiple septations. Paracenthesis material was exudative and included plenty of polymorphonuclear leukocytes. She was started on antibiotherapy. Lymphocytic pleocytosis persisted on control peritoneal lavage sample. Acid resistant stain, tuberculous polymerase chain reaction test ant tuberculosis cultures were negative. Cytopathologic examination was normal. Diagnostic laparoscopy was compatible with TBP. Adenosine deaminase (ADA) level in peritoneal fluid was high. She was started on antituberculous treatment including isoniazid (INH), rifampicin (RIF), pyrazinamide and ethambutol. On 2nd month of antituberculous therapy, abdominal diameter showed obvious regression. She continued on INH-RIF therapy and is still being followed-up in our outpatient clinic.

Conclusions
Explorative laparoscopy and peritoneal fluid ADA level are very helpful in the diagnosis of TBP.
PULMONARY TUBERCULOSIS CASE PRESENTED WITH NECROTIZING PNEUMONIA
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Background and aims

Pulmonary tuberculosis is usually presented as mediastinal lymphadenopathy in childhood. Necrotizing pneumonia secondary to aspiration and polymicrobial agents is rare.

Methods

Herein we present a child tuberculosis case presented with necrotizing pneumonia.

Results

Case report: A previously healthy 14-year old gir presented with right lower pain and fever persisted for two weeks. She had lost 3 kilograms in the last month and fever of 38 °C. Respiratory sounds were diminished at right lower pulmonary zone and percussion revealed dullness. Acute phase reactants were elevated. Computerized chest tomography showed prominent necrosis and a cavitary lesion 3x4 cm in diameter on right middle lobe together with right pleural fluid. Pleural fluid sample was exudative. New infiltrative lesions occured on left lower pulmonary zones under ampicillin-sulbactam therapy. Her antibiotics were tapered to teicoplanin-ceftriaxone and then linezolid-meropenem and fluconazole in time. Tuberculin skin test was 18mm, interferon gamma releasing assay, tuberculous polymerase chain reaction test performed in pleural tissue sample and fasting gastric lavage fluid acid resistant stain were positive. She was started on antituberculous therapy. Despite broad spectrum antibiotic use, her fever persisted. Nasopharyngeal aspirate sample revealed bocavirus positivity and sputum culture revealed Candida albicans growth. Fluconazole was tapered to liposomal amphotericin B. Her general condition approved in time and she was discharged from the hospital on 28th day. She continued to have antituberculous therapy.

Conclusions

Necrotizing pneumonia secondary to aspiration and polymicrobial agents can be observed as pulmonary complications of tuberculosis.
Background and aims

Congenital tuberculosis is a very rare form of tuberculosis.

Methods

Herein, we present a case of congenital tuberculosis in an infant of HIV positive mother.

Results

Case report: A 35-day old boy was admitted with respiratory distress and fever. He was born vaginally at 36th gestational week from a mother diagnosed with HIV, HCV and miliary tuberculosis. He had been started on zidovudine prophylaxis soon after birth and breastfeeding had also been ceased. On attendance, he was icteric and had hepatosplenomegaly. Laboratory examinations revealed anemia, thrombocytopenia, elevated transaminases and direct hyperbilirubinemia. Multiple hypoechoic nodular lesions were observed in abdominal ultrasonography. Computerized chest tomography showed granulomatous lesion and multiple subcentimetric nodular lesions compatible with miliary tuberculosis. He was started on antituberculous therapy including isoniazid, rifampicin, pyrazinamide and streptomycin. Bone marrow aspiration performed for bicytopenia was normal. Fasting gastric lavage aspirate, bone marrow aspiration material and urine sample acid resistant bacilli stain were negative and the cultures were found to be sterile. HIV RNA and HCV RNA polymerase chain reaction tests were negative. Thrombocytopenia resolved after the cessation of zidovudine. Antituberculous therapy was continued as isoniazid and rifampicin after two months of induction therapy, for a total period of 12 months. Liver transaminases and bilirubin levels dropped within normal limits.

Conclusions

Congenital tuberculosis is a very rare disease with increased incidence of mortality. Children who are unresponsive to proper antimicrobial therapy should be searched for possible tuberculosis.
Identified the Characteristic of M.tb-specific CD4+ T and CD8+ T Cells Responses Induced in PBMCs of Active Tuberculosis Patients

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Background and aims

To evaluated the characteristic of cytokines of multifunctional CD4+ and CD8+ T cells induced by M.tb-specific antigen.

Methods

Total of 13 active tuberculosis patients with positive ELISpot, 11 pulmonary infection/tumor disease patients and 14 healthy controls with negative ELISpot were enrolled. Qualitative analysis of M.tb-specific CD4+ Th1 and CD8+ Tc cells responses (including IFN-γ, TNF-α and IL-2) by polychromatic flow cytometry after stimulation with the specificity of Mycobacterium tuberculosis antigen (ESAT-6 and CFP-10).

Results

Compared with the pulmonary infection/tumor disease group and the healthy control group: (1) the active tuberculosis group had a lower proportion of CD4+ Th1 cells secreted TNF-α, a higher proportion of CD4+ Th1 cells secreted IFN-γ or IFN-γ, TNF-α and IL-2 together; (2) CD8+ Tc cells secreted IFN-γ, TNF-α and IL-2 coincidently was higher in the active tuberculosis group.

Conclusions

Our results indicated that Multifunctional CD4+ Th1 and CD8+ Tc cells expressed IFN-γ, TNF-α and IL-2 concurrently may be associated with clinical reference value in active tuberculosis patients.
ATTENTION TO PEDIATRIC TUBERCULOSIS, DATA FROM BEIJING CHILDREN’S HOSPITAL: 2002–2010
X.R. Wu, B.P. Xu, Q.Q. Yin, L. Sun, W.W. Jiao, A. Shen

1Capital Medical University, Beijing Children’s Hospital, Beijing, China

Background and aims

Our aim was to describe the patient characteristics, clinical epidemiological profile, and treatment outcome of childhood tuberculosis (TB).

Methods

A retrospective, descriptive study was undertaken of 1212 children aged 0 to 18 years admitted to Beijing Children’s Hospital for the treatment of TB from January 2002 to December 2010. Statistical significance of category variables was evaluated by using Fisher’s exact test.

Results

Fifty-four percent of patients had extrapulmonary tuberculosis (EPTB), 38.8% had tuberculous meningitis, and 31.3% had disseminated TB. The last 2 types were defined as severe TB. Most patients with TB (81.6%) were cured or completed treatment. There were more patients aged <5 years and from rural areas with EPTB than with pulmonary tuberculosis. More severe cases of TB were found in patients aged <1 year than other less severe types of TB. Patients with no bacille Calmette-Guérin vaccination and a contact history at home had a significantly risk of contracting severe TB. Children aged <1 year and those with severe TB were more likely to have poor treatment outcomes (failed to improve or died). Among those with EPTB, only 61.3% and 61.1% had positive results on the purified protein derivative tuberculin skin test and chest radiograph, respectively.

Conclusions

In this referral hospital setting, more pediatric EPTB and severe TB patients were found among children aged <1 year. Age <1 year and having severe TB were risk factors for treatment failure. Thus, prevention and health care in pediatric TB should focus on both EPTB and severe TB.
Background and aims

To make clear the characteristics of Nontuberculous Mycobacteria (NTM) infection in children

Methods

All the mycobacteria strains isolated from 2013 to 2015 in Beijing Children’s Hospital were identified by the differential medium. Then the NTM strains were further identified by the molecular methods. The drug susceptibility tests were done by proportion method. And the clinical information of the patients was also analyzed.

Results

Total 143 mycobacteria strains were isolated during three years. There were 19 NTM strains (13.3%) after identification using PNB and TCH culture medium. It was found that Mycobacterium fortuitum was the most common (63.2%) by sequencing of hsp65. The total drug resistance rate of NTM strains was up to 100%. The resistance rate to isoniazid, rifampicin, streptomycin, ethambutol, ofloxacin, Kanamycin was 84.2%(16/19), 100%(19/19), 94.7%(18/19), 94.7%(18/19), 42.1%(8/19), 52.6%(10/19), respectively. The clinical manifestation of NTM infection in children is atypical, with symptoms of fever, cough, sputum, and chest radiological findings of patchy shadow and increased lung markings.

Conclusions

There is a considerable proportion of NTM in children with suspected mycobacterium infection, and drug resistance rate is high, but the clinical manifestations were lack of specificity. So we should pay more attention to the strain identification among children with suspected mycobacterium infection.
UTILITY OF NOVEL PLASMA METABOLIC MARKERS IN THE DIAGNOSIS OF PEDIATRIC TUBERCULOSIS: A CLASSIFICATION AND REGRESSION TREE ANALYSIS APPROACH

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Background and aims

Although tuberculosis (TB) has been the greatest killer due to a single infectious disease, pediatric TB is still hard to diagnose because of the lack of sensitive biomarkers. Metabolomics is increasingly being applied in infectious diseases. But little is known regarding metabolic biomarkers in children with TB. A combination of an NMR-based plasma metabolic method and classification and regression tree (CART) analysis was used to provide a broader range of applications in TB diagnosis in our study.

Methods

Plasma samples obtained from 28 active TB children and 37 non-TB controls (including 21 RTIs and 16 healthy children) were analyzed by an orthogonal partial least-squares discriminant analysis (OPLS-DA) model, and 17 metabolites were identified that can separate children with TB from non-TB controls. CART analysis was then used to choose 3 of the markers, L-valine, pyruvic acid, and betaine, with the least error.

Results

The sensitivity, specificity, and area under the curve (AUC) of the 3 metabolites is 85.7% (24/28, 95% CI, 66.4%, 95.3%), 94.6% (35/37, 95% CI, 80.5%, 99.1%), and 0.984 (95% CI, 0.917, 1.000), respectively. The 3 metabolites demonstrated sensitivity of 82.4% (14/17, 95% CI, 55.8%, 95.3%) and specificity of 83.9% (26/31, 95% CI, 65.5%, 93.9%), respectively, in 48 blinded subjects in an independent cohort.

Conclusions

Taken together, the novel plasma metabolites are potentially useful for diagnosis of pediatric TB and would provide insights into the disease mechanism.
ASSOCIATION BETWEEN POLYMORPHISMS OF THE ABCB1 AND ABCC2 GENES AND THE SUSCEPTIBILITY TO ANTI-TUBERCULOSIS DRUG-INDUCED HEPATOTOXICITY IN CHINESE HAN CHILDREN
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Background and aims

This study aims to investigate whether polymorphisms of the adenosine triphosphate binding cassette B1 (ABCB1) and ABCC2 genes are associated with susceptibility to ATDH in Chinese Han children.

Methods

A case-control study was performed in Chinese Han pediatric patients with tuberculosis. MassARRAY was used for genotyping in 16 tag single nucleotide polymorphisms (SNPs) of the ABCB1 and ABCC2 genes, and logistic regression was used to analyze differences of allele and genotype distributions of SNP polymorphisms between the case and control groups.

Results

A total of 41 incident ATDH cases and 189 ATDH-free controls were included in this study. No significant difference was found in the allele and genotype distributions of all SNPs in the ABCB1 and ABCC2 genes between the case and control groups ($P > 0.05$). And there was also no significant difference observed in the genotype distributions of all SNPs in the dominant and recessive heredity models ($P > 0.05$).

Conclusions

This study suggested that genetic variants of the ABCB1 and ABCC2 genes might not contribute to susceptibility to ATDH in Chinese Han children.
Positive Epistasis of Major Low-Cost Drug Resistance Mutations rpoB531-TTG and katG315-ACC Depends on Phylogenetic Background of Mycobacterium Tuberculosis Strain

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Background and aims

Here, we analyzed an impact of phylogenetic background and drug resistance mutations on transmission ability of multidrug resistant (MDR) Mycobacterium tuberculosis strains.

Methods

The study collection included all MDR strains of Beijing genotype isolated in the Beijing Chest Hospital, a largest tertiary TB facility in North China, in 2011-2013 (n=278). They were subjected to NTF/IS6110 and 24-loci MIRU-VNTR analysis. Drug resistance mutations were detected in rpoB, katG, inhA and oxyR-ahpC.

Results

Fifty-eight and 220 strains were assigned to the ancient and modern Beijing sublineages, respectively. The 24-VNTR clustering was higher in modern versus ancient Beijing strains (35.9% vs 12.1%; P=0.001). After adjustment for rpoB and katG mutations, the clustering decreased to 15.9% in modern and 0% in ancient sublineage. The most frequent combination of mutant alleles rpoB 531TTG and katG 315ACC was more prevalent in clustered vs non-clustered isolates in the modern sublineage (23/35 vs 47/185; P<0.0001).

Conclusions

The MDR population of the M. tuberculosis Beijing genotype in North China is dominated by strains of its modern sublineage. A combination of the known to be low fitness cost rpoB 531TTG and katG 315ACC mutations likely facilitates the increased transmission ability of the MDR strains of the modern but not ancient Beijing sublineage. Accordingly, positive epistasis of certain low cost, drug resistance conferring mutations appears to be modulated by the genetic background (phylogenetic sublineage) of a strain.
Background and aims

Recently, many studies have shown that clinical features and molecular characteristics of drug-resistant strains vary in different geographical areas, however, further information is needed to assess the dynamic evolution of drug-resistant TB. Comparative studies between different time periods are necessary to elucidate the development of drug-resistant TB.

Methods

A total of 255 and 537 strains were collected from Beijing Chest Hospital in 2006 and in 2012, respectively. Drug-resistance rates in two periods were compared.

Results

The overall rate of drug resistance among strains of TB in 2012 was 54.4%, significantly higher than that in 2006 (34.9%, \( P<0.001 \)). Rates of resistance to each first-line drug (isoniazid, rifampicin, streptomycin and ethambutol) and to second-line drug ofloxacin increased significantly from 2006 to 2012. The overall MDR rate also increased significantly from 2006 (14.9 %) to 2012 (27.0 %). The rate of MDR increased significantly between these two time periods in previously treated cases (\( P=0.023 \)) but not in new cases (\( P=0.073 \)). Previous treatment was found to be a risk factor for drug-resistant TB, especially for MDR-TB.

Conclusions

Our data suggests that the prevalence of drug resistant TB remains high in Beijing, China, and that increasing rates of resistance in \( M. \) tuberculosis to all anti-TB drugs should be considered when choosing an optimal anti-TB regimen. Moreover, acquired multi-drug resistance may play a primary role in the MDR-TB epidemic in Beijing, China. Consequently, this highlights the importance of an earlier start to effective and supervised treatment in order to reduce the burden of retreatment.
BACKGROUND AND AIDS

Endobronchial tuberculosis (EBTB) is the most frequent complication of primary pulmonary tuberculosis (PTB) in children. The aim of the study was to analyze characteristics and clinical role of bronchoscopy in diagnosis of childhood EBTB.

METHODS

A retrospective, descriptive study was undertaken in 157 children with EBTB undergone flexible bronchoscopy (FB) between January 2006 and June 2014.

RESULTS

The median age of the enrolled patients was 3.4 years, with 73.2% of patients under five years old. The most common subtype was tumorous type (145/157, 92.4%). If only involved bronchus were considered, the common affected sites were right middle lobe bronchus (49/228, 21.5%), left upper lobe bronchus (41/228, 18.0%), right upper lobe bronchus (41/228, 18.0%), right main bronchus (35/228, 15.4%), respectively. Children younger than five years old were at higher risk to have multiple endobronchial lesions (P=0.044), with an odds ratio of 2.313 (95% confidence interval: 1.009-5.299). Before the bronchoscopy, only 16 (10.2%) patients were highly suspected of EBTB, while the others were diagnosed as PTB without EBTB (69.4%), or misdiagnosed as pneumonia or foreign body aspiration (20.4%) on admission.

CONCLUSIONS

The patients under five years old are at high risk to progress to EBTB and have multiple endobronchial lesions. The most frequent subtype of EBTB in children is tumorous type. The lesions are seen in the right bronchial system more frequently. FB should be performed to detect the endobronchial lesions in suspected patients as soon as possible.
IDENTIFICATION OF DIFFERENTIALLY EXPRESSED TRANSCRIPTIONAL PROFILING FROM ACTIVE TUBERCULOSIS INFECTION TO HEALTHY CHILDREN

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Background and aims

To identify differentially expressed IncRNAs and mRNAs in PBMCs during the tuberculosis (TB) infection.

Methods

Genome-wide transcriptional profile of IncRNAs and mRNAs in PBMC cells from individuals with latent TB infection (LTBI), active TB, diseases control (infection disease except TB) and healthy controls were analyzed by microarray assay. mRNAs and IncRNAs were selected for validation using real time-quantitative polymerase chain reaction (RT-qPCR). Gene ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway based approaches were used to investigate biological functions and signaling pathways affected by the differentially expressed mRNAs.

Results

Fifteen differentially expressed mRNAs and thirty-three LncRNAs with top fold change were detected in TB vs. HCs. And GBP5 and NIFK genes remained the statistically significant difference between TB and the healthy control groups (GBP5: P < 0.005; NIFK: P <0.0001). Only one LncRNA didn’t show the statistically significant difference between TB and the healthy control groups after validation. Significantly enriched signaling pathways were mainly involved in cytokine-cytokine receptor interaction, Toll-like receptor signaling pathway and so no.

Conclusions

Our results identified two novel genes for distinguishing TB from healthy children.
ABNORMAL FINDINGS IN URINALYSIS FROM 270 CHILDREN WITH EXTRA-RENAL TUBERCULOSIS INFECTION: A EPIDEMIOLOGICAL INVESTIGATION FROM SINGLE CENTER

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Background and aims

To analyze retrospectively the urinalysis findings from the children with extra-renal tuberculosis infection, and evaluate the epidemiological characteristics of urinary abnormalities in children with extra-renal tuberculosis infection.

Methods

270 hospitalized children with extra-renal tuberculosis were selected from January to December of 2014 in the First Affiliated Hospital of Xinxiang Medical University. Detailed epidemiological investigation was performed in patients with extra-renal tuberculosis complicated with abnormal urine test.

Results

The detection rate of urinary abnormalities in 270 children with extra-renal tuberculosis was 21.1% (57/270). Urinary abnormalities involved simple proteinuria (27/57, 47.4%), simple hematuria (20/57, 35.1%), proteinuria and hematuria (10/57, 17.5%). The number of organs with tuberculosis involvement was related to the urinary abnormalities detection rate (c²=13.0, P<0.05). IgA level of 3/6 cases with urinary abnormalities were raised. 10 cases (17.5%) with tuberculosis infection were cured and urine test returned to normal. 36 cases (63.2%) were discharged due to symptomatic improvement. 5 cases were followed up and urine tests were normal. The others didn't carry out regularly urine test. 1 case (1.8%) with secondary lung tuberculosis and tuberculous meningitis died.

Conclusions

1. Tuberculosis is a common infectious disease in children, and the urine abnormalities, which are mostly concerning proteinuria, are also common in the children with extra-renal tuberculosis.
2. Urine abnormalities in extra-renal tuberculosis children is implicated in proteinuria or/and hematuria. Urine abnormalities may be related to the number of organs involved in tuberculosis.
Background and aims

Congenital tuberculosis is rare, even where tuberculosis (TB) is endemic. We report a case that highlights the importance of differential diagnoses of splenic and hepatic tuberculosis and linezolid for neonatal TB may facilitate treatment and the prognosis, but cannot be single used.

Methods

We reported a complicated case of congenital TB. A 13-day-old girl presented with a 6-day history of fever, originally. The infant abdominal ultrasound showed multiple nodes in liver and spleen. After 3 weeks of antibiotic therapy, including using linezolid in venous for 2 weeks, the nodes decreased but did not diminish. Then the linezolid was changed to orally-administered sequential therapy, but fever recurrence and neurological symptoms appeared after discharging for 1 week. Her mother was asymptomatic. But finally diagnosed with a TB infection by a positive T-SPOT. Congenital TB was strongly suspected because of the symptoms, signs and maternal TB history, and was confirmed by T-SPOT. Finally, review the literature of congenital TB.

Results

Timely administration of standard anti-TB therapy combined linezolid resulted in a good outcome of the patient.

Conclusions

Through this case, we aimed to emphasize the importance of including congenital tuberculosis in the differential diagnosis when a young infant admit with fever no reason and abdominal ultrasound show disseminated hepatic and Splenic nodal and linezolid can be useful in treatment of congenital tuberculosis. But it cannot be single used and its course is on controversy. Makes early recognition crucial and life-saving.
CLINICAL REPORT ON 48 CHILDREN UNDER 3 YEARS OLD WITH PULMONARY TUBERCULOSIS

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Background and aims

To improve the diagnosis of pulmonary tuberculosis in children under 3 years of age so as to reduce misdiagnosis and missed diagnosis.

Methods

The clinical and imaging data of 48 children under 3 years old who were diagnosed as tuberculosis from January 2010 to December 2015 in our hospital were analyzed retrospectively.

Results

The clinical manifestations were fever (n=39), cough (n=26), wheezing (n=6), seizures (n=3), cervical lymph nodes enlargement (n=1), headache (n=1), diarrhea (n=1), and abdominal distention (n=1). In 22 cases, exposure to tuberculosis patients, including mothers (n=9), fathers (n=7), grandfathers (n=2), uncles (n=2), grandmother (n=1), aunt (n=1) were recorded. Thirty-five children were vaccinated while 12 cases have not been vaccinated and one case unknown. Tuberculin purified protein derivative (PPD) test was done in 40 cases. The results were negative in one case, + in two cases, ++ in 15 cases, +++ in 12 cases. T-SPOT.TB was positive in 16 out of 26 cases.

Conclusions

In children under 3 years old, BCG vaccination, exposure to tuberculosis patients and PPD are essential clues of diagnosing tuberculosis. However, difficulty of obtaining sputum and gastric juice in children makes diagnosing tuberculosis difficult. Several diagnostic measures are needed to avoid misdiagnosis and missed diagnosis. In small children, manifestations of tuberculosis could be complicated and changeable. In children with enlarged chest lymph nodes, persistent pneumonia, pulmonary and lymph node calcification, tuberculosis should be suspected. Chest CT is far more superior to chest X-ray in identifying enlarged lymph nodes, necrotic foci, and bronchial changes.
A CASE REPORT OF CONGENITAL TUBERCULOSIS

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Background and aims

To improve clinicians on congenital tuberculosis awareness, reduce misdiagnosis and missed diagnosis.

Methods

A Retrospective analysis of 1 case of congenital tuberculosis in neonate with clinical manifestations, auxiliary examination, family relationship, treatment, outcome, the clinical diagnosis of the disease and treatment methods.

Results

In this case of child onset 33 days after birth with intermittent fever, abdominal distension, jaundice, hepatosplenomegaly, lymph nodes, chest CT, head MRI, kidney ultrasound positive, positive TB antibodies, lymph node biopsy found acid-fast bacilli; The mother have a clear history of tuberculosis; A well outcome after anti-tuberculosis treatment.

Conclusions

There is atypical manifestation of congenital tuberculosis, The course of disease is hidden, many complications, we should increase awareness of congenital tuberculosis, actively asked the history, as soon as possible to conduct a biopsy, for clear diagnosis. early treatment, improve the prognosis of children.
ANALYSIS OF THE TREATMENT EFFECT ON CHILDHOOD BRONCHIAL TUBERCULOSIS WITH THE COMBINATION INTERVENTIONAL TREATMENT

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Background and aims

Bronchial tuberculosis is involving the tracheal and bronchial mucosa and submucosa, and the muscular layer or cartilage may result in luminal stenosis and occlusion. Respiratory interventional therapy is very important. The purpose of this article is to evaluate the treatment effect on childhood bronchial tuberculosis with the combination interventional therapy.

Methods

38 cases bronchial tuberculosis patients, aged from 12 months to 18 years old, While receiving the anti-tuberculosis treatment, the bronchoscope interventional treatment were given. Children were randomly divided into conventional treatment group (A group) and combined treatment group (B group). The former was given airway cleaning by saline irrigation or biopsy forceps clips, spray isoniazid on mucosa; The latter was selective given Cryoablation, thermal ablation therapy, balloon dilatation, intramediastinal lymph nodes injection with TBNA needle, etc. in addition to the conventional treatment. Compared the number of treatment times and their lung function improvement. Children under the age of five compared the tPTEF/tE, the age of five or more children compared FEV1 (%)

Results

The interventional treatment times of the A group and B group were 7.3±3.4, 5.1±2.8 respectively, the difference was statistically significant (P < 0.05). The Lung function are similar between the two groups before treatment, no statistical significance (P > 0.05). After treatment, the tPTEF/tE of the A group and B group were 21±7, 27±8 respectively, FEV1 (%) were 65.2±8.5, 80.1±7.8 respectively, the difference were both statistically significant (P < 0.05).

Conclusions

The combination interventional treatment with the appropriate intervention means is beneficial to the recovery of childhood bronchial tuberculosis.
Background: Neonatal early-onset sepsis (EOS) is a significant source of morbidity and mortality among newborns, especially in very low birth weight infants. Most early-onset neonatal sepsis occurs in newborns who have negative screening cultures, which lead to a difficult therapy for these newborns.

Objective: What are the main pathogens of pregnant women and newborn especially for very low birth weight infants in our hospital? What kind of antibiotics should be the first choice?

Methods
We analyzed and compared the microbial cultures' data in obstetrics and neonatology including cervix secretion, rectal secretion, vaginal secretion, blood, urine, placenta’s culture in pregnant women and blood and sputum culture in new borns from 2013.1 to 2015.12 in our hospital.

Results
There is a little difference among pathogens every year, but the most common pathogens are Escherichia coli both in pregnant women and newborns. Candida albicans and Enterococcus faecium are also common in obstetrics, and Staphylococcus aureus and Klebsiella pneumonia are the second and third pathogens in newborns.

Conclusions
With strengthening awareness of test for intrauterine infection and changing the strategies of antibiotics in obstetrics, we have increased the ability of the prevention and treatment of intrauterine infection and diagnostic levels. We need to strengthen to cooperate with obstetrics and use antibiotics reasonably and standardized to improve newborns' outcomes.
STUDY OF EXPRESSION OF SCARB2 AND PSGL-1 OF EV71 RECEPTORS AND GENE CORRELATION WITH EV71 INFECTION
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Background and aims

To explore the expression of Scavenger receptor B2 receptor (SCARB2) and P-selectin glycoprotein ligand 1 (PSGL-1) of EV71 receptor in different tissue, and to explore SCARB2 and PSGL-1 gene differences affect on EV71 infection.

Methods

Mice were infected with EV71 by intraperitoneal injection, Westblot, fluorescence quantitative RT-PCR methods to detect the expression of SCARB2 and PSGL-1 in mice brain, cerebellum, and brain stem, spinal cord, heart, lungs. 186 cases of EV71 infection were collected, genomic DNA of children was extracted in peripheral blood leukocytes, PCR - RLFP and PCR-SSCP methods are applied to detect SCARB2 and PSGL-1 genotype and allele in children with EV71 infection (on mild cases, and sever cases were complicated by encephalitis in children with hand, foot and mouth disease). Record the patient's symptoms and signs, clinical features, laboratory test index.

Results

Within a certain period of time after infection, the expression of SCARB2 and PSGL-1 in the central nervous system increased significantly than in heart and lung, especially, in brainstem and brain. The 12-2-1091 G allele and genotype GG, exon 12-3-1819 T allele and genotype TT, exon 12-4-2106 G allele and genotype AA carriers in exon of SCARB2 tend to easy to suffer severe infection. 3-191 allele A and AA allele carriers in PSGL-1 exon tend to easy to suffer severe infection.

Conclusions

After EV71 infection, the expression quantity of SCARB2 and PSGL-1 increased significantly in the central nervous system. The gene polymorphism of SCARB2 and PSGL-1 on EV71 infection is close correlation with severity disease.
Background: Community nasal meningococcal carriage rates are high across Africa. Meningococcal infections are major causes of morbidity and mortality in the continent; especially among children and adolescents. This study aimed to determine nasal carriage prevalence and antibiotic susceptibilities of meningococcal isolates from healthy Ethiopian children and adolescents.

Method: A prospective cross-sectional study was conducted in Addis Ababa, capital of Ethiopia. Nasal swabs were collected and processed for identification, serotyping and antibiotic susceptibilities using standard techniques. Data on risk factors was collected using a questionnaire. Magnitude of association with carriage was assessed using bivariate and multivariate analysis and expressed in odds ratio and 95% confidence interval. Statistically significant differences were taken at p < 0.05.

Result: A total of 240 samples were screened (115 males and 125 females). Mean age of participants was 11.1 years. Crowded living conditions, extreme poverty and indoor cooking were frequently seen. Prevalence of nasal carriage for Neisseria meningitidis was 20.4% (49/240). Carriage was significant among children living under crowded conditions. Predominant serotypes were W135 - 20/49 isolates (40.8%) and C - 12/49 isolates (24.5%). Isolates were tested against Ceftriaxone, Ciprofloxacin and Penicillin. Isolates showed high resistance to Ceftriaxone (69.4%) and Penicillin (83.7% intermediate, 12.2% resistance). Meningococci were sensitive for Ciprofloxacin in 83.7% of cases. Multi-drug resistance was documented for 14.3% of isolates.

Conclusions: High meningococcal carriage was seen with higher rates observed among those living in crowded conditions. Predominant serotypes W135 and C and meningococci showed marked susceptibility to Ciprofloxacin and resistance to Ceftriaxone and Penicillin.
Increasing number of patients receive extracorporeal membrane oxygenation (ECMO) for life support. This study attempted to investigate the nosocomial infection in children with ECMO.

We performed this study retrospectively between April 2013 and January 2017 in our tertiary care university hospital. Medical records of 37 patients who received ECMO support for more than 72 hours were evaluated.

Totally 15 episodes of nosocomial infection identified in 11 of the 37 (29.7%) patients on ECMO including 6 (15%) cases of pneumonia, 5 (12.5%) bacteremia, 3 (7.5%) surgical site infections, and one (2.5%) cellulitis. The median age of patients was 10 months (minimum-maximum, 0-223 months), male and female rates were equal. The median duration of ECMO support was 15.5 days (minimum-maximum, 4-110 days). Indications for support included circulatory failure (82.5%) and non-cardiac (17.5%). The incidence of ECMO related nosocomial infection was 15 per 1000 ECMO-days. Six organisms isolated as the nosocomial infections contained: gram negative (n=1) and positive bacteremia (n=1), fungus (n=1) and polymicrobial bacteremia (n=3). Overall mortality rate was 62.5% however infectious related mortality rate was 22.5%.

The complication of nosocomial pneumonia rate of ECMO seems higher than the previous studies, but other nosocomial infections are low. This may possibly be attributed to the longer duration and the indications of ECMO for our patients. Despite the longer duration of ECMO, nosocomial infection episodes were not significantly higher than the literature.
MULTI-DISCIPLINARY APPROACH TO DESIGNING AND TESTING A NOVEL PEDIATRIC PULSE OXIMETER SENSOR FOR PEDIATRIC PNEUMONIA DIAGNOSIS IN LOW-INCOME SETTINGS
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Background and aims
The global medical device industry release a large number of new products every year. These devices are developed using field experience and expert advice, but due to financial constraints this expertise is generally restricted to a few clinicians from high-income settings and field trials are rare. We aimed to use a multi-disciplinary approach to rapid product design and testing, focused on pediatric pulse oximetry in low-income pediatric settings.

Methods
We set up a core working group, including: engineer, manufacturer, clinician, epidemiologist and front-line end-users from Britain, Malawi and Bangladesh. An expert reference group, including a range of experience in pediatric pulse oximetry was engaged for rapid feedback and accountability. We conducted field visits to varied clinical settings in Malawi at key decision points in the design process to facilitate direct interaction between developers and end-users.

Results
We engaged with 51 end-users from three countries, and a range of health-care settings, including community healthcare workers from Malawi and Bangladesh. Rapid feedback and direct field observation led to three design iterations, and a final prototype design achieved within 18 months.

Conclusions
We have successfully applied this rapid design approach to develop a pulse oximeter sensor that meets the need of low-resource pediatric settings better than available designs. Additionally, because the design will be made public, many manufacturers can bid to make it, potentially reducing the price significantly. For the engineers, this was an unprecedented opportunity to mesh a development process with the advice of dozens of experts and frequent field trials.
Fecal Microbiota Transplantation Used to Treat a Child with Severe Clostridium Difficile Infection

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Background and aims

Antibiotic administration is a convenient and efficient therapy for children with bacterial infection. However, children have pronounced intestinal permeability. After antibiotic treatment, children may suffer from antibiotic-associated diarrhea, even Clostridium difficile infection (CDI). Clostridium difficile bacteria is the main pathogen of pseudo-membranous enteritis, only a few antibiotics are sensitively such as metronidazole and vancomycin, and clinical relapse easily. In this report, the clinical effects of fecal microbiota transplantation (FMT) on children with antibiotic-associated CDI were explored.

Methods

A 3-year-old boy was enrolled for antibiotic-associated CDI and protein losing enteropathy. With colonoscopy, ulcerated colorectum was detected with yellow-white biofilm in the patient. Initially, traditional therapy with vancomycin and metronidazole was proposed, but the patient responded with severe hematochezia. Then FMT therapy was performed with the consent of the boy's parents and the approval of Institutional Review Board of Tongji Hospital.

Results

The patient's symptoms of CDI were visibly relieved after 5 continuous times of FMT. The blood and stool testing also indicated that the patient had recovered from CDI and lost protein enteropathy. One month after being discharged, the reexamination by colonoscopy suggested a good recovery of...
the colorectum, and no relapse or adverse events happened during the follow-up.

Conclusions

FMT improved the clinical symptoms of CDI effectively, and it might be a safe, short-course and promising therapy.
Fecal microbiota transplantation used to treat a child with severe clostridium difficile infection while antibacterial therapy showed no effect

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Background and aims

Antibiotic administration is an essential therapy for bacterial infection. Compared with adults, children are more likely to suffer from the side effects of antibiotics, such as antibiotic-associated-diarrhea (AAD), even pseudomembranous colonitis (PMC). *Clostridium difficile* (CD) is the main pathogen of PMC. However, only a few antibiotics, such as metronidazole and vancomycin may be effective to CD. In this report, a child with severe CDI was cured by fecal microbiota transplantation (FMT) while antibacterial therapy exacerbated the situation instead.

Methods

A 3-year-old boy was enrolled because of continuous AAD. PMC was detected by colonoscopy and CDI was diagnosed by CD culture and toxin identification. Initially, traditional therapy, such as probiotics and anti-CD therapy with vancomycin and metronidazole was proposed, but the patient responded with severe hematochezia. Then, FMT was performed with the consent of the boy’s parents and the approval of Institutional Review Board of Tongji Hospital.

Results

The patient’s symptoms of CDI relieved rapidly after FMT. The blood and stool testing also indicated that the patient recovered completely from CDI and loss of protein enteropathy after 4 times of FMT. One month after being discharged, the re-examination by colonoscopy showed a good recovery of the
colorectum, and no relapse or adverse events was observed during the follow-up.

Conclusions

FMT can improve the clinical symptoms of CDI effectively. It could be a safe, short-course and promising therapeutic method to pediatric CDI.
CEREBRAL VASCULOPATHY AFTER VARICELLA-ZOSTER INFECTION

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Background and aims

Varicella is a common and benign infectious disease however complications may occur. Vascular complications such as thrombosis and vasculitis are rare but potentially serious.

Methods

A 5-year-old boy presented with recurrent transitory (less than 12 hours) neurologic deficits – drooping of the right corner of the mouth, weakness of the right limbs and loss of the right hand’s fine motor skills, six weeks after VZV infection. The child had clear consciousness and no language deficits.

Results

Brain magnetic resonance imaging showed discrete irregularities in the M1 segment of the left middle cerebral artery suggestive of vasculitis without any parenchymal brain lesion. Transcranial doppler ultrasonography revealed stenosis (< 50%) of the same artery. In the EEG there was a focal, periodic and bitemporal slowing of the background activity, with left predominance. VZV-DNA was detected by polymerase chain reaction in the cerebrospinal fluid. The patient was given therapy with intravenous acyclovir (1500mg/m²/day) and metilprednisolone (30mg/Kg/day), followed by oral prednisolone (1mg/Kg/day, tapering down slowly), and oral acetylsalicylic acid (5mg/Kg/day), with clinical improvement. Reevaluation 3 and 6 months after discharge did not reveal any neurologic deficits.

Conclusions

VZV can invade the media layer of the cerebral arteries and trigger an inflammatory response, leading to vasculitis. Although it is a rare complication of varicella, this vasculopathy is a major cause of pediatric stroke. Clinical presentation as recurrent TIAs was reported previously and may warrant consideration of acute anticoagulation. This diagnosis must be considered when approaching a patient with acute neurologic deficits and a previous history of VZV infection.
Background and aims

We aimed to determine the causes, clinical features and outcome of encephalitis in Australian children.

Methods

We prospectively identified children aged 0 to ≤ 14 years with suspected encephalitis at five tertiary paediatric hospitals between May 2013 and December 2016 using the Paediatric Active Enhanced Disease Surveillance (PAEDS) network. A multidisciplinary expert panel reviewed cases and categorised them as encephalitis or not encephalitis using published definitions. Encephalitis cases were further categorised into the etiologic sub-groups: infectious, immune-mediated or unknown.

Results

To December, 2016, we identified 288 children with encephalitis (57% suspected cases): 58% had infectious causes, including 10% enterovirus, 10% parechovirus, 7% herpes simplex virus, 6% influenza, 6% M.pneumoniae and 8% bacterial meningo-encephalitis; 25% had immune mediated encephalitis, including 19% acute disseminated encephalo-myelitis (ADEM) and 5% anti-NMDAR encephalitis; 17% had unknown causes. 57% of cases were male. Infectious encephalitis occurred in younger children (median age 1.7 years, IQR 0.1-6.7) than immune-mediated encephalitis (8.3 years, IQR 5.0-12.4). Fifteen patients died (case fatality proportion 5%), 12 with infectious causes (2 influenza, 3 human herpes virus-6, 1 parechovirus, 4 bacterial); and 3 with unknown causes. 24% of
children showed moderate to severe neurological sequelae at discharge (Glasgow outcome scale score ≤4).

Conclusions

The causes of childhood encephalitis differ from those in adults. Epidemic viral infections predominate, especially in the very young. The most common specified causes were ADEM, enteroviruses and parechovirus; only one fifth of cases have unknown cause. Mortality is associated with an infectious cause; death or neurological morbidity occurs in a third of cases.
Background and aims

The aims of the study is to determine the etiology of urinary tract infections in children in the geographical area of Galați County, as well as to determine the resistance of isolated isolates to antibiotics so that this information comes to the clinicians' help for the initial treatment.

Methods

10802 urocultures were taken in patients aged 0-18 years admitted to the Children's Emergency Clinical Hospital in Galati during 1.01.2014-31.12.2016 with clinical symptoms of urinary tract infection. Of these, 891 urocultures were positive.

Results

Of the total urocultures performed, 8.24% were positive due to the presence of the following pathogens: enterobacteriaceae (Escherichia coli, Klebsiella spp., Proteus spp., Enterobacter spp., Citrobacter spp, Serattia spp), Enterococcus 0.99%, Staphylococcus spp. 0.57%, Pseudomonas 0.13% and other bacteria in insignificant percentages. Antiibiograms give us valuable data on the sensitivity of these germs to antibiotics compared to other geographic areas and previous years.

Conclusions

Enterobacteriaceae are most commonly encountered as a pathogen in the etiology of urinary tract infection in the pediatric population of Galati County. Laboratory investigations support the personalized treatment approach with the effective recovery of health.
BACKGROUND: Necrotising pneumonia (NP) is a severe complication of pneumonia, of which S.pneumoniae is the predominant pathogen, and P.aeruginosa is a rare. The study was to describe the clinical manifestations of P.aeruginosa NP in children.

METHODS: A retrospective study of NP cases was conducted in Shenzhen children's hospital from January 2009 to December 2016. P.aeruginosa NP was involved and the clinical presentation, laboratory data, hospital course and follow-up were described.

RESULTS: The pathogens were identified in 26 of a total of 41 NP cases, in which 9 was P.aeruginosa. Seven cases were community-acquired pneumonia. Eight cases were male. The median age was 0.75(0.52, 1.9) years. The course of fever (16.2±2.3 d) and hospital day (27.3±2.8 d) were long. The C-reactive protein (148.2±21.7 mg/L) and procalcitonin(120.7±85.5 pg/L) were elevated. Seven cases had pleural effusion and/or pneumothorax. Pleural drainage was performed in 6 cases and pleural decortication was performed in 1 case. Except one with uncontrollable infection was referred for partial lung resection, all the cases were cured with a mean course of (1.9±0.4) months for resolution of cavity. When compared with 13 cases of NP caused by S.pneumoniae and S.aureus in the same period, there were no different in clinical presentation, except the white blood cell counts were lower in P.aeruginosa NP.

CONCLUSIONS: P.aeruginosa as a pathogen is remarkable in NP in children of local district of China, which is hard to be differentiated from Gram-positive bacteria NP by the clinical manifestations. The first-line antibiotics for NP in children should cover P.aeruginosa.
NOSOCOMIAL INFECTIONS IN PEDIATRIC MALIGNANCIES FOLLOWING CHEMOTHERAPY

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Background and aims

Nosocomial infections are common among pediatric patients with malignancies following chemotherapy. Our aim is to explore the clinical features and assess the prevalence of nosocomial infection among those patients, and to analyze the risk factors and seek control strategies.

Methods

From the aggregated data between Jan 2016 and Dec 2016 in Hematology & Oncology Department in Shenzhen Children’s hospital, the clinical features of hospital-acquired infections were reviewed and analyzed in 268 pediatric patients with malignancies after chemotherapy. The infection-related factors and classification of the pathogens were also analyzed.

Results

There were 182 episodes of nosocomial infection in 103 patients, the prevalence of nosocomial infection was 38.43%, and per capita episode was 1.79. The hospital-acquired infections mostly occurred at the site of the respiratory tract (48.35%) and unknown site (14.84%). Clear pathogens were identified in 40 nosocomial infection episodes, in which G+ bacteria accounted for 10.44%, G+ bacteria 9.34%, fugus and virus both 1.1%. Long hospital stay (≥21d), white blood cell less than 2.0×10⁹/L, neutropenia and invasive procedures were isolated risk factors for nosocomial infection.

Conclusions

Pediatric patients with malignancies following chemotherapy are at high risk of hospital-acquired infection and the risk factors varies. Multiple measures according to those risk factors should be taken to prevent and treat nosocomial infections in order to decrease the morbidity and mortality.
ANTIBIOTIC SELECTION AND DRUG SENSITIVITY ANALYSIS OF CHOLANGITIS AFTER HEPATICO-PORTOENTEROSTOMY FOR BILIARY ATRESIA

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Objective: To explore the pathogenic bacteria and drug sensitivity of cholangitis in children who underwent hepatico-portoenterostomy for congenital biliary atresia, in order to provide the guide for appropriate treatment.

Methods: The clinical data included 300 cases of congenital biliary atresia Kasai postoperative cholangitis in our hospital between 2006 and 2016, according to its clinical types to analysis of the common pathogenic bacteria and antibiotics sensitivity.

Results: 1. There were 541 person times with the occurrence of cholangitis in 300 children, of which blood culture positive 128 person times. 2. The main pathogens of cholangitis after biliary atresia followed by escherichia coli, pseudomonas aeruginosa and enterococcus. Late cholangitis and frequent cholangitis should be alert to enterococcus infections. 3. The sensitivity rates of escherichia coli and pseudomonas aeruginosa to cefoperazone sulbactam were 75% and 78%, and to piperacillin tazobactam were 82% and 84%. The sensitivity rate to meropenem were 93% and 76%. The susceptibility of Enterococcus to vancomycin or linezolid was 100%.

Conclusion: Cefoperazone sulbactam and piperacillin tazobactam can be used as the first choice of antibiotics for biliary atresia Kasai postoperative cholangitis. Meropenem should be used to replace them when treatment effect was poor. Late cholangitis and frequent cholangitis should be alert to Enterococcus infections.
Background and aims

Intravenous immunoglobulin is recommended as initial treatment for Kawasaki disease, reducing prevalence of coronary artery lesions from 25% to 2-4%. But 10-15% patients, defined as intravenous immunoglobulin resistance, have persistence or reoccurrence of fever 48 hours after initial treatment. These patients have a significant increase in risk of developing coronary artery aneurysms. Accurately predicting the possibility of intravenous immunoglobulin resistance can reduce coronary artery lesions to some extent.

Methods

We reviewed 386 patients with Kawasaki disease hospitalized in the Department of Pediatrics of Peking University First Hospital from June 2007 to August 2016. 38 patients were resistant to intravenous immunoglobulin and 348 patients responded to it. We recorded laboratory test results and clinical baseline characteristics, analyzed difference between patients with different intravenous immunoglobulin responses, and studied the correlation between the baseline indices and the different intravenous immunoglobulin responses.

Results

In the group of immunoglobulin resistance, patients had significantly increased levels of peripheral blood white cell count, neutrophils count, C-reactive protein, plasma alanine aminotransferase, plasma aspartate aminotransferase and plasma prealbumin-to-albumin ratio \((p<0.05)\), but decreased levels of plasma albumin, sodium, chloride and albumin-to-globulin ratio \((p<0.05)\). Multivariate logistic regression analysis suggested that peripheral blood white cell count, plasma albumin and prealbumin-to-albumin ratio could be combined to predict the possibility of immunoglobulin resistance.

Conclusions

Increased peripheral blood white cell count, decreased plasma albumin and increased prealbumin-to-albumin ratio together could be utilized to predict the risk of immunoglobulin unresponsiveness in Kawasaki disease.
CLINICAL INFECTIOUS DISEASE

PREDICTION OF INTRAVENOUS IMMUNOGLOBULIN RESISTANCE IN PATIENTS YOUNGER THAN 1-YEAR-OLD WITH KAWASAKI DISEASE

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Background and aims

Kawasaki disease is an acute systemic vasculitis. If remained untreated, 25% cases can develop coronary artery lesions. Intravenous immunoglobulin can help reduce the prevalence of coronary artery lesions to 2-4%. But 10-15% patients are resistant to immunoglobulin, and have persistence or reoccurrence of fever 48 hours after initial treatment. Our study was aimed to predict the possibility of immunoglobulin resistance in patients with Kawasaki disease younger than 1-year-old.

Methods

We reviewed 92 patients with Kawasaki disease younger than 1-year-old, who were hospitalized in the Department of Pediatrics of Peking University First Hospital from June 2007 to August 2016. 11 patients were resistant to intravenous immunoglobulin and 81 patients responded to it. We recorded neutrophil-to-lymphocyte ratio from complete blood count, analyzed difference between patients with different intravenous immunoglobulin responses, and studied the correlation between neutrophil-to-lymphocyte ratio and the different intravenous immunoglobulin responses.

Results

Patients within 1-year-old experienced significantly increased neutrophil-to-lymphocyte ratio in immunoglobulin resistance group (p=0.01). When neutrophil-to-lymphocyte ratio was at least 2.51 in patients within 1-year-old, the sensitivity and specificity to predict immunoglobulin resistance was 0.636 and 0.802, respectively, with area under the curve of 0.742 (95% confidence interval 0.604-0.880, p=0.010).

Conclusions

For patients younger than 1-year-old, increased peripheral blood neutrophil-to-lymphocyte ratio can help in predicting immunoglobulin resistance in Kawasaki disease.
STUDY ON THE IMMUNOCYTE VARIATION FEATURE OF CHILDREN HAND-FOOT-MOUTH DISEASE IN DIFFERENT AGE GROUPS
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Background and aims
To disclose the immunocyte variation feature of children HFMD in different age groups.

Methods
1090 HFMD children of different ages were recruited to collect their EDTA anticoagulation peripheral blood. Fluorescence labeling monoclonal antibodies against CD3, CD4, CD8, CD19 and CD16/CD56 were separately used to mark WBCs after erythrocytolysis and flow cytometry was employed to analyze the cell content. SPSS 19.0 software showed the constituent ratio of different cell content ranges and univariate ANOVA results of heave amplitude of the cells among three age groups namely of 0-0.5y, 0.5-5y and 5-12y.

Results
89.08% of the patients belonged to 0.5-5y group and there were significant differences on constituent ratio of CD3\(^+\), CD4\(^+\), NK\(^+\) and CD19\(^+\) cells (p<0.0167) (Figure 1) and heave amplitude of CD3\(^+\) and CD19\(^+\) cells (p<0.05) (Figure 2) against the other two groups.

Conclusions
The significant differences of the immunocytes on constituent ratio and heave amplitude within 0.5-5y indicate the disease severity of this age group. More attention should be paid to immunologic monitoring and balance regulation to improve prophylaxis and prognosis of the patients within this age range.
This study investigated the genetic structure of pneumococcal carriage isolates from nasopharynx in Korean children, focusing on serotype 15B and 15C pneumococci. After the introduction of extended-valency pneumococcal conjugate vaccines (PCVs) in Korea, the changes in genetic structure of serotypes 15B and 15C were observed.

Between January 2014 and December 2016, a total of 2357 nasopharyngeal swabs were collected from children at Seoul National University Children's Hospital. Each pneumococcal isolate was identified using standard microbiological techniques and serotype was determined by Quellung reaction. Antimicrobial susceptibilities were tested by an E-test. Among 355 pneumococcal isolates, 39 isolates were 15B/C serotypes. The multi-locus sequence typing (MLST) was analyzed for the 13 randomly selected isolates.

Among the 13 isolates, 7 isolates were 15B and 6 isolates were 15C. Among them, the common serotypes were ST166 (3/13, 23.1%), ST83 (3/13, 23.1%), and ST10161 (2/13, 15.4%). One ST83, ST320, ST695, ST1464, and ST8199 were identified individually. One ST320 and One ST1464 of serotype 15B/C pneumococci belonged to CC320, a multidrug resistant 19A clone. These strains of serotype 15B/C in CC320 showed a multidrug resistance.

The introduction of extended-valency PCVs has resulted in the change of genetic structure of pneumococcal carriage isolates in Korean children. Our data suggested that multidrug resistant serotype 15B/C clone has emerged by capsular switch after the use of extended-valency PCVs.
CLINICAL ANALYSIS OF INCOMPLETE KAWASAKI DISEASE COMPLICATED BY SEPSIS-LIKE MANIFESTATIONS

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Objective: To investigate the clinical features of incomplete Kawasaki disease complicated by sepsis-like manifestations, to reduce misdiagnosis and delayed treatment of incomplete Kawasaki disease.

Methods: A retrospective of clinical data of 7 cases (5 cases of boys and 2 cases of girls) of incomplete Kawasaki disease complicated by sepsis-like manifestations in hospital collected from May 2016—June 2017.

Results: In the early 5 days, the laboratory indices of fever process were in line with sepsis, but the blood culture was negative. All of the cases were complicated by respiratory tract infection, the coronary artery’s width of which was greater than the children’s in the same age group, but <4mm with rough pipe wall. ESR, CRP, PCT, WBC and PLT increased by different degrees, especially ESR and PLT. During 5-10 days, once the diagnosis of incomplete Kawasaki disease was confirmed, stop the usage of antibiotics, and using gamma globulin(2g/kg) within 48h timely can bring down a fever. And inflammation index(CRP, PCT, WBC) returned to normal around 1 week.

Conclusion: The incomplete Kawasaki disease complicated with sepsis-like manifestations is easy to misdiagnose as sepsis in the early days, with antibiotic treatment. Once the fever continues for more than 5 days, especially with the increasing of laboratory indices (ESR, PLT) increased significantly or progressively, the echocardiography should be prompted. Once the diagnosis is confirmed, the clinical symptoms of antibiotic will be relieved rapidly with the use of gamma globulin.
A RETROSPECTIVE REVIEW OF THE EFFECTIVENESS OF FIRST DOSE THERAPEUTIC DRUG MONITORING OF AMIKACIN, GENTAMICIN AND VANCOMYIN IN THE PAEDIATRIC POPULATION

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Background and aims

Routine therapeutic drug monitoring (TDM) has become standard clinical practice in the use of gentamicin, amikacin and vancomycin, to optimise efficacy and reduce nephrotoxicity. Therapeutic drug monitoring after the first antibiotic dose was adopted in our institution. Hence this study aims to evaluate if first dose TDM (FD) results in fewer days to reach optimised serum drug concentrations compared to steady state TDM (SS).

Methods

A single-centre retrospective cohort study was conducted at KK Women’s and Children’s Hospital, Singapore. Patients aged one month to 18 years old who received amikacin, gentamicin, or vancomycin between October 2012 to March 2016, and had at least 1 peak and trough serum drug level done, were included. The primary endpoint was time taken to reach target serum drug concentrations. Secondary outcomes include evaluation of time to microbial clearance and resolution of fever.

Results

There were a total of 334 courses of amikacin, 211 courses of gentamicin and 140 courses of vancomycin included in the study. Time taken to reach target drug concentrations was assessed with Kaplan-Meier analysis. Days to optimize therapy (median, interquartile range) was significantly shorter in FD for amikacin [FD: 1.50 (1.00 – 2.00) vs SS: 2.55 (2.00 – 3.95), p<0.001] and gentamicin [FD: 1.66 (1.13 – 2.18) vs SS: 3.54 (2.08 – 4.96), p=0.003] but not vancomycin [FD: 1.05 (0.46 – 1.52) vs SS: 1.27 (0.69 – 1.76), p=0.285]. Secondary outcomes were not significantly different between FD and SS across all groups.

Conclusions

First dose TDM for gentamicin and amikacin allows for faster attainment of target serum concentrations. Further validation of its impact on actual clinical outcomes may be required.
Background and aims

Group A Streptococcus (GAS) is a common pathogen in skin and soft tissue infections. Most infections have a benign course although severe invasive illness, including toxic shock syndrome (TSS) and necrotizing fasciitis, can occur. TSS is rare in children, and the diagnosis should be considered in the presence of soft tissue infection presenting with signs of toxicity and marked wound edema.

Objectives

Report a case of streptococcal TSS after soft tissue minor trauma.

Methods

Case-report

Results

14-years-old female, previously healthy, was admitted for high fever, vomits and left arm inflammatory signs evolving over a 3 days period. She reported palmar minor trauma with a pencil tip fifteen days prior to admission. She had a toxic appearance, a palmar blister and extensive inflammatory signs on her right arm and thorax, but was hemodynamically stable. Laboratory investigation revealed leucocytosis and CRP 29 mg/dL. Cellulitis was considered and she started flucloxacylin empirically. After 24 hours she evolved with shock with erythroderma, hypotension, renal and liver dysfunction. Antibiotherapy was changed with transitory improvement. Pectoral inflammatory signs worsened and surgical exploration and drainage were performed. GAS was isolated in the samples. She completed 52 days of meropenem, clindamycin and vancomycin, along with hyperbaric treatment, with clinical and imagiological improvement.

Conclusions

This case reports a GAS-TSS in association with necrotizing fasciitis. A high index of suspicion is crucial when cutaneous findings are discreet early in the course of the disease. TSS is potentially fatal if diagnosis and management are delayed.
COMMUNITY ACQUIRED SEPSIS IN THE GAMBIA 2005-2015: THE EFFECT OF POLYVALENT PNEUMOCOCCAL CONJUGATE VACCINES ON AETIOLOGY

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Background and aims

Invasive bacterial infections cause significant morbidity and mortality in sub-Saharan African. Many are vaccine preventable although the impact of new vaccines and vaccine policies on disease patterns in communities and populations is rarely documented. We retrospectively compared disease trends in relation to the vaccines introduced in order to detect changes in the pathogens responsible for disease.

Methods

Data for patients over 2 months with positive blood and cerebrospinal fluid (CSF) cultures between January 2005 and December 2015 were analysed. Surveillance periods were determined over the following three time periods: pre-PCV introduction (January 2005-December 2009), PCVs introduction (January 2010 - December 2011) and post-PCV introduction (January 2012 - December 2015). We compared disease prevalence between pre-PCV and post-PCV introduction.

Results

We evaluated 15818 cultures and analysed 982 pathogens from 957 patients. The most common organisms were S. pneumoniae (261/982; 26.6%), S. aureus (210/982; 21.4%), E. coli (103/982; 10.5%) and NTS (94/982; 9.6%). S. pneumoniae prevalence significantly dropped from 35.2% to 16.6% across all age groups post-PCV and inversely, S. aureus proportionally increased from 16.9% to 27.2% across all age groups. A decrease in vaccine serotypes was noted from 59.8% to 43.1% with a concurrent increase in non-vaccine serotypes from 17.9% to 39.7%, 12F being the more prominent. No change was noted for E. coli and NTS

Conclusions

S. aureus has emerged as the leading cause of invasive disease after introduction of PCV vaccine. This apparent replacement by another pathogen suggests that multiple approaches to tackling invasive bacterial disease in sub-Saharan Africa is warranted.
PREVALENCE OF PANTON-VALENTINE LEUKOCIDIN (PVL) IN COMMUNITY-ACQUIRED STAPHYLOCOCCUS AUREUS ISOLATES IN THE GAMBIA: A 10 YEAR PERIOD RETROSPECTIVE PILOT STUDY

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Background and aims

*Staphylococcus aureus* is a major human pathogen and can cause disease due to infection or production of toxins. Methicillin-resistant *S. aureus* infections were previously associated with healthcare acquisition, with emergence of community-acquired (CA-MRSA) infections. Panton-Valentine leukocidin (PVL) is a two component toxin associated with virulence in Methicillin sensitive *S. aureus*, and PVL-positive methicillin susceptible *S. aureus* is considered an important virulence factor for CA-MRSA. This study aims to determine the PVL prevalence and its association with antibiotic resistance of *S. aureus* in The Gambia.

Methods

All invasive *S. aureus* strains from patients investigated for invasive infections from 2005 to 2015 were retrieved. For each invasive strain, three cutaneous isolates recovered from a patient of similar age distribution and within two weeks were included. Susceptibility was done according to CLSI and genomic DNA was extracted using QIAGEN mini kit. (Qiagen, Netherlands). A conventional gel based PCR was done to confirm presence of the lukF and lukS PVL genes.

Results

Overall prevalence of PVL was high 190/306; 62.1%. Evidence of a higher prevalence was in invasive samples (56/78; 71.8%) than in soft tissue (14/228; 58.8%) p=0.041. Antimicrobial resistance included chloramphenicol (4.9%), cefoxitin (2.6%), ciprofloxacin (3.6%), erythromycin (8.9%), gentamicin (5.2%) penicillin (92.5%), tetracycline (40.8%) and sulfamethoxazole-trimethoprim (23.5%). There was no association of PVL with antimicrobial resistance.

Conclusions

PVL expression is high in Gambian MSSA and this warrants monitoring as it could potentially lead to the spread of virulent PVL-positive CA-MRSA strains, especially in an era when *S. aureus* has emerged as the prevalent pathogen causing bacteraemia.
TRENDS, ANTIBIOTIC RESISTANCE AND CONTEXTUAL ASSOCIATIONS OF SALMONELLA TYPHI AND PARATYPHI IN PAKISTAN: A 24 YEAR PERSPECTIVE
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**Background and aims**

Typhoid remains a major global cause of morbidity and mortality particularly in developing countries and low and middle income countries and Pakistan is one of the typhoid endemic countries.

**Methods**

The objective of this review is to analyze observed changes in burden of typhoid in Pakistan and its association with various contextual factors. A retrospective cohort study on blood culture positive typhoid fever and antibiotic resistance was conducted from three large tertiary care hospitals in Pakistan and the contextual factors data was obtained from primary household surveys.

**Results**

We report data of a total of 17,387 S. Typhi and 8,286 S. Paratyphi A and B blood culture positive specimens from a total of 798,137 blood cultures. The results suggest an overall decline in the incidence of typhoid as the positivity rates for S. Typhi declined from 7.19% in 1992 to 1.61% in 2015 and S. Paratyphi (A and B) from 1.29% to 0.39%. Subgroup analysis suggest that S. Typhi is more prevalent in adults above 18 years of age, while S. Paratyphi is more prevalent in children 5-18 years of age although all age groups have observed significant decline. The relative contribution of S. Paratyphi to the overall typhoid confirmed cases has increased from 16.8% in 1992 to 23% in 2015. The analysis suggests high burden of multi drug resistant (MDR) S. Typhi strains. A statistically significant association of water, sanitation indicators and literacy rates was observed with typhoid positivity rates.

**Conclusions**

Existing progress is far from what is desired and focused targeted strategies to control typhoid is needed.
EFFECTS OF VITAMIN A ON SEVERITY AND IMMUNITY OF CHILDREN WITH HAND FOOT AND MOUTH DISEASE

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Objectives: To investigate the relationships between the change in serum vitamin A (VA) level in children with hand-foot-mouth disease (HFMD) and its severity, and analyze the effect of VA level on anti-viral immunity in children.

Methods: Serum VA level was measured using high-performance liquid chromatography. Serum IFN-α and EV71-IgM antibody levels were determined using enzyme-linked immunosorbent assay. Multivariate analysis of influencing factors for the disease progression was performed by logistic regression model.

Results: In these 410 HFMD patients, the average serum VA level was (0.78±0.25) μmol/L. The serum VA level was (0.69±0.27) μmol/L in severe cases, which was significantly lower than that in patients with moderate disease [(0.78±0.25 μmol/L), P<0.05]. Compared with the control group, the serum IFN-α level significantly increased in the HFMD group, and the serum IFN-α level was significantly higher in the VA-normal group than in the VA-deficient group [(109.42±40.51 pg/mL) vs (59.17±21.73 pg/mL), P<0.05]. The serum EV71-IgM antibody detection rate was 67.1% in the VA-normal group, which was significantly higher than that (54.2%) in the VA<0.7 μmol/L group (VA-deficient group) (P<0.05). EV71-IgM antibody positive rate (odds ratio (OR) 2.317, 95 % confidence interval (CI) 1.240–4.332), blood glucose (OR 6.601, 95 % CI 3.696–11.787), creatine kinase (OR 2.537, 95 % CI 1.014–6.348) and VA (OR 0.042, 95 % CI 0.011–0.154) were four predominant factors affecting the condition of the children with HFMD.

Conclusions: VA deficiency is common in children with HFMD, which may lead to decreased immunity against HFMD. The decreased antibody positive rate, increased blood glucose level (Glucose) and creatine kinase (CK) level can also aggravate HFMD in the children.

A total of 410 pediatric HFMD patients were enrolled in this study. 150 age- and gender-matched healthy children without infection were enrolled as control group. Average daily dietary VA intake was determined using 1-week dietary recall method and analyzed based on clinical conditions. Serum VA level was measured using high-performance liquid chromatography. Serum IFN-α and EV71-IgM antibody levels were determined using ELISA.

Daily dietary VA intake was below Dietary Reference Intake (DRI) in 88.5% of patients. In 410 HFMD patients, average serum VA level was (0.78±0.25)μmol/L and 162(39.5%) of them had a serum VA level<0.70μmol/L. The serum VA level was (0.69±0.27)μmol/L in severe cases, which was significantly lower than that in patients with moderate disease [(0.78±0.25μmol/L), P<0.05]. The incidence of severe HFMD was 41.4% in the VA-deficient group, which was significantly higher than that in the VA-normal group (26.6%)(P<0.05). Compared with control group, the serum IFN-α level significantly
increased in HFMD group, and serum IFN-α level was significantly higher in VA-normal group than in VA-deficient group [(109.42±40.51 pg/mL) vs (59.17±21.73 pg/mL), P<0.05]. The serum EV71-IgM antibody detection rate was 67.1% in VA-normal group, which was significantly higher than that (54.2%) in the VA<0.7 μmol/L group (VA-deficient group) (P<0.05).

VA-deficient is common in children with HFMD, which may lead to decrease the immunity against HFMD in children.
Background and aims

Non-albicans Candida is an important pathogen for intensive care units. The aim of this study was to evaluate the clinical characteristics of children with invasive infection due to non-Albicans Candida.

Methods

Between 2010-2015, all children with infections due to fungal pathogens isolated from sterile body fluids have been enrolled in tertiary PICU. Clinical findings, risk factors, and prognosis have been noted from medical records.

Results

Totally 55 Candida sp. have been obtained from sterile body sites, 29 out of them were non-Albican Candida (52.7%) and 26 were Candida albicans (47.3%). Majority of the non-Albican Candida cases are immune-compromised and are due to C. parapsilosis (55.1%) and followed by C. glabrata (31%), C.keyfr (6.9%), C.krusei (3.5%) and C.tropicalis (3.5%). Children with invasive infection due to non-Albicans Candida had at least one risk factor including previous use of broad spectrum antibiotic (93.1%), receiving total parenteral nutrition (93.1%), required mechanical ventilation (89.7%), stress ulcer prophylaxis (89.7%), presence of central venous catheter (79.3%), required surgical intervention (72.4%), previous use of antifungal prophylaxis (72.4%) and presence of nasogastric tube (69.3%).

Previous antifungal prophylaxis, requiring mechanical ventilation, total parenteral nutrition, urinary catheterization, previous surgical intervention are higher in children with non-Albicans Candida than the children with Candida albicans. Mean PRISM score were higher among children with non-Albicans Candida infections than the children with Candida albicans infections. Length of PICU and hospital stay were also higher in children with non-Albicans Candida infection.

Conclusions

Non-albicans Candida infections are increasing infections and should be kept in mind in PICU among children requiring invasive procedure and underlying immune-compromised conditions.
CLINICAL CHARACTERISTICS AND PROGNOSTIC RISK FACTORS IN CHILDREN WITH BLOODSTREAM INFECTION OF CANDIDA ALBICANS

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Background and aims: Candidemia is a life-threatening fungal infection and it can affect patients of all ages, especially children. The mortality rate is as high as 40%-80%. The aim of the present study was to investigate the clinical characteristics and prognosis of Candida albicans bloodstream infection (BSI) in children and analyze the risk factors of prognosis.

Methods: We investigated the clinical characteristics, treatment and prognosis of the patients with BSI of Candida albicans in Beijing Children's Hospital from January 2008 to September 2013, and analyze the prognostic risk factors.

Results: A total of 46 cases were identified, including 8 (17.4%) from the pediatric intensive care unit, 7 (15.2%) from the neonatal intensive care unit, 10 (21.7%) from the hematology ward and 21 (45.6%) from general wards. More than half (56.5%) had underlying chronic comorbidities, and the majority (65.2%) had implantation of catheter or other artificial device, 2 (4.3%) patients had immune defects. All patients were presented with fever, 1 (2.2%) with central nervous system (CNS) involvement, 1 (2.2%) with cardiac involvement, 11 (23.9%) with lung involvement, 6 (13.0%) with enterocolitis involvement. All the isolates were susceptible to the antifungal agents tested. 54.3% (25/46) received effective antifungal agents within 24 hours from candidemia onset. The mortality rate was up to 34.8% (16/46). Logistic regression analysis showed premature (P=0.033, OR=6.72, 95% CI 1.167-38.704) and deep-venous catheterization (P=0.007, OR=7.754, 95% CI 1.741-38.543) were independent risk factors associated with prognosis.

Conclusion: Candida albicans bloodstream infection is characterized by more underlying chronic comorbidity, serious illness, and high mortality. Premature and deep-venous catheterization are risk factors for the prognosis.
Kikuchi Lymphadenopathy is type of lymphadenitis. It's an uncommon, idiopathic, generally self-limited disease. Kikuchi disease, clinically and histologically, can be mistaken with lymphoma or SLE. Disease's recurrence is unusual and fatality is rare. This case report is made for our knowledge to understand management of Kikuchi Lymphadenopathy.
AN UNCOMMON CASE OF “LUMPY JAW SYNDROME” IN A TEENAGE GIRL

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Background and aims

Actinomycosis is a rare granulomatous infectious disease caused by Actinomyces spp. The most common clinical presentation is “lumpy jaw syndrome”.

Methods

Case-report.

Results

We discuss a case of a 16-year-old female teenager who sought the Emergency Department complaining of left painful hemifacial swelling evolving over a three months period. She denied fever, weight loss or any other complaints. A hard, round and painful mandibular mass was noted, adherent to the subjacent plans and measuring around 6 cm. Trismus was also noted and intraoral observation was normal. Cervicofacial CT and MRI showed a subacute/chronic inflammatory process affecting both the masseter muscle and the mandible ramus and a small amount of air on the left third molar root. Although an infectious cause was more likely, we could not completely exclude a neoplastic etiology. Therefore, she underwent both fine needle aspiration and ultrasound guided biopsy, which were not conclusive, showing only inflammatory cells. All cultures of the collected material and PCR for bacterial DNA and fungi were negative at that time. A surgical biopsy of the mandible and masseter muscle was then performed, along with extraction of the third molar. Actinomyces odontolyticus was isolated in the samples. She received intravenous antibiotics for four weeks, with clinical improvement, and was discharged with an oral antibiotic regimen and scheduled follow up appointments.

Conclusions

Actinomycosis poses a diagnostic challenge, specially making a distinction between neoplastic etiologies and other infections. It is important for clinicians to consider this etiology when evaluating masses affecting the cervicofacial region in the pediatric population.
CLINICAL ANALYSIS OF 26 CHILDREN PATIENTS WITH MYCOPLASMA PNEUMONIAE INFECTION COMPPLICATED WITH ENCEPHALITIS

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Background and aims

To analyze the clinical characteristics, diagnosis and treatment of mycoplasma pneumoniae infection complicated with encephalitis in children.

Methods

The anti-MP IgM in serum and/or in cerebrospinal fluid (CSF) was detected with specific immune agglutination in 26 positive and the clinical data were analyzed retrospectively.

Results

The incidence of MP encephalitis was mainly in children of school age, 18 of 26 cases accounting for 69.2% in 6-12 years. The nervous system symptoms appear in the course of 1 to 12 days. All cases with fever as the first symptom, and 24 of headache, 20 of vomiting, 15 of convulsions, 17 of lethargy, 11 of cough, 1 of coma, 13 of meningeal irritation positive, Babinski positive in 3 cases, 9 cases of lung rales. CSF pressure elevate, normal or slightly higher number of cells and protein, and sugar, chloride is normal. 26 cases with abnormalities EEG. Anti-MP-IgM was positive in serum in 25 cases, which 12 in CSF and 11 in both serum and CSF. MR showed abnormal findings in 18 of 26 cases, eight showed multiple and scattered spot-like or patch-like lesions in white matter, 4 showed diffuse abnormal signal in hemispheres, 3 showed abnormal signal near the posterior corn of lateral ventricles with cerebral ventricle enlargement, and 3 showed gyrus-like abnormal signal in cortex.

Conclusions

MP encephalitis should be diagnosed according to clinical symptoms, signs, laboratory assistant examination, and MR findings of MP encephalitis have some characteristic, MR examination is helpful to realize the injured conditions in cerebellum and to evaluate the prognosis.
Background and aims

Bacterial meningitis remains one of the major challenges in infectious diseases, leading to sequel in many cases. However, a prompt diagnosis of the causative microorganism is critical to significantly improve outcome of bacterial meningitis. Although various targeted tests for CSF samples are available, time-consuming CSF culture-based approaches still represent the standard of care for the identification of bacteria.

Methods

Here we describe the establishment of a complete diagnostic workflow for the identification of infectious microorganisms in cerebral spinal fluid samples of pediatric bacterial meningitis patients in the department of infectious diseases from Beijing Children's Hospital based on unbiased sequence analyses by next-generation sequencing (NGS).

Results

In total, we had 99 bacterial meningitis patients in our study. Combined with NGS, 68.7% (68 cases) were etiologically confirmed. 55 (55.6%) cases were etiologically confirmed by clinical microbiology methods. 34 (34.3%) cases were etiologically confirmed by NGS. We also identified species from samples where blood and/or CSF cultures were negative. Two cases with cytomegalovirus infection and one with Taenia saginata asiatica were confirmed by NGS. The main pathogens identified in this study were Streptococcus pneumoniae (n=27, 37.5%), group B streptococcus (n=15, 20.8%), Staphylococcus aureus (n=7, 9.7%), Escherichia coli (n=7, 9.7%).

Conclusions
NGS can be a promising alternative diagnostic platform for critically ill patients suffering from bacterial meningitis pediatric patients.
CLINICAL FEATURES OF ESCHERICHIA COLI ENTERITIS IN KOREAN CHILDREN: THE RESULTS OF CLINICAL APPLICATION OF STOOL PCR ASSAY

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Background and aims

Clinical features of children with *Escherichia coli* enteritis diagnosed by a polymerase chain reaction (PCR) assay for stool samples in a developed country was investigated.

Methods

Medical records of children diagnosed with *E. coli* enteritis using a multiplex PCR assay discriminating among *Salmonella* spp. and diarrheagenic *E. coli* strains were reviewed. Clinical features of *E. coli* enteritis were investigated and compared with those of *Salmonella* enteritis.

Results

*E. coli* enteritis and *Salmonella* enteritis were diagnosed in 39 and 43 patients, respectively. The median age of the patients with *E. coli* enteritis was 4 years (range: 0-17), and 71.8% of them were boys. Enteropathogenic *E. coli* (48.7%) and enteroaggregative *E. coli* (28.2%) were the most frequent strains. Significantly less children with *E. coli* enteritis experienced fever (79.5% vs. 97.5%, *P*=0.012), abdominal pain (64.1% vs. 90.7%, *P*=0.004) and hematochezia (10.3% vs. 46.5%, *P*<0.001) compared to those with *Salmonella* enteritis. Empirical 3rd generation cephalosporins were given to 79.1% of patients with *Salmonella* enteritis and 38.5% of patients with *E. coli* enteritis, and significantly less children with *E. coli* enteritis experienced fever lasting for more than 3 days compared to those with *Salmonella* enteritis (15.4% vs. 55.8%, *P*<0.001). For the children with *E. coli* enteritis, fever duration was not significantly different between children receiving antibiotic therapy and those not receiving.

Conclusions

Enteropathogenic *E. coli* was most common among diarrheagenic strains, and *E. coli* enteritis showed milder illnesses than *Salmonella* enteritis. Antibiotic therapy for *E. coli* enteritis seemed to have a modest effect.
Rotavirus infection (RVI) characterized by nonspecific clinical manifestations, which necessitates its laboratory confirmation.

**Aim** To analyze the case of severe rotavirus disease curse in the children.

**Materials and Methods** Clinical case in the medical practice with following analysis interpretation

**Results** The girl N, 1.3 years was admitted to in the emergency department of the Regional Clinical Infectious Hospital, Uzhhorod on the 4-th day of illness, with next complaint: fever (39,8°C), nausea, repeated vomiting continual, profuse watery stools (more than 20 times), weakness, weight loss, nasal congestion and mucous discharge, coughing. The same clinical presentation was in older child a week before. Diagnostic pathological symptoms - general condition was heavy at hospitalization, consciousness is clear. The abdomen was soft by palpation, flatulence, painful in the epigastric area and along the intestine, peristalsis was weakened. Liver increased (2.5 cm) what was confirmed by digestive tract Ultrasoundography. Urinating was reduced. Quick test for virus detection - adeno - negative, rota - positive. The following tests were performed for the diagnosis confirmation: Urine diastase - 286.1g/hour/l. Blood tests show the next: Sugar - 2.8mmol/l, Alkaline Phosphatase - 2978mmol/l, Albumen - 418mmol/l, AFL IgM - 1.67IU/ml, AFL IgG - 2.14 IU/ml, IL-1 - 0.22 IU/ml, IL-6 - 5.30 IU/ml, IgG - 3.07 IU/ml, IgM - 0.33 IU/ml, Fe - 31.33mkmol/l, Cu - 7.59 mkmol/l, Zn - 0.67 mkmol/l, P - 67.2 mkmol/l.

Final diagnosis was: Rotavirus disease, gastro enterocolitis type, nasopharyngitis, severe course. Degidration IIg. Reactive pankreatopaty. Anemia Igr.

**Conclusions** RVI had progressive, severe course and imbalance basic homeostasis links in connection with a parents late appeal for medical help. which complicated the treatment process and prolongated of staying time in the hospital.
CLINICAL ANALYSIS OF ANTIVIRAL THERAPY FOR CHRONIC HEPATITIS B CHILDREN WITH INTERFERON ALPHA
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Background and aims

To investigate the efficacy of interferon-alpha(IFN-α) therapy in chronic hepatitis B children.

Methods

Laboratory tests were retrospectively analysed in 19 chronic hepatitis B children, who visited our hospital and treated with IFN-α from January 2003 to April 2017.

Results

(1) Nineteen children patients with hepatitis B included 8 boys and 10 girls. All children had no obvious clinical manifestations. The mean age of the patients was 4.53±2.83 years old. The median antiviral period was 47.2±10.3 weeks. The median followed-up term was 3.92 years. (2) The median ALT level was 126U/L before treatment. ALT levels of eighteen children fell into normal at average 22-week treatment, and one at 6-week after IFN-α withdraw. (3) Before treatment, the median HBV-DNA load was 8.13×10⁶IU/mL. Seventeen children became HBV-DNA negative at average 24.4-week treatment, one at 48-week after IFN-α withdraw and transient HBV-DNA negative was observed in one case at 24-week treatment. (4) HBeAg seroconversion was occurred and kept in 16 of 17(94.1%) HBeAg positive patients by average 16-week treatment. Four of them became HBeAg negative at 4-week treatment, 5 at 12-week, 6 at 16-32 weeks, and 1 at 64-week. (5) HBsAg seroconversion was occurred in 5(26.3%) cases. Two of them became HBsAg negative at 2-week treatment, 2 at 24-week and 1 at 48-week. (6) Mild flu-like symptoms of fever and rhinorrhea and transient granulocytopenia appeared only at the beginning of treatment in some children. No severe adverse events were observed.

Conclusions

The antiviral therapy of 48-week IFN-α achieved high rates of HBeAg and HBsAg seroconversion, and the patients well tolerate the therapy.
CLINICAL ANALYSIS OF ANTIVIRAL THERAPY FOR CHRONIC HEPATITIS B CHILDREN WITH PEGYLATED INTERFERON ALPHA

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Background and aims

To investigate the efficacy of pegylated interferon alpha (Peg-IFN-α) in the treatment of children with hepatitis B, and to provide more evidence for ideal antiviral therapy for children with chronic hepatitis B (CHB).

Methods

Clinical manifestations, baseline characteristics, related laboratory tests and adverse events were retrospectively analyzed in 15 children with CHB, who visited Children's Hospital of Fudan University and treated with Peg-IFN-α from July 2012 to April 2017.

Results

(1) Baseline characteristics: fifteen children patients with hepatitis B included 10 boys and 5 girls. All children had no obvious clinical manifestations. The mean age of the patients was 8.24±3.11 years old. The median antiviral period was 48 weeks. And the median followed-up term was 90 weeks.

(2) The median ALT level was 178 U/L before treatment. ALT levels of twelve children fell into normal at average 20 weeks during treatment, and three at 12 weeks after Peg-IFN-α withdraw.

(3) Before treatment, the median HBV-DNA load was 2.94×10⁷ IU/mL. Fourteen children became HBV-DNA negative at average 24 weeks during treatment, and one persists HBV-DNA positive.

(4) HBeAg seroconversion was occurred and kept in 9 of 11(81.8%) HBeAg positive patients by average 20 weeks during treatment.

(5) HBsAg seroconversion was occurred and kept in one case at 20 weeks during treatment.

(6) Mild flu-like symptoms and transient granulocytopenia appeared in the early stage of treatment in some children. No severe abnormal results were observed in complete blood count and thyroid function.

Conclusions

The antiviral therapy of 48-week Peg-IFN-α achieves a good response in children with CHB, and most of the patients well tolerate the therapy.
EVALUATION OF BINAXNOW® STREPTOCOCCUS PNEUMONIAE ANTIGEN TEST ON CEREBROSPINAL FLUID SAMPLES IN PEDIATRIC PATIENTS WITH PURULENT MENINGITIS

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Background and aims

Purulent meningitis is a common invasive pneumococcal disease in children. In today’s routine diagnostics, cerebrospinal fluid culture (CSFC) is the standard method for the detection of pneumococcal meningitis. However, identification based on bacterium cultivation is time consuming, and previous antibiotics lower the positivity rate of cultivation. The objective of the study is to evaluate a rapid identification, BinaxNOW® Streptococcus pneumoniae antigen test on cerebrospinal fluid samples in pediatric patients with purulent meningitis.

Methods

Streptococcus pneumoniae antigen of all cerebrospinal fluid samples were detected with BinaxNOW® antigen test and 16s rDNA-PCR was defined as gold standard. Results of CSFC were recorded in the study.

Results

One hundred and eighty-four cerebrospinal fluid samples (111 from male, aged from 1d to 13y8m, median was 2.1m) were collected during 2015-2016. Based on cultivation, 52 (28.3%, including 15 strains of Escherichia coli) were positive and pneumococci were identified in 10 samples (5.4%). However, pneumococcal antigen were found in 33 (17.9%) samples, and the sensitivity and specificity were and 100% and 99.3% respectively. The sensitivity of BinaxNOW® antigen test was significantly higher than that of cultivation method (sensitivity was 31.3%).

Conclusions

BinaxNOW® Streptococcus pneumoniae antigen test is a rapid identification method with high specificity and sensitivity, which significantly improving the diagnosis rate of pneumococcal meningitis.
Background and aims

Vulvovaginitis is one of the most common causes of gynecological problems in prepubescent girls. However, studies that both include large numbers of cases and address pathogenic microorganisms are limited. The objective of the study is to study the treatment of vulvovaginitis in prepubescent girls both the bacteriological and mycological aspects and the drug resistance of isolates were analyzed.

Methods

Vaginal introitus swabs, collected from each patient diagnosed as vulvovaginitis in 2015 were cultured with standard microbiological techniques. The Vitek system was used to identify bacteria and drug susceptibility testing. The disc diffusion method was used to assess the drug resistance of Haemophilus influenzae and Streptococcus pyogenes.

Results

A total of 801 cases were diagnosed with vulvovaginitis and 469 special pathogens were isolated from 464 patients (57.9%). The most common was Streptococcus pyogenes (23.7%), followed by Haemophilus influenza (23.5%), Escherichia coli (18.6%) Staphylococcus aureus (8.3%), and Candida albicans (7.2%). All Streptococcus pyogenes strains were found to be sensitive to penicillin, 73.6% of Haemophilus influenzae strains were ampicillin-sensitive, 61.5% of Staphylococcus aureus strains were oxacillin-sensitive, and 92.0% of Escherichia coli strains were found to be cefoxitin-sensitive. Among patients with specific pathogens, 14% experienced improvement of symptoms with perineal hygienic care alone while 84.9% saw improvement with topical or oral antibiotics.

Conclusions

Streptococcus pyogenes, Haemophilus influenza, and Escherichia coli are common isolates of prepubescent vulvovaginitis; and topical antibiotics based on ofloxacin gel, associated with povidone-iodine or benzalkonium-chloride usually showed clinical and microbiological effectiveness in first-line treatment, and oral antibiotics should be included as a second-line treatment.
ANALYSIS ON 32 CASES OF INVASIVE STREPTOCOCCUS PYOGENES INFECTIONS IN CHILDREN DURING 2007 TO 2016, A MULTI-CENTER STUDY
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Background and aims
Invasive disease due to Streptococcus pyogenes are rare in children and data of such patients are limited. The aim of this study is to know the clinical characteristics of invasive Streptococcus pyogenes infections in children.

Methods
All cases with Streptococcus pyogenes growth in sterile source specimens from 2007 to 2016 were included by checking the Lis system and case record, clinical characteristics were collected for analysis.

Results
Thirty-two cases of invasive Streptococcus pyogenes infections, 15 male, were identified and the mean ages of the patients was 5.09±4.73 years. Thirty-one (96.9%) had fever (mean, 39.4°±0.9°C), 37.5% had underlying disease, 59.4% had suppurative lesion of skin, and 21.9% had scarlatiniform rash. The mean duration of chief complaint was 3.34±2.56 days. Eight had been given antibiotics prior to hospitalization. Seven complicated with streptococcal toxin shock syndrome (STSS), 4 with purulent meningitis and 3 with suppurative osteoarthritis. Non-strain was resistant to penicillin G, ceftriaxone, vancomycin and linezolid, while to tetracycline, clindamycin and erythromycin, the resistance rates were 82.6%, 80.0% and 79.3% respectively. Thirty-one (96.9%) were treated with β-lactams and 26 (87.5%) were treated with 2 or more than 2 antibiotics. There were 23 (71.9%) cases of curative or improved, and 6 (18.8%) of death of which 5 complicated with STSS. Three cases were lost to follow up after they abandoned treatment.

Conclusions
Invasive Streptococcus pyogenes infection often developed after skin or soft tissue was infected in children. The mortality of those complicated with STSS is high; Penicilllin is an effective antibiotic for the treatment of GAS infection.
THE INFLUENCE OF SPV IN THE ANTIBIOTIC RESISTANCE OF SALMONELLA TYPHIMURIUM ISOLATED FROM DIARRHEA PATIENTS

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Background and aims

The incidence of multidrug-resistant salmonella infections is increasing in Jiangxi district of China, which increases the risk for treatment failure. Previous studies have shown that the host resistance factor Nramp1 up-regulates the expression of Salmonella pathogenicity island-2 virulence genes. Inactivation of AcrD led to changes in the expression of 403 genes involved in fundamental processes, including basic metabolism, virulence, and stress responses. Our previous study indicate that Salmonella typhimurium is the main strain of the 80 Salmonella strains isolated from the fecal of patients and the higher spv expression, the severer symptom.

Methods

On this basis, we construct the spvB gene-deleted mutant using the suicide plasmid pCVD442 and the compensating Salmonella strain implemented with typhimurium spv gene, then perform drug resistance detection and detect the expression of resistance related genes by determination of MIC value, RT-PCR and western blotting.

Results

MIC data, RT-PCR and western blot analysis suggested that the down-regulation of spv can increase the sensivity of Salmonella typhimurium to antibiotics, which may due to the influence in the efflux pump AcrA.

Conclusions

The finding that the change of the spv expression can impact on the virulence of Salmonella typhimurium while conferring increased susceptibility to kinds of antibiotics could provide a basis for new treatment strategies for resistant bacteria.
Background: Flu is a significant epidemiological problem in Poland. Children are at a higher risk of a worse outcome.

Aim: To analyze the number of hospitalized influenza cases, clinical signs, symptoms, and course of the disease in a Warsaw pediatric department within a single epidemic season.

Material and methods: During the 2015/2016 influenza season 163 children (75 girls, 88 boys) aged 16 days-17 years (average 2 years 10 months) were hospitalized due to influenza. The diagnosis was confirmed with the rapid influenza diagnostic test (RIDT, 45 cases) and/or molecular diagnostics (RT-PCR, 118 cases).

Results: 56% of patients were referred to the hospital, while 16% required emergency intervention and/or transport. The remaining children were registered without referral. 71.2% (116/163) children had influenza A, 18.4% (30/163) influenza B, while 10.4% children (17/163) were diagnosed with A+B co-infection. Complications were observed in 55.8% cases (91/163), and 42.3% (69/163) of patients required antibiotic therapy. Hospitalization period ranged from 1 to 21 days (median 7 days) and was longer in children with complications (8 vs. 6 days, p<0.01).

Conclusion: Influenza is a frequent reason for hospitalization and the high frequency of complications extends the treatment period.

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GENETIC VARIABILITY IN VP4 AND VP7 GENES OF GROUP A HUMAN ROTAVIRUS OUTBREAK IN YUNNAN PROVINCE, CHINA

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Background and aims

Group A rotavirus (RVA) account for most of the severe dehydrating diarrhea in the children worldwide. RVA infections are associated with high morbidity and mortality, RVA has two outer capsid proteins, VP7 and VP4, which define the G and P genotypes, respectively.

Methods

In this study, out of 150 stool samples, 37 samples had rotavirus antigen detected by ELISA and verified by RT-PCR and followed by DNA sequencing. G9P [8] was the predominant type in Yunnan in 2015. To explore gene polymorphisms and intratypic variations of RVA VP4/VP7 genes originating in Yunnan, RVA (VP4: n = 17, VP7: n = 20) VP4/VP7 genes were sequenced and compared to others described and submitted to GenBank. Phylogenetic trees were then constructed by Neighbor-Joining and the Kimura 2-parameters methods (MEGA software).

Results

13 single nucleotide changes were observed in VP4 sequences with 12/17 non-synonymous mutations and 5/17 synonymous mutations. Meanwhile, 84 nucleotide changes were observed in VP7 sequences with 12/20 non-synonymous mutations and 8/20 synonymous mutations. The results indicated that the epidemic RVA strain of Yunnan in 2015 was most similar to the China strain from Zhejiang province in 2013 and the strain from Zhaotong of Yunnan in 2005, which showed that there was an internal recycling epidemic trend of RVA in China and the prevalent G-P combination of the rotavirus geno-typing was G9P [8] in Yunnan since 2005.

Conclusions

This study may help understand the intrinsic geographical relatedness and biological differences of RVA and contributes further to research on infectivity, pathogenicity and vaccine strategy.
ETIOLOGY OF PERTUSSIS AND PERTUSSIS-LIKE SYNDROME IN CHILDREN

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Background and aims

Pertussis and pertussis-like syndrome are highly infective causes of cough that cause significant morbidity and mortality. The aim of this study was: to describe the etiology of the pertussis and pertussis-like syndrome, not only as far as Bordetella genus is concerned but also regarding the causative role of other microorganisms.

Methods

Fifty-eight children suffering from pertussis-like cough were prospectively evaluated for Bordetella pertussis, other bacteria and viruses. Polymerase chain reaction for bacterial pathogens including B. pertussis and M. pneumoniae and viral (influenza A and B, parainfluenza [PIV] 1 to 3, respiratory syncytial, rhinovirus [RV], metapneumovirus, and adenovirus) and was applied to nasopharyngeal aspirate specimens. The clinical characteristics and laboratory findings were compared between patients with pertussis and pertussis-like syndrome.

Results

B. pertussis was detected from 28 (46.6%) patients with pertussis-like cough. As for other pathogens, RV was detected in 11 (19.0%) patients, PIV 3 in 3 (5.2%) patients and M. pneumoniae in 2 (3.4%) patients. Patients with pertussis had longer hospital stay compared with patients with pertussis-like syndrome (11 vs 9 days, p=0.02). White blood cell was higher in patients with pertussis compared with those with pertussis-like syndrome (27.5±17.5 vs 18.4±12.7×10⁹/L, P=0.02). However, there are no significant differences in terms of clinical symptoms.

Conclusions

B. pertussis was the predominant pathogen associated with pertussis-like cough, while investigation of other microorganisms is warranted, since clinical symptoms are commonly non-specific among infants.
HUMAN RHINOVIRUS COINFECTION WITH MYCOPLASMA PNEUMONIAE IN CHILDREN WITH PNEUMONIA
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Background and aims

To investigate the prevalence of human rhinovirus co-infection in children hospitalized with pneumonia. to determine if there is an association between co-infection and the clinical severity of pneumonia.

Methods

From January 2014 to December 2015, Eight hundred forty-six consecutive children hospitalized with pneumonia. were evaluated. Nasopharyngeal aspirates were tested for presence of hRV and 9 other respiratory viruses. Enzyme-linked immunosorbent assays were also performed to detect Mycoplasma pneumoniae.

Results

HRV was detected in 129 (15.2\%) samples, in 66 of them as the single agent and in 74 as coinfections, mostly with Mycoplasma pneumoniae (MP; 55.4\%). Wheezing was more frequently associated with children with hRV-MP coinfections, and the duration of wheezing was longer in children with hRV-MP coinfections than in those with single hRV infection. No significant difference in some parameters of disease severity, such as dyspnea, cyanosis, PICU admission and hospital day between single hRV infection and coinfections.

Conclusions

HRV was a common pathogen of pneumonia in children. hRV co-infection with MP is common, hRV-MP coinfections were associated with a higher likelihood of wheezing and longer duration of wheezing, but did not aggravate the severity.
ETIOLOGIC SPECTRUM AND OCCURRENCE OF COINFECTIONS IN CHILDREN HOSPITALIZED WITH COMMUNITY-ACQUIRED PNEUMONIA

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Background and aims

Co-infections are common in childhood community acquired pneumonia (CAP). However, their etiological pattern and clinical impact remains inconclusive.

Methods

Eight hundred forty-six consecutive children with CAP were evaluated prospectively for the presence of viral and bacterial pathogens. Nasopharyngeal aspirates were examined by direct immunofluorescence assay or polymerase chain reaction (PCR) for viruses. PCR of nasopharyngeal aspirates and enzyme-linked immunosorbent assays were performed to detect Mycoplasma pneumoniae (M. pneumoniae). Bacteria was detected in blood, bronchoalveolar lavage specimen, or pleural fluid by culture.

Results

Causative pathogen was identified in 70.1% (593 of 846) of the patients. The most commonly detected pathogens were respiratory syncytial virus (RSV) (22.9%), human rhinovirus (HRV) (22.1%), M. pneumoniae (15.8%). Coinfection was identified in 34.6% (293 of 846) of the patients. The majority of these (209 [71.3%] of 293) were mixed viral-bacterial infections. Age <6 months (odds ratio: 2.1; 95% confidence interval: 1.2–3.3) and admission of PICU (odds ratio: 12.5; 95% confidence interval: 1.6–97.4) were associated with mix infection. Patients with mix infection had a higher rate of PICU admission.

Conclusions

The high mix infection burden in childhood CAP underscores a need for the enhancement of sensitive, inexpensive, and rapid diagnostics to accurately identify pneumonia pathogens.
ETIOLOGIC SPECTRUM AND OCCURRENCE OF COINFECTIONS IN CHILDREN HOSPITALIZED WITH COMMUNITY-ACQUIRED PNEUMONIA

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¹Children's Hospital of Soochow University, Pulmonology, Suzhou, China

Background and aims

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Conclusions

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ANALYSIS OF THE CLINICAL CHARACTERISTICS OF MYCOPLASMA PNEUMONIAE PNEUMONIA AMONG CHILDREN OF DIFFERENT AGES

L. Jin-Song¹, Z. Li¹, G. Hai-Ying¹
¹Xili People’s Hospital of Guangdong Shenzhen, China

Objective: To investigate the clinical features, imaging and laboratory data changes of Mycoplasma pneumoniae pneumonia (MPP) among children of different ages.

Methods: Retrospective analysis was performed on the clinical data of 131 children who were confirmed with MMP between May 2016 and May 2017. Of all children with MPP were divided into 3 groups: 24 cases of infant group (1 month ~), 56 cases of preschool-aged children group (3 years old~) and 51 cases of school-aged children group(6 to 14 years old). The differences were compared in the clinical manifestation, pulmonary signs, chest radiography and laboratory examination of MPP among children of different ages.

Results: The infant group presented mainly with expectoration and wheezing, accompanied by low fever. They showed gastrointestinal symptoms as the most common extra-pulmonary manifestation and had evident pulmonary signs. The school-aged children group presented mainly with high fever and a severe dry cough, and wheezing was seen in several of them. They showed rash as the most common extra-pulmonary manifestation and had slight pulmonary signs. The clinical manifestations of the preschool-aged children group were in between. In the infant and preschool-aged children groups, most showed bronchopneumonia on chest Xray, while in the school-aged group, chest Xrays mostly showed segmental parenchymatous infiltration, easily caused by Pleurisy or atelectasis. The school-age group had a higher serum CRP、ESR than the infant group, while the infant group had a higher serum CKMB myocardial enzyme level than the school-aged children group.

Conclusions: The clinical features of MPP are different among children of different ages, especially even more obvious differences between infants and school-aged children.
STUDY ON THE CLINICAL CHARACTERISTICS OF MYCOPLASMA ENCEPHALITIS

Z. Jun¹, Z. Wei¹, L. Sheng-hua¹, P. Chu-wen¹
¹Second Clinical College of Jinan University Longhua Branch of Shenzhen People's Hospital

Objective
To investigate clinical features of different types of mycoplasma pneumonia (MP) encephalitis in children.

Methods
The clinical data collected from January 2012 ~ March 2017 in hospital 28 cases of Mycoplasma encephalitis cases, according to the clinical symptoms were divided into mild and severe mycoplasma encephalitis, nervous system symptoms according to the time divided into early onset and late onset of Mycoplasma encephalitis. encephalitis with clinical manifestations in children, the incidence of sequelae, the positive rate of MP-IgM and MP-DNA in cerebrospinal fluid (CSF) were retrospectively analyzed.

Result
The occurrence of severe mycoplasma encephalitis sequel rate reached 66.6%, the delayed was 41.7%, the mild 7.5%, early onset Mycoplasma encephalitis 12.5%, the difference between the rate of occurrence was statistically significant (P<0.05); 25% of early onset was severe mycoplasma encephalitis, and 87.5% of late-onset was severe mycoplasma encephalitis, there was statistically significant differences the rate of severe mycoplasma encephalitis (P<0.05); the positive rate of early encephalitis MP-IgM in CSF was 15.6%, the delayed for 33.3%, the light 15%,the heavy 37.5%, the positive rate of early encephalitis MP-IgM was significant difference Among various types of Mycoplasma pneumoniae encephalitis (P<0.05); the positive rate of early encephalitis MP-DNA in CSF is 31.3%,the delayed 25%,the light 32.5%,and the heavy 18.8%, there was significant difference between the positive rate of MP-DNA (P<0.05)

Conclusion
MP encephalitis is the most serious complication of MP pulmonary infection, delayed type mycoplasma encephalitis is more severe than the early onset, there were more sequelae in late onset and severe mycoplasma encephalitis. MP-IgM positive rate of late onset and severe mycoplasma encephalitis CSF is higher than the early onset and light type, contrarily, MP-DNA positive rate in CSF of early onset and mild Mycoplasma encephalitis higher, Combination of MP-IgM and MP-PCR examination in CSF is helpful for the clinical diagnosis of Mycoplasma encephalitis, delayed or severe mycoplasma encephalitis with MP-IgM positive in CSF have a higher incidence of sequelae.
AN INSIGHT INTO PEDIATRIC CANDIDEMIA: EXPERIENCE OF A PEDIATRIC TERTIARY CARE CENTER, NORTH INDIA
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¹Chacha Nehru Bal Chikitsalaya, Department of Clinical Microbiology and Infectious Diseases, Delhi, India

Background and aims

Candida species is the most common cause of invasive fungal infections in pediatric population and is a cause of high mortality and morbidity. Most studies of candidemia are focused on adult populations and risk factors identified in adults may not be relevant in children. The aim is to evaluate the demographic details, clinical presentations and laboratory parameters of bloodstream infections caused by Candida species in a tertiary care pediatric centre in North India.

Methods

Children under 12 years of age with Candidemia over a period of one year.
The risk factors, the clinical course in the hospital and the outcomes were assessed along with the susceptibility pattern of the Candida species causing infections.

Results

Total clinically suspected cases of fungal sepsis were 1447, out of which, culture proven cases with Candidemia – 62 cases. 47 (75.8%) of these were neonates.
Most common species isolated was *Candida tropicalis* (30.6%).

<table>
<thead>
<tr>
<th>Species</th>
<th>Fluconazole</th>
<th>Voriconazole</th>
<th>Amphotericin B</th>
<th>Caspofungin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td><em>C. albicans</em></td>
<td>2</td>
<td>12</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td><em>C. tropicalis</em></td>
<td>-</td>
<td>19</td>
<td>-</td>
<td>19</td>
</tr>
<tr>
<td><em>C. pelliculosa</em></td>
<td>2</td>
<td>11</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td><em>C. parapsilosis</em></td>
<td>-</td>
<td>7</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td><em>C. glabrata</em></td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td><em>C. krusei</em></td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><em>C. famata</em></td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><em>C. rugosa</em></td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><em>C. utilis</em></td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Antifungal susceptibility of *Candida* isolates

<table>
<thead>
<tr>
<th></th>
<th>CANDIDEMIA (other than neonates; n = 15)</th>
<th>NEONATAL CANDIDEMIA (n=47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEC</td>
<td>-</td>
<td>8 (17.0%)</td>
</tr>
<tr>
<td>DEVICE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Ventilation</td>
<td>11 (73.3%)</td>
<td>23 (48.9%)</td>
</tr>
<tr>
<td>b) Central line</td>
<td>4 (26.6 %)</td>
<td>3 (6.4%)</td>
</tr>
<tr>
<td>SURGICAL INTERVENTION (GI SURGERY)</td>
<td>6 (40%)</td>
<td>14 (29.8%)</td>
</tr>
<tr>
<td>PRIOR ANTIBIOTIC EXPOSURE</td>
<td>9 (60%)</td>
<td>31 (66%)</td>
</tr>
<tr>
<td>FLUCONAZOLE EXPOSURE</td>
<td>3 (20%)</td>
<td>3 (6.4%)</td>
</tr>
</tbody>
</table>

Table 2: Risk factors of candidemia cases

The mortality rate was 25.8% (16 patients), maximum in neonates (87.5%).

**Conclusions**
This study highlights the high incidence of candidemia in neonates, risk factors for candidemia and emergence of Non-Albicans Candida infections. More effective infection control and strict treatment protocols could be beneficial to patients with known risk factors.
ANTI-N-METHYL-D-ASPARTATE-ENCEPHALITIS – DIFFERENCES

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3University of Novi Sad- School of Medicine- Child and Youth Health Care Institute of Vojvodina, Department for Haematology and Oncology, Novi Sad, Serbia

Background and aims

Anti-N-methyl-D-aspartate (NMDA) receptor encephalitis symptoms including a highly characteristic set of neurologic and psychiatric manifestations, bring pediatricians into the course of care and misdiagnoses.

We present NMDAR encephalitis similarity and difference in 4 (CG) and 15 (AG) years aged females.

Methods

We present clinical and EEG videos, neuroradiology and immunocytochemistry findings.

Results

NMDA encephalitis was defined in third week of disease in CG, and from beginning in AG. Both have been previously healthy, and a febrile.

Psychotic symptoms were present in AG while irritability and behavioral outbursts, sleep dysfunction, hyperactivity, and hypersexuality were dominant in CG. Both present progressive alterations in consciousness and decline in speech and language, including perseveration, mumbling, starting in first three days of disease. Both had abnormal movements. CG had orofacial dyskinesias, dystonic posturing, and choreatic-like movements of both limbs, and AG predominantly one side tonic posturing and choreatic-like limb movements. Epileptic seizures have not been proved.

Both girls had slightly increased cerebrospinal fluid proteins and mild lymphocytic pleocytosis with positive oligoclonal bands only in CG. MRI shows hyperintensities in cortical and subcortical brain regions in both, present in CG lasting up to 3 months. EEG shows theta delta disorganizes activity with present lateralization in both.

Both recovered after immunosupresive (cortico) therapy, CG after 4.5 months and AG after 8 weeks recovered completely without relapses and sequel.

Conclusions

NMDA encephalitis, as a treatable autoimmune encephalitis with different clinical presentation in pediatric and adolescent age, has to be considered if any of symptoms is present.
Salmonella Typhimurium, a gram-negative facultative intracellular pathogen, induces autophagy during infection. The spv genes cluster, identified in some Salmonella enterica isolates, is consist of 6 open reading frames (ORF): spvA, spvB, spvC, spvD, spvE, and spvR. Here, we illustrated the role of spv gene on autophagy in Henle-407, a human intestinal epithelial cell. In our study, Salmonella STM.211, STM.211-ΔspvB and STM.211-ΔspvB.spvC were selected and co-cultured with Henle-407 cells. After incubation for some specific points in time, cells were collected for evaluation of LC3-II and p62 level by Western Blots. MDC staining of autophagic vacuoles was performed to explore the difference of autophagy level between each group. Our data showed that the amounts of LC3-II, an indicator of autophagy, was significantly higher in the STM211-ΔspvB infecting group and the STM211-ΔspvB.spvC infecting group compared to the STM211 infecting group (P<0.05). Furthermore, there was no statistically significant difference between the STM211-ΔspvB and the STM211-ΔspvB.spvC groups (P>0.05), and the opposite tendency was found in P62. This result was in concert with MDC staining. In conclusion, our findings demonstrated that the presence of spvB gene inhibits autophagy in Henle-407 cells, and that spvB and spvC do not have synergistic effect on autophagy in the intestinal epithelial cells.
DIFFERENTIAL DIAGNOSIS OF BACTERIAL CERVICAL LYMPHADENITIS AND KAWASAKI DISEASE IN PATIENTS WITH FEVER AND CERVICAL LYMPHADENOPATHY

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Background and aims

This study aimed to investigate the characteristics differentiating node-first presentation of Kawasaki disease (NFKD) from bacterial cervical lymphadenitis (BCL) and typical Kawasaki disease (KD).

Methods

The medical records of patients with BCL, NFKD, and typical KD were reviewed retrospectively. We analyzed and compared the demographic, clinical, laboratory, and imaging characteristics of the cohorts.

Results

Twenty-two patients with BCL, 37 with NFKD, and 132 with typical KD were included in this study. Patients with BCL had longer durations of hospitalization than patients with NFKD. Bilateral and multiple enlarged cervical lymph nodes were associated more with NFKD than BCL. Compared with BCL patients, NFKD patients had lower platelet counts, higher percentages of neutrophils, and higher C-reactive protein (CRP) levels. NFKD patients were older and presented with higher white blood cell counts, percentages of neutrophils, absolute neutrophil counts, and CRP levels as well as lower platelet counts and alanine aminotransferase levels than typical KD patients.

Conclusions

In febrile patients with cervical lymphadenopathy, the combination of bilateral and multiple enlarged nodes, low platelet count, high percentage of neutrophils, and high CRP levels should prompt consideration of NFKD for prevention of delayed diagnosis of KD.
EPIDEMIOLOGY OF ADENOVIRUS INFECTION IN CHILDREN HOSPITALIZED WITH LOWER RESPIRATORY TRACT INFECTIONS IN HUNAN, CHINA

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¹Hunan Provincial People’s Hospital, Pediatric, Changsha, China
²Disease Control and Prevention- China CDC, National Institute for Viral, Beijing, China

Background and aims

We conducted a molecular characterization of the circulating genotypes of human adenovirus (HAdV) from nasopharyngeal aspirates (NAs) of children hospitalized with acute lower respiratory tract infections (ALRTI) in Hunan (China), and determined the clinical features of different types.

Methods

A nested PCR and DNA sequencing assay of the HAdV hexon gene HVR1-6 is rapid and efficient compared with classical testing and was used for the present study.

Results

Among 4751 nasopharyngeal aspirates (NAs), a total of 447 (9.4%) specimens were HAdV-positive. HAdV types 1 to 7 (HAdV 1-7) were identified in 95.7 % of the NAs, and HAdV-7 and HAdV-3 were the most prevalent (34.9% and 33.6%). HAdV-3 and HAdV-7 had a significant seasonal distribution (P=0.001). Co-infection with other respiratory viruses was detected in 63.3% (283/447) of the HAdV-positive samples. Of these patients, 93.3% (417/447) were children younger than 5 years. No significant difference was found in clinical manifestations between patients who were infected with single HAdV-3 and HAdV-7. The hospital stay of patients infected with single HAdV-7 was significantly longer than single HAdV-3 infection (P=0.03). Mixed infection in younger children was associated with longer hospital stay (P=0.023).

Conclusions

HAdV is an prevalent virus for children hospitalized with ALRTIs in Hunan, China. HAdV-7 and HAdV-3 were the predominant HAdV types in children with ALRTI during the study period. HAdV-7 caused more severe ALRTI than the other types.
HUMAN ADENOVIRUS INFECTIONS IN HOSPITALIZED CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA: ASSOCIATION BETWEEN VIRAL LOAD, VIRUS SEROTYPE, AND DISEASE SEVERITY

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¹Hunan Provincial People’s Hospital, Pediatric, Changsha, China
²Disease Control and Prevention- China CDC, National Institute for Viral, Beijing, China

Background and aims

Background: The severity of adenovirus infection was associated with the serotype of adenovirus and the immune status of the hosts. Objective: To investigate the relationship between the viral load of adenovirus and severity of community-acquired pneumonia in pediatric patients.

Methods

Methods: 1313 samples of nasopharyngeal aspirates were obtained from pediatric patients with community-acquired pneumonia between April 1, 2011 and March 31, 2014. The quantitation of adenovirus was performed by quantitative real-time PCR, and the serotype of adenovirus was determined by nested-PCR. The severity of pneumonia was graded accordance to the WHO classification criteria.

Results

174/1313 patients (13.25%) were diagnosed as adenovirus infection positive. Serotype-7 was the major type of infection (76/174, 43.68%), followed by serotype-1 (26/174, 14.94%), serotype-2 (27/174, 15.51%), and serotype-3 (26/174, 14.94%). The severity of pneumonia was graded for 174 patients with adenovirus infection: mild grade (108 patients), moderate grade (33 patients), and severe grade (33 patients). The severity of pneumonia was positively associated with the virus load of adenovirus, the severer pneumonia, the higher virus load of adenovirus. The serotype-7 adenovirus, the most common type of the severe pneumonia, was higher than the other three serotypes. Among the patients with the same serotype adenovirus infected, it was also found that the severer pneumonia, the higher the virus load of adenovirus with statistical significance.

Conclusions

Conclusion: In the pediatric patients, the high virus load of adenovirus was associated with the severity of community-acquired pneumonia.
RECURRENT CHICKENPOX IN A BOY WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Background and aims

To describe a case of an immunocompromised boy with recurrent chickenpox, explore the etiology, and how to avoid it.

Methods

A case of recurrent chickenpox in a boy with acute lymphoblastic leukemia was identified retrospectively.

Results

In this report we describe a patient with acute lymphoblastic leukemia (ALL) who had severe clinical aspects of continuing high fever and recurrent eruption of cropping lesions during his first chickenpox. Seven weeks later this child had a mild recurrent varicella. We measured the serum levels of VZV DNA during the recurrent period. It was positive at the beginning, then negative on the end of therapy.

Conclusions

Recurrent chickenpox in immunocompromised patients in a short term may be associated with the inadequate antiviral treatment. Monitoring serum VZV DNA loads may be very important. We infer that it is time to end the treatment in immunocompromised patient or recurrent VZV infection when the VZV DNA in serum is undetected, which need further research.
VIRAL ETIOLOGY IN CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA
S. Ting
1Children’s Hospital of Soochow University, Pediatric Infection, Suzhou, China

Background and aims

Children with community-acquired pneumonia (CAP) in Soochow University Affiliated Children’s Hospital, account for 85% of the annual pediatric CAP cases in this region. Their data are very reliable for viral etiology in children with CAP in the Soochow area. We aimed to expand our understanding of the viral epidemiology in children with CAP in this area by comparing seasonal and clinical characteristics of respiratory viruses from patients at this hospital.

Methods

We collected 22,825 nasopharyngeal secretion samples from hospitalized children with CAP who were admitted from January 2010 to December 2014. We tested these samples for respiratory syncytial virus (RSV), influenza A and B (Inf-A and Inf-B), parainfluenza virus 1 to 3 (Pinf1–3), and adenovirus (ADV) by direct fluorescent antibody tests and for human bocavirus (HBoV) by real-time fluorescence quantitative polymerase chain reaction. The population profiles and respiratory pathogen histories of the CAP patients were retrospectively collected by chart review with a standard questionnaire.

Results

Of the 22,825 nasopharyngeal secretion samples, 6,314 (27.66%) had evidence of virus infection. Respiratory viruses cause CAP at a high rate in children under 1 year of age (66.7%). The peak rate of respiratory virus detection occurs in winter. RSV, HBoV and Pinf3 are the most common viral pathogens of CAP in children in Soochow area. The epidemic season of RSV was winter and autumn, that of HBoV was summer and autumn, and that of Pinf3 was summer.

Conclusions

In the Soochow area, a substantial proportion of childhood CAP is due to viruses. the predominant viral pathogens vary by season.
THE EFFICACY OF INTRAVENOUS ESMOLOL IN THE TREATMENT OF CHILDREN WITH HAND-FOOT-MOUTH DISEASE
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²Qilu Children’s Hospital of Shandong University, Pediatric Intensive Care Unit, Jinan, China

Background and aims

This study aimed to evaluate the efficacy and prognosis using esmolol in children of hand-foot-mouth disease (HFMD) with persistent high heart rate.

Methods

A total of 76 HFMD children with persistent high heart rate were included from March 2012 to August 2014 in pediatric intensive care unit (PICU) of our Hospital. The patients were randomly divided into conventional group and esmolol group (both n=38). Conventional group received reducing intracranial pressure, anti-viral therapy, immunoglobulin injection, sedatives and other treatment. Esmolol group received esmolol injection based on treatments of immunoglobulin. The differences between two groups were compared and analyzed in heart rate, length of ICU stay, utilization rate of ventilator and mortality.

Results

Our results showed that there were no statistically significant differences in gender, age and heart rate between the two groups (P>0.05). The days until cardiac function improvement (2.42±1.11 d) and length of ICU stay (12.53±8.15 d) were significant decreased in esmolol group compared with those of conventional group (days until cardiac function improvement: 3.45±1.058 d; length of ICU stay: 17.84±12.822 d) (P<0.05). There were significantly fewer cases which received mechanical ventilation in esmolol group (11 cases, 28.9%) compared with conventional group (22 cases, 57.9%) (P<0.05). There were three death cases in esmolol group (7.9%), which was reduced compared with the conventional group (9 cases died, 23.7%), with no statistically significant difference (P>0.05).

Conclusions

The results indicate that HFMD children with persistent high heart rate receive routine treatment plus esmolol can significantly improve cardiac function, prevent disease progression and improve prognosis.
EVALUATION OF BIAPENEM IN 50 PATIENTS WITH SEVERE BACTERIAL COMMUNITY ACQUIRED PNEUMONIA IN CHILDREN
L. li, Z.H. Qu
\(^{1}\)Affiliated Hospital of Qingdao University, Pediatrics, Qingdao, China

Background and aims

To evaluate clinical efficacy and safety of Biapenem in treating patients with severe bacterial community acquired pneumonia (CAP) in children.

Methods

Fifty patients with severe bacterial CAP were given Biapenem 10mg/kg, q12h intravenously for 7 days. Body temperature change was observed. Blood routine test (WBC), Serum C-reactive protein (CRP), procalcitonin (PCT), alanine aminotransferase (ALT), aspartate aminotransferase (AST), blood urea nitrogen (BUN), creatinine (Cr), arterial blood oxygen pressure (PaO\(_2\)) and oxygenation index (PaO\(_2\)/FiO\(_2\)) were compared before and after treatment. Sputum culture and chest CT were reviewed. Adverse reaction of Biapenem was evaluated.

Results

In the 50 patients with severe bacterial CAP, body temperature decreased significantly to normal within average (2.4±1.5) days. WBC count reduced significantly from (16.3 ±4.1)×10\(^9\)/L to (6.5±3.7)×10\(^9\)/L after treatment. Serum CRP level decreased significantly from (65.3±18.9)mg/L to (2.4±1.3)mg/L after treatment. PCT reduced significantly from (5.7±3.8)ng/mL to (0.017±0.008)ng/mL; PaO\(_2\) increased significantly from (77.2±11.9)mmHg to (91.5±13.5)mmHg after treatment. PaO\(_2\)/FiO\(_2\) increased significantly from (314.7±78.1) to (435.7±64.7). All the above comparisons showed statistical significance (P<0.01). No significant difference was observed on ALT, AST, BUN and Cr (P>0.05). Sputum pathogen clearance was 91.7%. The pulmonary inflammatory lesions on chest CT of 46 cases subsided apparently after treatment. No severe adverse reaction was observed in the 50 survivors of severe bacterial CAP.

Conclusions

Biapenem shows good therapeutic effect in patients with severe bacterial CAP in children.
Factors associated with fatal outcome of children with enterovirus A71 infection - A case series
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6Puning People’s Hospital of Southern Medical University, Pediatric Intensive Care Unit, Jieyang, China
7Riverland Nursery Ltd., Riverland Nursery Ltd., Auckland, New Zealand
8Guangzhou Women and Children’s Medical Center- Guangzhou Medical University, Pediatric Department, Guangzhou, China
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10Jinan University Medical College Affiliated Dongguan Hospital, Pediatric Intensive Care Unit, Guangzhou, China

Background and aims
Enterovirus A-71 (EV-A71) may be fatal, but mechanisms, symptoms, and signs are poorly understood.

To examine the natural history of fatal EV-A71 infection and to identify the symptoms and signs for early warning of deterioration.

Methods
This was a clinical observational study of fatal cases of EV-A71 infection treated at five hospitals (China) between January 1st, 2010 and December 31st, 2012. We recorded and analyzed 91 manifestations of EV-A71 infection in order to identify indicators for early assessment.

Results
Fifty-four fatal cases were included. Median age was 21.5 months (Q1-Q3: 12-36). The median duration from onset to death was 78.5 hours (range, 6 to 432). The multilayer perceptron analysis showed that ataxia respiratory, ultrahyperpyrexia, excessive tachycardia, refractory shock, pharyngeal reflex absence, irregular respiratory rhythm, hyperventilation, deep coma, pulmonary edema and/or hemorrhage, excessive hypertension, tachycardia, somnolence, CRT extension, fatigue or sleepiness, and age were associated with death. Autopsy findings (n=2) showed neuronal necrosis, softening, perivascular cuffing, colloid, and neuronophagia phenomenon in the brainstem.

Conclusions
The fatal cases of enterovirus A71 had neurologic involvement, even at the early stage. Direct virus invasion through neural pathway and subsequent brainstem damage might explain the rapid progress to death.
SERUM INFLAMMATORY CYTOKINE LEVELS CORRELATE WITH CD4 + T CELLS IN HAND-FOOT-MOUTH DISEASE

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To investigate the correlation between the expression of proinflammatory and anti-inflammatory cytokines associated with CD4+T cells and severity of disease and prognosis in severe hand, foot, and mouth disease to find out predict factors for further immunotherapy.
This study aimed to evaluate the associations of TIM-3, LAG-3, PD-1 and CTLA-4 polymorphisms with susceptibility to EV71 infections and disease progression of HFMD in pediatric patients.
Background and aims

CMV infection is one of the major causes of congenital defects, and may even cause life-threatening diseases, so it is very important to standardize the diagnosis and treatment of infant cytomegalovirus infection.

Methods

We collected and analyzed clinical data of patients who were diagnosed cytomegalovirus infection in our department from January 2007 to January 2017.

Results

75 hospitalized patients in our department were diagnosed as CMV infection (female 25), congenital infection in 3 cases (4%), perinatal infection in 44 cases (59%), acquired infection in 28 cases (37%). 44 patients with elevated liver enzymes (65%), 7 patients with blood system involvement (mainly manifested as thrombocytopenia), 7 patients with hearing impairment (9%) and 4 patients with CMV pneumonia 4 (5%). In 2012, Chinese pediatric society issued a diagnosis and prevention proposal for child cytomegalovirus disease, further standardize the diagnosis and treatment of child CMV infection. 48 cases of CMV infection before 2012 (28 cases with positive CMV-IgM or elevated virus copies, 58%), and 32 patients accepted Ganciclovir antiviral therapy (according to the 2012 proposal, 15 cases meet the indications for antiviral therapy, 47%). A total of 27 patients were diagnosed as CMV infection after 2012, Most of the children with Ganciclovir antiviral therapy had no viral replication at 2-4 weeks, and liver enzymes returned to normal at 1-4 weeks, some patients have a transient liver enzyme increase.

Conclusions

Diagnosis and treatment of CMV infection is more standardized in our department, and for patients who meet the indication of antiviral therapy, standardized anti-viral treatment can effectively shorten the course of disease, reduce organ involvement.
The Profile of Subdural Effusion and Platelet Counting in Childhood Bacterial Meningitis

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Background and aims

We investigated the clinical and peripheral blood test characteristics of childhood bacterial meningitis complicated with subdural effusion.

Methods

A retrospective cohort chart review was performed. Cases of bacterial meningitis were identified in Shenzhen Children’s Hospital from January 2009 to December 2013.

Results

Of the 162 cases, 88 had used antibiotics before admission. 49/162 (30.25%) were complicated with subdural effusion. Ages were consisting of 86% younger than one year, 71% was one to four months old. The median duration before admission was three days. 75.5% of them occurred in the first 10 days after onset of the meningitis, and the incidence was 48.84% in infancy younger than one year. Only 16 (33%) had the clinical features described in textbook about subdural effusion in bacterial meningitis. The WBC was less increased and CRP was higher in the subdural effusion group on the admission day (P < 0.05). If CRP 94.5 mg/L was set as cut off value to predict subdural effusion the sensitivity was 94.95% and specificity 81%. The PLT was high in the 93% patients.

Conclusions

Subdural effusion is common in infancy, and most occurred in the first 10 days of the meningitis. The extensively used CT and/or MRI scan may result in early and increased diagnosis of subdural effusion. On admission day the higher CRP, less increased WBC, or a second time raising might predict the occurrence of subdural effusion. The increased PLT may be a clinical feature of bacterial meningitis.
To explore the therapeutic effect of compound sulfamethoxazole on children with pertussis.

A retrospective study was adopted for the collection 12 cases of children with pertussis from March 2016 to March 2017 in Shenzhen Children's Hospital, who had been given oral sulfamethoxazole. The clinical data were analyzed.

In 12 cases, 9 males and 3 females. 7 cases were less than 3 months of age, 5 cases were more than and equal 3 months of age. In 12 cases, 9 cases were not vaccinated, 1 case was vaccinated partially and 2 cases were vaccinated completely. The number of PCR copies fluctuated between $5.12 \times 10^3$ - $1.08 \times 10^6$. All cases were given a full-course treatment of macrolide antibiotics before or after admission, All children with spasmodic cough given oral compound sulfamethoxazole were significantly relieved. 8 cases relieved within 3 days, 4 cases relieved within 4 days, all 12 cases relieved within 5 days. In the treatment of compound sulfamethoxazole for 3 days, 7 of 8 cases had the decreased number of PCR copies. At the end of the treatment, 9 of 10 cases had been negative for PCR. 11 cases had no adverse reactions, and 1 case had liver damage.

Although compound sulfamethoxazole is a second-line treatment for pertussis, it has a significant effect on the alleviation of spastic cough and the decrease in the number of copies of PCR. Clinical symptoms were not significantly alleviated with macrolide antibiotics for pertussis patients, compound sulfamethoxazole can be chosen, but the large sample data is further needed.
MUMPS MENINGOENCEPHALITIS IN CHILDREN WITHOUT PAROTITIS
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Objective To explore the morbidity and clinical characteristics of mumps meningoencephalitis in children without parotitis.

Methods Two hundred and twenty-three cerebrospinal fluid specimens were collected from children who were admitted to Department of Pediatrics, the Second Affiliated Hospital of Shantou University Medical College from June 2010 to February 2016. Multiplex PCR was applied to detect the mumps virus and other common viral (measles virus, enterovirus, enterovirus 71 type, coxsackie virus 16 type, dengue virus, Japanese encephalitis virus, rubella virus, herpes simplex virus, human cytomegalovirus, EB virus, Chikungunya virus and Charon evagatus) cause in viral encephalitis. The clinical data of patients with mumps virus infection were analyzed.

Results In 223 cerebrospinal fluid specimens, 11 cases (4.9%) had positive mumps virus detection, of whom, the mycobacterial, fungal, conventional CSF cultures and other common viral cause in viral encephalitis were negative. There was 1 case who appeared parotitis on the sixth day after admission. Of 11 cases with positive mumps virus, there were 10 cases without parotitis. The cardinal symptom of mumps meningoencephalitis in children without parotitis were fever, headache, vomit and seizure, the CSF parameters, brain MRI, EEG of the patients with mumps meningoencephalitis who without parotitis were all similar to other viral encephalitis, the prognosis was good in children with mumps meningoencephalitis without parotitis, but the cerebrospinal fluid returned to normal for a long time, the longest time was 4 weeks.

Conclusion Mumps meningoencephalitis may occur in children without parotitis, the most common symptom are fever, headache, vomit and seizure.
A RETROSPECTIVE STUDY OF FEVER-INDUCED REFRACTORY EPILEPTIC ENCEPHALOPATHY IN PREVIOUSLY HEALTHY SCHOOL-AGED CHILDREN

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Background and Aims: To describe the characteristics of fever-induced refractory epileptic encephalopathy (FIRES) in previously healthy school-age children.

Methods

This retrospective study included six previously healthy children with FIRES admitted to Shenzhen Children’s Hospital between March 2014 and March 2016.

Results

These children ranged in age from 5 years 6 months to 10 years 4 months. All children exhibited symptoms resembling viral encephalitis without evidence of infectious agents in the CSF. CSF pressure was normal or mildly elevated in the early phase, though dramatic elevation was observed in four cases after 1 month. Two seizure types were identified at onset: focal in five and myoclonic in one. Initial radiological findings for all children were normal; however, follow-up examination revealed three cases of bilateral hippocampal hypersignal and atrophy, two cases of mild generalized brain atrophy, and two of focal destructive lesions. All patients responded poorly to comprehensive therapies. SRSE resolved in 4 cases which had lasted from 18 to 65 days. Six-month mortality was 50%, while in-hospital mortality was 33%.

Conclusions

When FIRES occurs, aggressive and comprehensive therapies should be adopted to prevent further neuronal injuries. SE may last for months prior to resolution. Continuous anesthesia may be required in this situation and relates to better outcome. Patients exhibiting focal destructive lesions experience poorer outcomes than those with no focal destructive lesions.
The objective of this study was to determine the mechanism, clinical manifestations, treatment and outcomes of pericarditis associated with mycoplasma pneumoniae (MP) infection in children. We identified 15 patients suffered from pericarditis associated with MP infection from Feb. 2009 to Mar. 2017, accounting of 1.9% (15/785) of hospitalized children with MP infection at Children’s hospital Shenzhen. The mean age was 7.66 years (11 months to 12 years old). Nervous involvement was noted in 5 (33.3%) patients. An echocardiogram was carried out in all patients, in which 6 (40%) with mild, 6 (40%) with moderate and 3 (20%) with severe pericardial effusions, thus enabling pericardiocentesis in 7 patients. The MP IgM antibody was positive in all patients. The MP DNA was detected in serum of 13 (86.7%) patients, however the MP DNA was negative in all pericardial fluid by PCR technique. All patients were treated with adequate anti-MP therapy, in which 7 received pericardial puncture and drainage, their symptoms improved significantly without recurrent effusions. In summary, pericarditis was a rare extrapulmonary manifestation of mycoplasma pneumoniae infection in children. Neurological symptoms were common. Echocardiography and serum MP IgM antibodies can be helpful to make a correct diagnosis, the prognosis was good after appropriate treatment.
EARLY DIAGNOSIS INDEX OF REFRACTORY MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN

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Background and aims

To explore the clinical features of early identification of refractory mycoplasma pneumoniae pneumonia (RMPP) through the analysis of the associated factors between the common mycoplasma pneumonia (MPP) and RMPP.

Methods

A retrospective study was carried out to analyze the cases of MPP from September 2015 to January 2017. A total of 45 cases of children with RMPP were enrolled in observe group while 135 common MPP cases in control group. All the clinical and laboratory data of the patients were collected and SPSS 21.0 software was applied for data processing.

Results

There were 26 boys and 19 girls in observe group, mean age was 4.0 years, while 71 boys, and 64 girls in control group, mean age was 3.3 years. There was no significant difference in gender between two groups. However, the age difference was statistically significant. The patients in observe group had the longer thermal process, more extrapulmonary complications and merger cases of allergic disease (P < 0.05). LDH, D-dimer and ESR in observe group increased significantly and there were no difference of PCT and CRP between two groups. Multiariable Logistic regression analysis suggest that LDH, D-dimer, the later use of macrolide antibiotics were the independent risk factors for the development of RMPP (P < 0.001).

Conclusions

The older age, sustained fever, extrapulmonary complications, allergic constitution are thought to be high risk factors of the RMPP; Serum LDH, D-dimer and the later use of macrolide antibiotics are the independent factors of RMPP. High serum LDH and D-dimer maybe the early predictive laboratory indexes of RMPP.
To investigate the changes of hepatitis B virus (HBV) related immune markers in children after allogeneic hematopoietic stem cell transplantation (allo-HSCT).

70 children undergone allo-HSCT and their donors were reviewed retrospectively at the department of hematology and oncology, Shenzhen Children’s Hospital from Jan 2012 to Dec 2016. HBV-related immune markers including HBsAg, HBsAb, HBeAg, HBeAb and HBcAb were detected before and after allo-HSCT in both patients and donors.

All recipients were HBsAg negative (HBsAg-) before allo-HSCT, 53 cases were HBsAb+. The median follow-up time was 41 months (ranged from 6 to 66 months). Among 42 HBsAb+ recipients undergone allo-HSCT from HBsAb+ donors, 8 cases turned to HBsAb- after allo-HSCT, 34 cases remained HBsAb+. Among 11 HBsAb+ recipients undergone allo-HSCT from HBsAb- donors, 5 cases turned to HBsAb-. Moreover, Donors’ HBsAb positive rate and the higher recipients HBsAb titers before transplantation had significant effects on the negative conversion rates of HBsAb of the recipients after transplantation. No case of HBV reactivation was found in these study.

Anti-HBs antibodies were generated in HBsAb- recipients after allo-HSCT from HBsAb+ donors. Anti-HBs antibodies in recipients after transplantation lost gradually with the time passed by. There were obvious correlations among loss ratio of HBsAb, HBsAb titer, and HBsAb status of donors. Therefore, HBV vaccination for both recipients and donors before allo-HSCT and secondary vaccination after allo-HSCT are necessary for the patients to prevent HBV reactivation and infection.
EXPLORATION OF HIGH-THROUGHPUT SEQUENCING METHOD IN SEVERE PNEUMONIA PATHOGENS DETECTION
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Background and aims

To establish the pipeline and to evaluate the feasibility of high-throughput sequencing method used in the detection of severe pneumonia pathogens.

Methods

Bronchi alveolar lavage fluids (BALF) samples from 76 patients of severe pneumonia (treatment group) and 18 patients of tracheal malacia (control group) with no pathogen detected by clinical methods were collected during March 2015 to December 2016 in Shenzhen Children's Hospital. The pathogens in the samples were detected using clinical tests and high-throughput sequencing respectively. The results of high-throughput sequencing were confirmed by real-time quantitative PCR and the high-throughput sequencing method used in the detection of severe pneumonia pathogens was evaluated.

Results

In 76 cases of patients with severe pneumonia, the results of high-throughput sequencing in 66 cases of bronchoalveolar lavage fluid specimens were positive. The sensitivity was 86.84%, which was significantly higher than the total sensitivity of traditional clinical detection methods including bacterial culture, immunofluorescence and quantitative PCR (68.42%, 52/76) (χ²=7.426, P<0.001). A total of 13 pathogens were detected in 66 positive samples of high-throughput sequencing, including Mycoplasma pneumoniae, Streptococcus pneumoniae, Haemophilus influenzae and adenovirus, etc. Nine kinds of pathogens were detected in these samples through non-high-throughput sequencing. Comparison of clinical test and high-throughput sequencing results in 76 samples in the experimental group, the results of 61 samples (80.26%) were entirely consistent and 15 samples (19.74%) specimens were not completely consistent.

Conclusions

The method for the detection of severe pneumonia pathogens based on high-throughput sequencing is highly sensitive and can detect unknown pathogens, which is superior to those used in traditional clinical detection.
THE SUSCEPTIBILITY TO ANTIBIOTIC AND GENOTYPES OF BORDETELLA PERTUSSIS STRAINS OF NEONATES

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Background and aims

To characterize the susceptibility to common antibacterial drugs and genotype of pertussis strains in neonatal infection.

Methods

A total of 36 B. pertussis isolates in neonatal infection were collected from Beijing children's hospital and Shenzhen children's hospital (29 and 7, respectively) during May 2013-July 2016. All of the isolates were tested for twenty drugs sensitivity and typed by major virulence-related antigens genes, what's more, amplified and sequenced the 23S rRNA gene.

Results

The MIC90 of all 36 isolates to amoxicillin, amoxicillin/clavulanate, ampicillin, levofloxacin, ceftriaxone, sulphamethoxazole/trimethoprim and meropenem were smaller than 0.5μg/ml, whereas 72.2% of the strains were resistant to erythromycin and azithromycin. Genotyping results can be divided into 4 types, the dominant virulence type was ptxA1/ptxC1/ptxP1/prn1/fim2-1/fim3-1/tcfA2. Nine (25%) ptxP3 strains, which were reported more virulent, were detected and every strains were susceptible to macrolides. All erythromycin-resistant strains were found to have the A2047G mutation by sequencing.

Conclusions

The situation of macrolides resistance in neonates is very serious, then sulfonamides, quinolones and beta-lactam antibiotics can be considered for the treatment. The main epidemic genotype of pertussis is generally consistent with vaccine strains except ptxA, and the proportion of ptxP3 in newborns is high compared with it in the entire age of children.
A NOVEL METHOD FOR THE ADMINISTRATION OF AMPHOTERICIN B FOR CHILDHOOD ACUTE LEUKEMIA WITH INVASIVE FUNGAL DISEASE
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Background and aims

Invasive fungal disease (IFD) is a frequently lethal complication, especially among children with acute leukemia, that requires early decision making and the timely initiation of major treatment strategies. So novel treatment strategies for individuals with severe immunosuppression caused by chemotherapy are sorely needed. We therefore assessed the efficacy and safety of rapid dose escalation treatments compared with standard treatment with amphotericin B (AMB) in our hospital.

Methods

This study was conducted as an open-label, prospective, controlled clinical trial to compare two strategies for use of empirical antifungal therapy in a total of 108 patients. Those assigned to Group A (n=50) received standard treatment, which was a series of 0.1, 0.2, 0.3, 0.4, 0.5, then 0.7 mg/kg AMB per day for 6 days. Group B (n=58) received injections of 0.2, 0.4, then 0.7 mg/kg AMB each day for 3 days. The two groups were compared with regard to the efficacy, safety and tolerability of administration of AMB. Clinical assessments were performed 4 wk after treatment ended. The primary endpoints were overall success rate (complete or partial response) and the rate of adverse events (AEs).

Results

Overall success rate differed significantly between patients treated for 3 days and those treated for 6 days (70.0% vs. 87.9%, P=0.039). The incidence of AEs was similar in both groups.

Conclusions

Three-day rapid dose escalation can effectively treat IFD and is well tolerated by the patient. This regimen represents a suitable alternative for pediatric patients with acute leukemia receiving myelosuppressive systemic cancer chemotherapy.
THREE CASES OF EBV RELATED HYDROA VACCINIFORME-LIKE LYMPHOPROLIFERATIVE DISORDER(HV-LPD) IN CHILDREN
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Background and aims

To present clinicopathological features of 3 Chinese children with hydroa vacciniforme-like lymphoproliferative disorder with a mean duration of disease at the time of consultation was 3.2 years (1.8-4 years).

Methods

In this study, we describe the distinct features of three cases of hydroa vacciniforme-like lymphoproliferative disorder of childhood in China.

Results

All patients presented with skin lesions involving sun-covered or exposed areas. Intermittent fever, lymphadenopathy and hepatosplenomegaly were often observed. Case one presented with a dermatosis characterized by vesicles, erythema, crusts, and vacciniforme scars involving mainly the face and ear lobes. Facial edema was a prominent feature. Case 2 presented with papulovesicles mainly on her face. And the patient of case 3 presented with a dermatosis characterized by ulcerations, crusts and disfiguring scars on his face and limbs. All biopsies showed similar histological findings, characterized by a lymphoid infiltrate predominantly in the dermis. The atypia of the lymphocytes varied from case to case. The main immunohistochemical findings of case 2 and 3 were positive for CD8. Case 1 was few scattered positive for CD56.

Conclusions

HV-LPD is an EBV-associated lymphoproliferative disorder with a broad clinical spectrum.
ONE CASE OF FUNGAL PNEUMONIA CAUSED BY AIRWAY INHALATION

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Through the treatment of emergency bronchoalveolar lavage using the electronic bronchoscopy, a child with acute lymphoblastic leukemia complicated with severe pneumonia was quickly diagnosed as fungal infection caused by airway inhalation, which could provide new ideas for clinical rescue and treatment.
NASOPHARYNGEAL COLONIZATION IN PAEDIATRIC PATIENTS PRESENTING WITH FEVER IN THE ERA OF CONJUGATE PNEUMOCOCCAL VACCINATION

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Background and aims

We aimed to characterize bacterial colonization of hospitalized children with potential pathogens in relation to the introduction of conjugate vaccination.

Methods

Nasopharyngeal aspirates collected from children with fever and/or respiratory symptoms being admitted to the pediatric units at the Prince of Wales Hospital, Hong Kong were cultured and the isolates were characterized using routine methods. Data were categorized into five annums according to the date of admission; 1st April to 31st March in 2005/06 and 1st October to 30th September for 2009/10, 2010/11, 2011/12 and 2012/13.

Results

The percentage isolation for Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis were 13.0%, 10.7% and 24.7% among the 14,986 samples tested. S. pneumoniae and H. influenzae co-occurrence was negatively associated while M. catarrhalis and S. pneumoniae co-occurrence was positively associated.

When compared to the isolation amongst patients with febrile non-respiratory diseases, the isolation rates for S. pneumoniae were significantly higher among patients with upper respiratory tract infections (URTIs) (OR 1.55, 95% C.I. 1.36–1.76), AOM (OR 11.92, 95% C.I 7.57–18.76), pneumonia (OR 2.03, 95% C.I 1.74–2.37), bronchiolitis (OR 1.23, 95% C.I 1.03–1.47), and influenza (OR 1.34, 95% C.I 1.11–1.64).

The rate of S. pneumoniae colonization showed significant reductions in patients with febrile non-respiratory diseases, URTI, and asthma/allergic rhinitis, whereas no significant trends were observed among the patients with pneumonia, bronchiolitis and influenza.

Conclusions

The equilibrium of the nasopharyngeal niche is undergoing dynamic changes in the post-conjugate vaccination period and warrants continuous monitoring.
STAPHYLOCOCCAL SCALDED SKIN SYNDROME FROM 2006 TO 2015: MOLECULAR CHARACTERIZATION OF COMMUNITY ASSOCIATED METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS

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Background and aims

We investigated the clinical features and the epidemiology of Staphylococcal scalded skin syndrome from 2006 to 2015 in changwon. We also studied the molecular characteristics of methicillin resistant staphylococcus aureus(MRSA) isolates from staphylococcal scalded skin syndrome patients between 2013 to 2015, and the clonal relatedness of MRSA isolates from 4S patients between 2003 to 2005 and 2013 to 2015.

Methods

We reviewed medical records of 69 patients diagnosed with staphylococcal scalded skin syndrome from January 2006 to December 2015. MRSA was phenotypically identified by oxacillin susceptibility test and confirmed by PCR amplification of the mecA gene. Multilocus sequence typing (MLST), SCCmec typing, and pulsed-field gel electrophoresis (PFGE) were performed to analyze the molecular epidemiology of isolates.

Results

The mean age of patients was 2.6 years. By clinical type, 3 patients were in the generalized type (4.3%), 53 patients in the intermediate type (78.3%), and 13 patients were in the abortive type (18.9%). All of 23 S. aureus isolates obtained from 4S patients during 2013 to 2015 were ST89-SCCmec Iib/etb-positive-pvl-negative CA-MRSA. PFGE analysis showed that 31 CA-MRSA isolates, 22 from 2013 to 2015 and 9 from 2003 to 2005, belonged to the same pulsotype, but one isolate was of a different pulsotype.

Conclusions

4S caused by ST89-SCCmec Iib/etb-positive-pvl-negative CA-MRSA has been occurred in the Changwon area. Therefore, we will investigate further clinical, molecular epidemiology, and will try to find out appropriate tool for controlling this disease.
Background and aims

There are few related researches on the acute fever without a source (AFWS) of children in China. The aim of this study was to assess the etiology and the common test parameters of AFWS in the children under 3 months of age.

Methods

Cases were analyzed retrospectively and classified into different groups according to the age, the final diagnosis, and the guideline classifies of the risk of serious bacterial infection (SBI). The clinical information was collected.

Results

A total of 271 children were included. We found 30.6% of cases were urinary tract infection, 20.3% were lower respiratory infection, 20.7% were sepsis, and 17.0% were upper respiratory infection. 19 cases had irritability, 30 children had lethargy. 29.9% were at low risk of SBI while 29.6% of them were pneumonia, 17.3% were sepsis, 6.7% were untypical Kawasaki disease, and 3.7% were meningitis. Of the 101 children under 28 days of age, 35 cases were lower respiratory tract infection, which were more than the cases in the >60 days of age group (p<0.00). The differences of white blood count (WBC), C-reactive protein (CRP), and procalcitonin (PCT) among the upper and lower respiratory tract infection and the urinary tract infection groups were statistically significant (p<0.01).

Conclusions

The etiology of AFWS children under 3 months of age is different by ages. The urinary tract infection is commonest cause presenting with high level of WBC, CRP, and PCT. The criteria of SBI in assessing the infants under 3 months might misdiagnose some serious bacterial infection diseases.
THE DIAGNOSTIC CHALLENGE OF A CERVICAL MASS IN PEDIATRIC AGE

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Background and aims

Most acquired cases of cervical lymphadenopathy have an infectious or reactive origin, but malignancy must be considered. An asymptomatic lesion that appears to be an enlarged lymph node creates a difficult dilemma for the physician.

Methods

Case Report

Results

A 4-years-old male from Guinea-Bissau, with a three years’ history of an asymptomatic bilateral cervical mass. No preceding illnesses, fever or constitutional symptoms were recorded. Besides bulky, bilateral cervical, physical exam was otherwise normal. Ultrasonography showed an extensive, lobulated, solid, heterogeneous cervical mass that involved cervical structures without invading them. X-ray and abdominal ultrasonography were normal. Cytomegalovirus, HIV, atypical \textit{Mycobacteria and} tuberculosis, toxoplasmosis and bartonellosis were excluded. VCA-IgG and EBNA antibodies for \textit{Epstein-Barr virus} (EBV) were positive and VCA-IgM were negative. Lymph node biopsy demonstrated diffuse proliferation of dendritic histiocytic cells with eosinophilic cytoplasm and irregular elongated nuclei, which were immunoreactive for CD1a and S100 protein, establishing the diagnosis of Langerhans cell histiocytosis (LCH). Also, DNA EBV was detected in biopsy by polymerase chain reaction.

Conclusions

LCH is a rare disease characterized by a clonal proliferation of histiocytes. It affects mostly children younger than five-years-old. Cervical mass with lymph node involvement in a primary and isolated form, without cutaneous or bone involvement is extremely rare. The pathogenesis of LCH remains unclear. The etiologic association of human herpes viruses was suggested in many reports and remains debated. In our case, the presence of EBV DNA in the lymph node suggest a viral contribution to LCH pathophysiology.
A COMPARATIVE STUDY OF BLOOD STREAM INFECTIONS IN PEDIATRIC ONCOLOGY AND GENERAL PEDIATRIC PATIENTS
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Background and aims

Blood stream infections are a major cause of morbidity and mortality in children. Information on bacteriological profile and antibiotic susceptibility is required to start broad spectrum antibiotics. This study was done compare the bacteriological profile of blood stream infections in children on cancer chemotherapy with immune-competent children.

Methods

Blood cultures from pediatric Oncology (PO) and General Pediatric (GP) patients from January-December 2015 were analyzed along with the clinical outcome.

Results

762 and 1051 blood cultures were done in PO and GP during this period and 10% were positive for blood stream infection. In PO, NFGNB, Pseudomonas and E.coli contributed to 80% of the gram-negative isolates. In GP, NFGNB and S.typhi comprised 76% of the gram-negative isolates. The gram-positive isolates in PO were 77% CONS while in GP, 64% were S.pneumoniae. All E.coli were ESBL. In PO, 67% Klebsiella and 54% NFGNB were ESBL. In GP, all Klebsiella and 49% NFGNB were ESBL. CRO was seen in 46% NFGNB in PO. In GP, 27% NFGNB and 17% E.coli were CRO. Two of nine S.aureas were MRSA, and 2 of 4 enterococci were VRE, distributed equally between the groups.

In both groups, 79% of septicaemia deaths were due to gram-negative organisms with 43% due to E.coli in PO and 43% due to NFGNB in GP.

Conclusions

Spectrum of organisms and antibiotic resistance seen in immunocompromised and immunocompetent children were similar. This suggests need for judicial use of antibiotics in the community.
Background: Invasive candidiasis is a severe and sometimes life-threatening fungal infection. It comprises both candidemia and deep-seated tissue candidiasis, characterized by hematogenous dissemination or direct inoculation of candida species to a sterile site. The disease mainly affects patients with known immunosuppression, but it may also present in those with primary immunodeficiency arising from unknown genetic defects. Invasive candidiasis of the CNS is rare, but an elevated incidence in CARD9-deficient patients has been observed, possibly because of impaired neutrophil recruitment to the site of infection due to the lack of chemoattractants.

Methods: We studied the clinical features and imaging findings of invasive candidiasis (CNS, vertebral spine and knee joint) in an 11-year-old boy with no known immunodeficiency. In search for a cause of the susceptibility, gene sequencing of 6110 genetic diseases was performed.

Results: The patient presented with multiple bone destructions, recurrent fever, irritability and blurred vision. Biopsy and exudate culture confirmed the growth of Candida albicans. MRA scan of the brain showed cerebral vasculitis, which is rare in the case of CNS infections. Anti-fungal treatment was effective. The genetic results showed an inherited compound heterozygous CARD9 mutation (c.246C>A and c.1497delT) that has never been reported before. Both mutations were predicted to be
Conclusions: Invasive candidiasis in patients without known immunosuppression merit evaluation for CARD9 deficiency. Patients with CARD9-associated Candida infections require thorough testing, including CSF analysis.
AGGLOMERATION MANAGEMENT OF HOSPITAL INFECTION OF PICU MULTIDRUG-RESISTANT ORGANISM

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**Objective** To study the effect of cluster prevention and control measures on the incidence of nosocomial infection in multidrug-resistant bacteria.
CEREBROSPINAL FLUID LACTATE LEVEL AS A DIAGNOSTIC BIOMARKER FOR ACUTE BACTERIAL MENINGITIS IN CHILDREN

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Background and aims

Acute bacterial meningitis is one of the most common infections in Pediatric population. The diagnosis is based on cerebrospinal fluid (CSF) findings, but in some forms of aseptic meningitis, there can be significant overlap of CSF parameters with acute bacterial meningitis. CSF culture is gold standard, but it may not be cost and time effective in resource limited settings. CSF lactate enzyme may be helpful in diagnosis of acute bacterial meningitis. The objective of this study was to determine the sensitivity of CSF lactate level as diagnostic biomarker of acute bacterial meningitis in children.

Methods

This cross sectional study was conducted in the Division of Paediatric Infectious Diseases, Department of Paediatrics, King Edward Medical University/Mayo Hospital, Lahore from January to June 2017 (ongoing with expected total sample size of 400). Total of 97 patients of suspected acute bacterial meningitis of age 2months-12 years were included. Demographic and clinical data was obtained. Each child was subjected to lumbar puncture and was analyzed for CSF cytology, biochemistry and microbiology, and CSF lactate level. Each child was treated according to the individual merit. Data were analyzed through SPSS 20.0. Taking CSF culture as gold standard, diagnostic accuracy (sensitivity, specificity, positive and negative predictive value) was determined by entering the data in contingency table.

Results

Mean age of children was 5.9±1.39 years. The sensitivity, specificity, positive and negative predictive values of CSF lactate at ≥3.0 mmol/l for acute bacterial meningitis were 88%, 97%, 90% and 95% respectively.

Conclusions

CSF lactate at ≥3.0 mmol/l is a sensitive biomarker for acute bacterial meningitis in children of age 2months-12 years.
ECONOMIC BURDEN OF PNEUMOCOCCAL INFECTIONS IN CHILDREN UNDER 5 YEARS OF AGE

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Background and aims

The present study aimed to determine the cost of childhood pneumococcal infections under 5 years of age and to provide further data for future health economy studies.

Methods

Electronic medical records of children diagnosed with meningitis caused by S. pneumoniae and all-cause pneumonia, and acute otitis media (AOM) between January 2013-April 2014 were retrospectively evaluated. Direct costs for the treatments of hospitalized patients (pneumonia and pneumococcal meningitis) including costs of healthcare services consisted of costs of hospital bed, examination, laboratory analyses, scanning methods, consultation, vascular access procedures, and infusion and intravenous treatments. Direct costs for patients (AOM) treated in outpatient setting included constant price paid for the examination and cost of prescribed antibiotics. Indirect costs included cost of work loss of parents and their transportation expenses.

Results

Data of 131 children with pneumococcal meningitis (n=10), pneumonia (n=53), and AOM (n=68) were analyzed. The total median cost was €4,080.58 (direct cost: €3,346.38 and indirect cost: €851.97) for meningitis, €838.84 (direct cost: €480.66 and indirect cost: €335.89) for pneumonia, and €114.49 (direct cost: €17.59 and indirect cost: €96.91) for AOM. The medication cost (p=0.047), indirect cost (p=0.032), and total cost (p=0.011) were significantly higher in pneumonia patients aged ≥36 months than those aged <36 months; however, direct and total costs of AOM were significantly higher in the patients aged <36 months.

Conclusions

Results of the present study revealed that the treatment cost was significantly enhanced for hospitalization and for advanced disease. Thus, preventive actions, mainly vaccination, should be conducted regularly.
BACKGROUND: Fever and neutropenia in cancer patients are considered a medical emergency requiring prompt initiation of broad-spectrum antibiotics. This study aims to determine the treatment outcome of different empiric antibiotic regimen among pediatric ALL patients with fever and neutropenia admitted in Philippine Children's Medical Center.

METHODS: This is a retrospective cohort study. The medical records of ALL patients admitted in this institution from July 1, 2010 to June 30, 2015 were reviewed. Demographic data, clinical profile, management and outcome were noted. Data analysis was done using Stata SE version 13. Quantitative variables were compared using Analysis of Variance. Qualitative variables were compared using Fisher’s exact test. The level of significance is set at 5%.
RESULTS: A total of 263 charts were reviewed. Of these, 132 were males and 131 were females with a mean age of 6.4 years. There was no significant difference in the four treatment regimen. However, the success rate was higher among those given ceftazidime ± aminoglycoside (78.01%), piperacillin-tazobactam ± aminoglycoside (76.27%) and meropenem (77.78%), while 50.00% treatment failure was noted in the cefepime group.

CONCLUSION: The antibiotic regimen using ceftazidime±aminoglycoside or piperacillin-tazobactam±aminoglycoside proved to be as effective as using meropenem alone as the empiric therapy for pediatric ALL patients with fever and neutropenia.
INTRODUCTION: Paracoccidioidomycosis is a systemic mycosis which is endemic in Latin America. Two different presentations are reported - the acute or juvenile type and the chronic disease. The acute form occurs in children and adults under 30 years of age and comprises 10% of the infections. It is a severe disease whose symptoms manifest within weeks after the infection, and is associated with high mortality due to the hypertrophy of the reticuloendothelial system.

OBJECTIVES: We report the case of a 4-year-old boy living in an urban area of Jundiaí, São Paulo, Brazil, and a non-endemic area of the disease. He presented with a history of fever (38-39°C) for 2 weeks with no apparent source, lethargy and weight loss. On physical examination, he was febrile, pale and emaciated, with reduced air entry and crepitus in the right hemithorax. There was no peripheral lymphadenopathy or hepatosplenomegaly. Laboratory tests showed Hb 8.8mg/dL, 23600 white cells (most neutrophils), normal platelets, HSV 37mm/h, DHL 834 U/l. The chest x-ray showed opacities on the right middle lobe and enlarged mediastinum. Thorax CT revealed a right hilar mass (4.8x3.4cm) with hilar, paratracheal and paraoesophageal lymph nodes forming conglomerates, with dimensions from 3.1 to 5.1 cm. Immunodifusion and contraimmunoelectrophoresis (1/256) tests resulted positive for Paracoccidioides brasiliensis. He was treated with itraconazole 6mg/kg/day for 2 weeks with no significant response and the treatment switched to amphotericin B, 1mg/kg/d, which was used in a total of 14 days.

CONCLUSIONS: We report a case of severe acute paracoccidioidomycosis in a young child, unresponsive to the first line treatment with itraconazole, but showing a good response to amphotericin B.
LOW FREQUENCIES, WEAK MCP-1 SECRETION AND EXHAUSTED IMMUNE STATUS OF PERIPHERAL MONOCYTES ASSOCIATE WITH SEVERE PROGRESSION OF ENTEROVIRUS 71-INFECTED HAND, FOOT, AND MOUTH DISEASE

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Background: A minority of Enterovirus 71 (EV71)-infected hand, foot, and mouth disease (HFMD) could result in severe neural complications. It is supposed that host's intrinsic innate immunity would be associated with different (mild or severe) progress of the disease. However, the underlying immune mechanism remains unclear.

Methods: In this study, we recruited 223 EV71-infected children (120 with mild HFMD and 103 with severe HFMD) from Anhui Provincial Children’s hospital from July 2013 to September 2014.

Results: Peripheral monocytes were lower in both absolute counts ($P=0.028$) and frequencies ($P=0.006$) in severe HFMD cases than in mild cases. Ten monocyte-related cytokines in sera were detected in all EV71-infected patients, among which only the level of monocyte chemoattractant protein-1 (MCP-1) was found higher in mild cases than in severe cases ($P=0.016$). In vitro analysis indicated that MCP-1 concentration were significantly higher in culture supernatant of monocytes purified from mild cases than from severe patients, when stimulated by GM-CSF alone ($P=0.012$) or combined with LPS ($P=0.012$), R848 ($P=0.032$) and EV71 virus ($P=0.016$) respectively. Finally, phenotypic analysis showed that immune activation indicators HLA-DR ($P<0.001$) and CD38 ($P=0.002$) were down-regulated in monocytes from severe cases than from mild HFMD individuals, while immune exhaustion markers PD-1 ($P=0.005$) and PD-L1 ($P=0.027$) exhibited an opposite trend.

Conclusions: Our results suggested that the absolute count, frequency, MCP-1 secretion and immune status of monocytes may contribute to differentiated prognosis of EV71-infected HFMD. These findings would provide new insights into the mechanism of severe HFMD development.
Background and aims

Secondary Hemophagocytic lymphohistiocytosis (HLH) may be due to infectious, autoimmune or tumoral diseases. The most consistent association with infections is related to virus but bacterial, fungal, and parasitic infections have also been reported in association with HLH.

Methods

Descriptive case study.

Results

A previously healthy 17-year-old male, just arrived from Angola, complains of high-grade fever, malaise, myalgia and lumbar pain. On day-1 he started treatment with antimalarics. He had been immunized with yellow fever vaccine two months earlier. Physical examination showed fever, hepatomegaly and jaundice. Laboratory results: anemia (9.0mg/L) thrombocytopenia (45000/mm³), abnormal liver enzymes (ALT 298 UI/L) and clotting tests (TP 20.4/11.6s, aPTT 33.2/29s), hyperbilirurinemia (5.18mg/dl), markedly hyperferritinaemia (76879ug/L), hypertriglyceridemia (454mg/dl), increased soluble CD25 (6658pg/ml). Hepatitis A, B, C, Parvovirus B19 and HIV serologies and blood cultures were negative. Two blood smears were negative for Plasmodium species. Serology was IgG positive (IgM negative) for EBV, CMV, Dengue Chikungunya, Yellow fever and Zika. Bone marrow aspirate didn’t reveal hemophagocytosis. Clinical and laboratory results improved progressively, without any specific treatment. The patient was discharged and followed-up in the out-patient clinic without any further complain.

Conclusions

Our patient fulfilled the diagnostic criteria for HLH. The positive viral serologies may have been caused by a cross reaction with yellow fever vaccine. As the patient was already on antimalarics the diagnosis of malaria was not confirmed but a presumptive diagnosis was made. A benign course without treatment may be observed in an infection-related HLH, once the infection is cured, as occurred in our case.
STUDY ON THE CORRELATION BETWEEN SERUM 25- (OH) D3 LEVEL AND THE SEVERITY AND IMMUNE FUNCTION OF COMMUNITY-ACQUIRED PNEUMONIA IN CHILDREN

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Background and aims

To investigate the serum levels of 25- (OH) D3, humoral immunity and cellular immunity in children with different severity pneumonia, and to explore the correlation between serum 25- (OH) D3 level and the severity and immune function of community-acquired pneumonia in children.

Methods

A total of 175 patients with community-acquired pneumonia were enrolled in the Children’s Hospital affiliated to Capital Pediatric Institute in March 2001 to March 2017. They were divided into three groups. The levels of serum 25- (OH) D3 in serum were measured and the levels of white blood cell count, neutrophil and lymphocyte ratio, CRP, PCT, humoral immunity (IgA, IgG, IgM), cellular immunity (CD4, CD8, CD19, CD16/56), and to analyze the correlation between serum 25- (OH) D3 level and inflammatory cells and immune function.

Results

There were significant differences in the levels of serum 25- (OH) D3 between the three groups (F = 76.95, P <0.05). The results showed that serum 25- (OH) D3 level was negatively correlated with total white blood cell count, CRP and PCT (respectively, -0.307, -0.175, -0.163, P <0.05), but positively correlated with IgG (r = 0.181, P (OH) D3 and IgG levels were the risk factors of severe community-acquired pneumonia in children.

Conclusions

Serum 25- (OH) D3 and IgG levels are associated with community-acquired pneumonia in children. The levels of serum 25- (OH) D3 and IgG in children with severe pneumonia were significantly lower than those in mild pneumonia group.
A FEASIBLE WAY TO CONTROL INFECTION BY HEMATOPOIETIC STEM CELL TRANSPLANTATION FOR CHILDREN WITH APLASTIC ANEMIA AND REFRACTORY ACTIVE INFECTIONS

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Background and aims

It is generally recognized that allogeneic hematopoietic stem cell transplantation (allo-HSCT) should not be administrated to patients with severe aplastic anemia (SAA) or very severe aplastic anemia (VSAA), when they got active infection. However, without neutrophil, severe infection is usually difficult to control and even fatal. Under these circumstances, rapid recovery of neutrophil by allo-HSCT might be an alternative to control infection.

Methods

From January 2002 to December 2015, there were 175 patients received allo-HSCT for aplastic anemia at Shanghai Children's Medical Center in China. Among them, 22 patients received allo-HSCT with refractory active infections. Before allo-HSCT, 4 patients had persistent fever of unknown origin, 11 patients with single-site infection, and 7 patients with multiple-site infections. Sites of infection included lung, sinus, cellular tissue, peritoneum, liver, spleen and skin. The conditioning regimen consisted of fludarabine, cyclophosphamide and rabbit-antithymocyte globulin with or without total body irradiation (TBI) (2-3Gy).

Results

18 patients achieved recovery of neutrophil and finally control of infections, including 1 patient who suffered primary graft failure and had autologous marrow recovery. 3 patients died of infection and 1 patients died of acute renal failure before recovery of neutrophil. 1 patient died of pneumonia 8 months after allo-HSCT. 1 patient become thrombocytopenia after allo-HSCT. The other 16 patients are all disease-free. With a median of 2 years follow-up, the overall survival rate and disease-free survival rate are 77.3%±8.9% and 71.3%±10% respectively.

Conclusions

Allo-HSCT could be a feasible way to control infection for children with aplastic anemia in the present of refractory active infections.
Background and aims

Acute respiratory infections (ARIs), with viral pathogens as the major contributors, are the most common illnesses worldwide, and increase the morbidity and mortality among the population. The clinical and pathological features of elderly people with ARIs need to be identified for disease intervention.

Methods

From October 1st, 2016 through March 1st, 2017, respiratory specimens from children with ARIs were collected from the outpatient and inpatient settings in Shanghai children medical center. Each specimen was tested via multiplex polymerase chain reaction (PCR) for target viral and atypical etiologies including influenza, human rhinovirus (HRV), human para-influenza virus (PIV), adenovirus (ADV), respiratory syncytial virus (RSV), human metapneumovirus (hMPV), human coronavirus (hCoVs) ,human bocavirus (hBoV), Bordetella pertussis (BP), Chlamydia pneumoniae (CP) and Mycoplasma pneumoniae (MP).

Results

A total of 200 patients with ARIs were enrolled, including 112 (56%) males, and the median age was 5 years old. 184 (92%) patients were tested positive for any one of the eight viruses and atypical etiologies , including 130 single infections and 54 co-infections. RSV was the predominant virus (34.24%, 63/184), detected from 20.63% (13/63) of the outpatients and 79.37% (50/63) of the inpatients. Influenza infections presented annual seasonal peaks during winter. Compared with non-influenza patients, those with influenza were more likely to have fever, cough, sore throat and fatigue.

Conclusions

This study identified influenza as the leading viral pathogen among BMT with ARIs. An influenza vaccination strategy needs to be advocated for the elderly population.
CLINICAL ANALYSIS OF 20 CASES OF SEPSIS WITH POSITIVE BLOOD CULTURE IN CHILDREN
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Background and aims

To analysis the clinical features, etiology, laboratory examination, treatment and prognosis of sepsis in children, provide the basis for early diagnosis and treatment.

Methods

A retrospective study was performed on 20 cases with sepsis hospitalized in the second Department of Pediatrics, the First Affiliated Hospital of Guangxi Medical University from Jan 2012 to Dec 2016.

Results

This group of children <2 years of age accounted for 85% of the total, combined with basic disease accounted for 80%. Community-acquired sepsis-related sepsis accounted for 25% (5/20), hospital-acquired infection-related sepsis accounted for 75% (15/20). Sepsis clinical manifestations of non-specific, all children have varying degrees of complications. There was no significant difference between G-group and G+group at laboratory indicators. Bacterial distribution to Gram-negative bacteria infection dominated (60%, 12/20), multiple drug-resistant bacteria detection rate is high (50%, 10/20), two strains of ESBLs and one ESBLs (-) multidrug resistance (MDRO) were detected in 5 Escherichia coli. In gram-positive bacteria, staphylococcus most common, 100% resistant to oxacillin, erythromycin, clindamycin and cefoxitin, resistant to penicillin more than 80%, no vancomycin-resistant strains were detected. 19 patients in this group cured or improved discharge, only 1 case (Burkholderia cepacia infection sepsis) disease progression of respiratory failure, give up treatment discharged.

Conclusions

Sepsis can occur at all ages, most often occur in infants and young children within 2 years of age, mostly associated with underlying diseases. Routine laboratory tests can not distinguish between the type of bacterial infection, antibiotic guidance is still dependent on the use of bacterial culture results.
Background and aims

To estimate the 25-(OH) D and vitamin D binding protein (VDBP) levels in critically ill children in pediatric intensive care unit (PICU), and to examine its relationship with outcomes.

Methods

We enrolled 295 children admitted to PICU; Collected 44 cases of normal children as control group. The serum levels of 25-(OH) D were detected by electrochemiluminescence assay and the serum levels of VDBP were detected by enzyme-linked immunosorbent assay (ELISA). The relationship between 25-(OH) D level and VDBP level, age, serum total calcium, BMI, PRISM III, organ failure rate, mechanical ventilation rate and twenty-eighth day mortality were analyzed.

Results

(1) Compared with the control group, the levels of 25-(OH) D and VDBP were lower in the study group, and the difference was statistically significant (P < 0.05). (2) The deficiency group was oldest and lived longest in PICU, highest marks PRISM III, the difference was statistically significant (P < 0.05).(3) Check PICU 1st day and 7th day 25-(OH) D/VDBP level lower, the PRISM III higher, the difference was statistically significant (P < 0.05) .(6) In 295 cases of critically ill children, deaths compared with the survival group ,the 25-(OH) D levels lower and PRISM III higher, the difference was statistically significant (P < 0.05).

Conclusions

(1) The 25-(OH) D/VDBP levels insufficient or deficiency in critically ill children, especially in sepsis or MODS and surgical disease in children.(2) 25-(OH) D/VDBP levels insufficient or deficiency children have higher PRISM III ,live longer in PICUand high mortality rate of 28th day.
WSPD7-0630
EPOSTERS DECEMBER 2-5 - 09:45-17:00
CLINICAL INFECTIOUS DISEASE

25(OH) D STATUS IN CHILDREN WITH SEPSIS AND ITS RELATIONSHIP WITH OUTCOMES AND IMMUNITY: A PROSPECTIVE OBSERVATIONAL STUDY
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Background and aims

To estimate the 25(OH)D status in children with sepsis in pediatric intensive care unit (PICU) and to examine its relationship with outcomes and immunity.

Methods

We enrolled one hundred and sixteen children with sepsis admitted to PICU of The First Affiliated Hospital of Guangxi Medical University between February 2015 and August 2016. Serum 25(OH)D was measured with electrochemical luminescence, categorized as sufficiency (>75 nmol/L), insufficiency (50-75 nmol/L), deficiency (<50 nmol/L). We analyze the 25(OH)D status at admission and its association with clinical data, 28-day mortality.

Results

(1) Among the 116 children: the prevalence of 25(OH)D deficiency was 44.8% (52/116), the 28-day mortality was 24.1% (28/116). (2) On multivariable analysis: high 25(OH)D levels is a protection factor of outcomes in children with sepsis (RR= 0.979, 95% CI =0.963 -0.995), high PRISM is an independent risk factor of outcome (RR=1.127, 95% CI =1.061-1.197. (3) The median survival time was significantly shorter in 25(OH)D deficient children (20.6d) than in those who with sufficiency (25.39d) and insufficiency (23.8d).

Conclusions

1. The study results demonstrate that a high prevalence of 25(OH)D deficiency in children with sepsis. 2. 25(OH)D status is not associated with humoral immunity and cell-mediated immunity in children with sepsis. 3. 25(OH)D status is associated with clinical outcomes in children with sepsis in PICU, improving 25(OH)D level may be a positive adjuvant therapy.
INDIVIDUAL SYMPTOMS DO NOT PREDICT SPECIFIC RESPIRATORY VIRAL INFECTIONS, BUT CLINICAL PATTERNS MAY BE USEFUL - INSIGHT FROM A PEDIATRIC INCEPTION COHORT IN BERLIN, GERMANY

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**Background and aims**

In resource-limited settings, paediatricians may diagnose respiratory viral infections based on “clinical suspicion” rather than virus diagnostics. There are currently no evidence-based clinical criteria available that could replace diagnostic testing. We established a data-driven real-time surveillance system to identify clinical patterns that may support the design of diagnostic algorithms.

**Methods**

An inception cohort of 6073 children with influenza-like illness at the Charité Department of Pediatrics (12/2009-04/2015) was analysed to identify clinical features in an unbiased setting. Nasopharyngeal samples were PCR-tested at the Robert-Koch Institute for 8 key respiratory pathogens. Kullback-Leibler (KL) and decision-tree analyses were computed to identify clinical features or patterns that may predict a specific respiratory viral pathogen.

**Results**

KL-analysis revealed that infections with influenza, RSV, adenovirus, human metapneumovirus, bocavirus, rhinovirus, parainfluenzavirus, or coronaviruses could not be distinguished based on the presence/absence of one clinical feature.

Decision-tree analysis for influenza revealed a predictive accuracy of 61% when using patterns of multiple symptoms, 66% when adding risk-factors, and 86% when including (Flu/RSV) rapid diagnostic test results.

Accuracy rates for RSV were 67%, 71%, and 82%, respectively.
The remaining respiratory pathogens yielded lower accuracy rates (Figure 1).

**Conclusions**

Pediatricians should be aware that respiratory viral infections in children cannot be distinguished based on individual symptoms alone. Machine learning methodologies help to identify clinical patterns facilitating diagnostic algorithms and targeted use of rapid diagnostics.
DIAGNOSTIC ACCURACY OF MODIFIED CENTOR SCORE IN CONFIRMED CASES OF GROUP A STREPTOCOCCAL ACUTE PHARYNGITIS IN CHILDREN OF AGE 3-12 YEARS

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Background and aims

Acute pharyngitis is a common condition observed in outpatients seeking healthcare provision. Group A β-hemolytic streptococci (GAS) requires an etiologic diagnosis and specific treatment. Clinical scoring systems have been developed to predict the risk of GAS pharyngitis. One of commonly used scoring system is the Centor score. Aim of this study was to determine the diagnostic accuracy of modified Centor score in confirmed cases of group A streptococcal acute pharyngitis in children of age 3-12 years.

Methods

This cross sectional study was conducted in the Division of Paediatric Infectious Diseases, Department of Paediatrics, King Edward Medical University/ Mayo Hospital, Lahore from July 2015 to June 2016 (ongoing). All the patients between 3 to 12 years of age presenting with acute pharyngitis were included. The demographic profile of patient was recorded. Modified Centor score was applied. The throat swab for culture was sent to the Paediatric Microbiology laboratory. Each child was treated according to the individual merit. Data were analyzed through SPSS 20.0. Diagnostic accuracy (sensitivity, specificity, positive and negative predictive value) was determined by entering the data in contingency table.

Results

Total 100 children of age 3-12 years were included (Ongoing study). Mean age was 6.4±2.97 years. The sensitivity, specificity, positive and negative predictive value of modified Centor score at ≥4 in predicting group A streptococcal acute pharyngitis in children was 85%, 91%, 69% and 93% respectively.

Conclusions

The modified Centor score is a sensitive screening tool in predicting group A streptococcal acute pharyngitis in children of age 3-12 years, particularly in resource limited settings.
Bacillus Calmette–Guérin (BCG) vaccine is administered to all newborns in countries where tuberculosis is endemic. BCG vaccine may cause some complications. In this study we assessed the clinical characteristics and immunogenetics of three BCG-osis patients after BCG vaccination.

In this descriptive study the clinical features and immunological functions of three BCG-osis patients were assessed according to standard procedures.

Two patients were girls and one was boy. These patients were healthy at birth also had no contact history of TB. All of these patients were vaccinated. The median onset of BCG-osis was 5.6 months old. All patients present BCGosis manifestations and were associated with Mendelian susceptibility to mycobacterial disease. One patients had salmonellosis simultaneously. Fever, skin lesion, hepatomegaly, osteomyelitis, submandibular lymphadenopathy, hepatosplenomegaly were seen in 33.3% of patients. All patients had lymphadenitis axillary, tenderness and Leukocytosis. Serum immunoglobulin levels (IgG, IgM, IgA, IgE) in all patients were normal. The number and percent of CD3, CD4, CD8, CD19, and CD20 were in normal range in all patients. CH50 level and NBT results were normal in all cases. 33.3% of patients had IL12/23 receptors deficiency. Also interferon gamma receptor deficiency was seen in all patients. All patients were treated with anti-tuberculosis drug and IFN-gamma. The patient with salmonellosis was cured by Ceftriaxone in addition to anti-TB drug and IFNγ treatment.

BCGosis is a significant index of immunodeficiency. Severe complications of BCG vaccine may be associated with immune deficiency in IL 12/23 and gamma interferon.
ALA-PDT COMBINED WITH ANTIBIOTICS FOR THE TREATMENT OF INFECTED VASCULAR TUMOR: OUTCOMES AND SAFETY

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Background and aims

Photodynamic therapy (PDT) has been shown to be a very successful new therapy in clinical practice, and its usefulness as a treatment for bacterial infections. Infected vascular tumor, hemangiomas in proliferation stage contaminate with rare refractory infection. The aim of this study was to evaluate the efficacy and safety of 5-aminolevulinic acid photodynamic therapy (ALA-PDT) combined with antibiotics for the treatment of infected wound in vascular tumor patient.

Methods

In this study, 30 patients with infected wound were treated with ALA-PDT combined with antibiotic therapy. These patients were diagnosed with clinical anamnesis, dopler USD, bacterial culture and microarray analysis, tests that were also useful for identifying the strains responsible for the infections. In addition to being treated with antibiotics, the skin was also treated locally with ALA-PDT (20% ALA was applied to the lesion and incubated in the dark, then, the lesion was irradiated with a red light with an energy density of 100J/cm2) every 10days for a total of 3-5 sessions.

Results

All 30 patients enrolled in the study were cured with 100% efficiency after receiving combination therapy with ALA-PDT and antibiotics for three months. Additionally was observed improvement of tumor as volume and area reducement. All patients experienced redness and pain during treatment but did not experience any other forms of severe discomfort and were satisfied with the results of their treatments.

Conclusions

Local ALA-PDT combined with antibiotics is a safe and effective method of treating infected wound in proliferating vascular tumor. Also method provide improvement in tumor reducecment.
A 9 YEAR OLD BOY WITH MENINGOCOCEMIA AND KERATO-CONJUNCTIVITIS: A CASE REPORT

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Neisseria Meningitidis causes meningococcal disease worldwide with the highest incidence found in the meningitis belt of sub-Saharan Africa. Meningococcal epidemics occur in cycles ranging between 8-15 years in the meningitis belt. Nigeria experienced a large N. Meningitidis serotype C (NmC) epidemic in 2015 with 55,000 suspected cases and more than 2000 deaths. This year, a total of 9656 meningitis cases were reported nationwide, 601 deaths and Case Fatality Rate [CFR] of 6.22% while in Kano State there were 320 suspected cases, 28 confirmed cases, 25 deaths and a Case Fatality Rate of 8%. Neisseria meningitidis rarely causes primary kerato-conjunctivitis leading to potentially fatal systemic invasion. In this case we report a case of systemic invasion which led to kerato-conjunctivitis.
Background and aims

*Streptococcus pneumoniae* is an important pathogen in infectious diseases worldwide, and serogroup 6 *S. pneumoniae* is very popular in China. The aim of the study was to investigate the serotype distribution, antibiotic resistance pattern and the molecular characteristics of 215 serogroup 6 *S. pneumoniae* isolates collected from hospitalized children in China during 2013-2016.

Methods

Serotypes were determined using Quellung reaction with antisera. Antibiotic resistance against 11 antimicrobials was tested using the E-test method or disc diffusion. The sequence types (STs) were assigned with multilocus sequence typing (MLST). Data analysis was acquired with the WHONET 5.6 software.

Results

The percentage of serotype 6A, 6B, 6C and 6D among the 215 serogroup 6 strains were 50.7% (109/215), 36.3% (78/215), 12.6% (27/215) and 0.5% (1/215) respectively. All of the strains were susceptible to levofloxacin and resistant to erythromycin. No isolate was resistant against parenteral penicillin, but the intermediate and resistant rate reached 72.6% (156/215) and 5.1% (11/215) based on the oral breakpoint. Sixty-seven STs were detected in the present study, with 14 were newly assigned. The most common clonal complexes (CCs) were CC3173 (26.5%, 57/215), CC9789 (13.5%, 29/215), CC90 (13.0%, 28/215) and CC902 (8.8%, 19/215), and the nonsusceptibility rate of these four CCs against penicillin and cefuroxime (penicillin: 98.2%, 100%, 100%, 100%; cefuroxime: 98.2%, 100%, 96.4%, 94.7%) were higher than the overall level of serogroup 6 isolates (penicillin:22.3%; cefuroxime: 29.8%).

Conclusions

6A is the most common serotype of serogroup 6 *S. pneumoniae* strains. Different CCs/STs express diverse antibiotic resistance pattern.
ANALYSIS OF CLINICAL FEATURES OF INVASIVE PULMONARY FUNGAL INFECTION IN YOUNG CHILDREN

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Background and aims

In recent years, the incidence of deep mycoses in children increased remarkably in China. To provide the helpful diagnostic indications, timely and effective treatment, clinical features of 52 young children with invasive pulmonary fungal infection were analyzed.

Methods

The clinical data, including clinical symptoms, laboratory examinations, radiologic imagines, treatment programs and outcomes, were analyzed retrospectively.

Results

① Host factors: 49 cases (94.23%) were under 3 years old. 51 cases (98.98%) received broad-spectrum antibiotics before. There were 9 cases (17.3%) who ever received systemic steroids and 35 cases (67.31%) had the history of hospitalization in other sites; ② Microbiological evidence: 16 cases (30.77%) were diagnosed with fungal evidence and others (36 cases) were possibly diagnosed as the antifungal therapy was effective, despite of no pathogen evidence; ③ Clinical manifestation and laboratory examination: Pulmonary aspergillosis or candidiasis with sustaining high fever showed the characteristics of significant elevated band proportion (>20%) with normal WBC and CRP. The respiratory symptoms and signs were absent in cryptococcus neoformans infection, while hepatosplenomegaly was apparent and eosinophil increased; ④ Imaging findings: nodular, irregular cord-like shadow were common, 27 cases (51.92%); patchy shadow in 11 cases (21.15%); unilateral or bilateral mass shadow in 10 patients (19.23%) and hyaline change in 4 cases (7.69%).

Conclusions

Younger age, the use of broad-spectrum antibiotics and/or corticosteroids, a history of hospitalization are the risk factors. Aspergillus is the mainly pathogen of deep mycoses. Elevated band proportion can serve as an early indication of pulmonary fungal infection with high fever. Imagination is helpful in the diagnosis and treatment of invasive fungal infection.
Background and aims

To compare the clinical characteristics of pertussis and pertussis-like syndrome in children.

Methods

The 138 patients with pertussis symptoms admitted to the respiratory department of Children's Hospital of Hebei province from December 2014 to January 2017. According to whether bordetella pertussis PCR of the pharyngeal swab positive or not, the subjects were divided into pertussis group (54 cases) and pertussis-like syndrome group (84 cases). The clinical characteristics were compared between the two groups. analysis was conducted for pertussis-like group.

Results

(1) Pathogenic: The positive detection rate of bordetella pertussis was 39.1% (54/138) in all children with pertussis symptoms. The pathogen of pertussis-like syndrome were virus mainly, those were virus, respiratory syncytial virus, para-influenza virus, mycoplasma pneumoniae in turn.
(2) In two groups there were no differences in age, sex, fever, inspiratory whoop, wheezing, cyanosis, leukocyte count, lymphocyte proportion, admission length (P > 0.05). The rate of vaccination in pertussis-like syndrome group was higher than that in the pertussis group (P < 0.05).

Conclusions

There were no significant to diagnosis pertussis and pertussis-like syndrome by clinical manifestations and routine blood test. The diagnosis of pertussis requires pathogen detection. Then the pathogen of pertussis-like syndrome is given priority to virus. Vaccination can reduce the prevalence of pertussis.
THE CLINICAL CHARACTERISTICS AND PROGNOSTIC FACTORS OF PSEUDOMONAS AERUGINOSA SEPSIS IN CHILDREN

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Background and aims

To investigate the clinical characteristics and prognostic factors of Pseudomonas aeruginosa sepsis in children

Methods

collected in January 2010 to December 2016 in our hospital hospitalized 46 cases of Pseudomonas aeruginosa sepsis children with the study object, with the exception of other bacteria or consider the value of bacteria child.

Results

(1) 46 children with Pseudomonas aeruginosa (PA) sepsis, under 1 year was 73.9% (34/46). (2) The clinical features of children with PA sepsis were various, The most common sites of infection were respiratory tract 56.5% (26/46), followed by gastrointestinal tract 32.6% (15/46) and skin 6.5% (3/46) and so on. Among all the causes of Systemic organ dysfunction (3) Factors associated with poor prognosis were underlying disease, coagulation dysfunction, and the number of organ dysfunction. Logistic analysis showed that the factors associated with poor prognosis were the number of organ dysfunction(4) Its clinical manifestations were not typical, most of the more high fever, the most common respiratory infections, followed by digestive tract and skin infections; and lead to multiple organ dysfunction, especially respiratory dysfunction. PA sepsis poor prognosis of independent risk factors for the number of organ dysfunction, 1 hour after antibacterial treatment

Conclusions

Children with Pseudomonas aeruginosa sepsis, occur in infants and young children, especially within 1 year of age. Its clinical manifestations are not typical, the most common respiratory infections, followed by digestive tract and skin infections; and lead to multiple organ dysfunction, especially respiratory dysfunction. PA sepsis poor prognosis of independent risk factors for the number of organ dysfunction, 1 hour after antibacterial treatment.
Background and aims

The objective of present study was to examine the concentration of 27 cytokines in CSF in neonates with sepsis and bacterial meningitis, by which to characterize the cytokine concentrations in those patients and explore the change of cytokine concentrations over time in neonatal bacterial meningitis. Furthermore try to show the association between imbalance of proinflammatory and anti-inflammatory mediators and outcome in bacterial meningitis.

Methods

Fifty-eight patients were enrolled from August 1st, 2015 to November 31st, 2015 in the neonatal department at Children’s Hospital of Fudan University. Eligible patients were classified into 3 groups: bacterial meningitis group (n=10), sepsis group (n=12) and control group (n=38). CSF samples were collected at the time of clinical suspicion of bacterial meningitis. Outcomes of patients with bacterial meningitis were assessed on the day of discharge.

Results

TNF-α and IL-10 in bacterial meningitis group were significantly higher than those in control group. Significant increase of IL-7 and IL-10 in sepsis group was observed when compared to those of control group. In bacterial meningitis group IFN-γ, IL-8 and MCP-1 were significantly increased on third day compared with those on first day during the course of infection. In the patients with bacterial meningitis, concentrations of IL-6, IL-1β, TNF-α, IL-10 and IL-6/IL-10 were significantly elevated in those with unfavorable outcome.

Conclusions

Cytokine concentrations in CSF were significantly higher in newborns either with sepsis or bacterial meningitis. The imbalance of proinflammatory and anti-inflammatory cytokines may be an important predictor of the unfavorable outcome in newborns with bacterial meningitis.
Purpose:
Objective to investigate the infection of children died after liver transplantation.

Method:
Clinical data of 47 children who died with infection after liver transplantation from Department of liver surgery of Renji hospital and Pediatric intensive care unit of Shanghai Children's Medical Center from January 2006 to October 2015 were retrospectively analyzed.

Result:
General condition: There were 62 patients died after surgery during this period, 47 cases (female/male:20/27) experienced infections. Congenital biliary atresia was the most frequent disease (41/47, 87%). The average age is 23 months, 33 (70%) children were less than one year old. Surgical procedures included 35 cases of living donor liver transplantation (LDLT), 7 cases of split-liver transplantation and 5 cases of orthotopic liver transplantation (OLT). 33 cases died in one month after surgery.

Infection site and the time of occurrence: 16 cases of pretransplant infections (100% pneumonia) occurred and several cases aggravated during posttransplant period. 20 cases of infections (intra-abdominal, 14/20, 70%) developed in the first month after operation, 6 cases of infections (5 pneumonia and 1 intra-abdominal infection) were found between the first and sixth month, 5 cases (intra-abdominal infection and pneumonia) occurred after the sixth month. Except for the common infection sites, a small number of cases co-infected with urinary tract, bacteremia or catheter related infection after surgery.

Pathogens: Determined pathogen was found in 34 cases (34/47, 72%) and 44% (15/34) cases were multi-pathogen infections. The most common pathogen was bacterium, accounting for 50% (17/34) cases, common bacterial pathogens were gram-negative organisms (Acinetobacter baumannii, Stenotrophomonas maltophilia, Klebsiella enteric bacilli, Neisseria sicca and escherichia coli), 16 cases were infected with fungi (47%), including Candida albica and mould. Viruses (32%) such as EBV, CMV and HBV were detected in 11 cases.

Conclusion:
Most of the pediatric patients died in the early posttransplant period with pneumonia or intra-abdominal infections in our study. Extensively drug resistant acinetobacter baumannii and mold were the most common source of pathogens. Attention to the treatment of pretransplant infection, early adjustment of immunosuppressive drugs, reasonable use of antibiotics, positive control of nosocomial infection pathway is necessary for improving the prognosis of pediatric patients after liver transplantation.
Background and aims

Aspergillus species are rare causes of infectious otitis. Herein we present an adolescent case of Aspergillus otitis with the diagnosis of insulin resistance.

Results

A sixteen year old girl, who was suffering from right ear pain and purulent drainage for a month. She didn’t have a history of recurrent otitis, swimming or trauma. She was unresponsive to intramuscular ceftriaxone and oral ciprofloxacin treatment given before. She was followed up with the diagnosis of insulin resistance. On her physical examination right external auditory canal was hyperemic and sensitive, there was white mucoid secretion on ear drum and external auditory canal. Ampirically local ciprofloxacin and eau-borique were given after microbiological sampling. She was unresponsive to these medications. There was no bacteria in gram stain but fungal hyphae structure was seen on microbiologic examination. Her complaints were going on and a local antifungal agent (cyclopirox o lamin) was given. On the third day of topical treatment she still had severe ear pain. Aspergillus species were grown in the culture of the drainage from ear canal. Voriconazole treatment was started orally. Her complaints resolved quickly and treatment was completed to 14 days. Her temporal tomography and immunologic tests were normal. Her physical examination was also normal after the treatment.

Conclusions

Acute fungal otitis due to aspergillosis is a rare disease in children. It should be kept in mind in patients who are refractory to antibiotic treatment and who have insulin resistance.
A CASE OF SEPTIC OR VARICELLA ARTHRITIS? DUE TO VARICELLA ZOSTER VIRUS

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Background and aims

Varicella zoster virus (VZV) infection in children is generally a mild disease. Bacterial arthritis is a rare complication of varicella. Herein we present a case of arthritis due to VZV.

Results

Case: A 9 year-old boy was admitted with complaints of swelling, pain and limitation of movement of right knee to our hospital. He had pruritic vesicular rash for the last 2 days and a history of trauma to the right knee. His body temperature was 38.2°C. On physical examination, right knee was swelling and painful with flexion. There was no erythema (Figure 1) Also he had vesiculopapular rash in his body. White blood cell count (WBC) was 17360/mm³, C-reactive protein (CRP) was 52 mg/dl and erythrocyte sedimentation rate (ESR) was 35 mm/h. Articular punction was done by orthopedic surgeons. Synovial fluid WBC count was 10500 mm³. The biochemical values of the liquid content were lactate dehydrogenase 955 U/L, glucose <25mg/dL. Intravenous ampicillin-sulbactam (150 mg/kg/d) therapy was started. Because of persisting fever clindamycin (40 mg/kg/d) was added. Macroscopically purulan drainage was aspirated from joint, at surgical drainage on the second day. No microorganism grew in joint fluid culture. The VZV PCR from the joint fluid was positive. On the 11th day swelling and pain resolved, CRP and ESR became negative. Ampicillin-sulbactam and clindamycin therapy was completed to 14 days. He was discharged with oral amoxicillin-clavulanate, and total antibiotic treatment was given for 3 weeks.

Conclusions

Although varicella infection is generally benign, rare complications such as primary or secondary bacterial arthritis may develop.
CLINICAL CHARACTERISTICS OF CHRONIC SUPPURATIVE LUNG DISEASE IN SOUTHWEST CHINA
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Background and aims

Chronic suppurative lung disease (CSLD) is an important cause of chronic wet cough in children, which has the clinical manifestation of bronchiectasis but lack of its typical radiographic changes. The present study aims to summarize the clinical characteristics of patients with CSLD in our medical center.

Methods

A retrospective chart review was undertaken in hospitalized children who presented with chronic wet cough, unresponsive to oral antibiotics, and without symptoms and signs of other diagnosis.

Results

All the 46 chronic wet cough patients showed normal or nearly normal radiographic images, absent from bronchiectasis changes. The median age was 10 (3-109) months. The duration of cough was 14.70 (4.7-157) weeks. 34(73.9%) patients combined with wheezing. All the diagnostic bronchoscopy presented with purulent bronchitis, airway abnormalities were identified in 22(47.8%) patients, 15 (32.6%) had airway malacia and 12 (26.1%) had airway stenosis, among whom 5(10.9%) were airway malacia coexisting with stenosis. Patients with airway abnormality patients were significantly younger (7.0 months vs 16.0 months, P=0.000) than those without airway abnormality. The distribution of pathogens in bronchoalveolar lavage fluid (BALF) showed a predominance of Streptococcus pneumoniae (26.9%), followed by Escherichia coli (23.1%), Haemophilus influenza (19.2%). The cellular differential counts of BALF revealed neutrophilia. 46(100%) patients received intravenous antibiotics and airway clearance therapy, the average course was 14.45±4.89 (6-24) days.

Conclusions

CSLD is a syndrome with chronic wet cough, all the patients present with purulent bronchitis under bronchoscopy, and the cellular differential counts of BALF reveal neutrophilia. We emphasize the use of intravenous antibiotics assisted with airway clearance therapy.
THE CLINICAL STUDIES ON BRONCHOSCOPY INTERVENTIONAL THERAPY IN THE SEGMENTAL CHILD MYCOPLASMA PNEUMONIA PNEUMONIA

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Background and aims

Community-acquired pneumonia (CAP) due to Mycoplasma pneumoniae is usually mild, but some cases develop a severe life-threatening pneumonia. We aimed to study the bronchoscope interventional therapy in children’s segmental Mycoplasma pneumonia pneumonia (MPP), and discusses the best time for the disease treatment.

Methods

We collected the data of patients with segmental MPP who admitted to Children’s Hospital of Tianjin on January, 2015 to December, 2015. 120 cases were admitted in the research. 90 cases were randomly divided into bronchoscopy interventional treatment group (group A) and the others were control group (group B). Group A was divided into A1 (< 7 days), A2 (7-14 days) and A3 (15 to 30 days) according to the course of disease on admission, 30 cases in each group.

Results

Two groups have no differences in the age, sex, clinic manifestation, incidence of severe MPP and the ratio of glucocorticoid utility (p > 0.05). The time of temperature returned to normal, imaging recovery, the average hospitalization, glucocorticoid adhibition was shorter in group A when compared to group B (p < 0.01). The treatment effective rate in group A (94.4%) was significantly higher than the control group 80% (p < 0.05). The group A2 have the shortest time in the imaging recovery and the length of hospital stay compared with group A1 and A3 (p < 0.05).

Conclusions

The bronchoscope interventional treatment have an obvious advantage in treatment of segmental mycoplasma pneumonia pneumonia, and the best time of was in the course of 7 to 14 days.
Background and aims

Respiratory viral infections (RVI) in fever and neutropenia (FN) episodes in children with cancer has been less characterized than bacterial infections. Our aim was to associate respiratory disease severity with viral loads, viral excretion period and levels of pro-inflammatory cytokines in children with cancer, fever and neutropenia with detection of a respiratory virus.

Methods

Prospective, multicenter, cohort study in children with cancer and FN admitted to three hospitals in Santiago, Chile (September 2013-October 2015). Children with molecular detection of a respiratory virus at admission were studied with consecutive nasopharyngeal and nasal wash sample (at day 1, 3, 7 and 15-30) for quantitative PCR (for RSV, rhinovirus, influenza and parainfluenza). A panel for 38 cytokines was performed; the results were associated with clinical outcome.

Results

A total of 337 episodes of FN were enrolled of whom 43% were male, 55% had leukemia as underlying malignancy and the median age was five years. RVI was detected in 28% (94/337). Most detected viruses were rhinovirus, followed by RSV, parainfluenza and influenza. Consecutive viral loads and excretion period for each virus are described in figure 1. Clinical outcome in terms of upper or lower respiratory tract disease, days of hospitalization, oxygen requirement, admission to PICU and
Conclusions

Viral loads were not associated with clinical severity, viral excretion, or a higher cytokine response, measured in nasal lavage. Our data showed a favorable outcome in all RVI episodes. This is a novel report about clinical outcome associated with viral loads and cytokine response in RVI causing FN episodes in children with cancer (FONDECYT 1130911-1171795).
Central nervous system (CNS) complications of influenza are rare in children. We aimed to evaluate neurologic complications and clinical outcome of children hospitalized with influenza. Data of children hospitalized with laboratory-confirmed influenza infection from January 2015 to June 2017 in a tertiary care hospital were reviewed retrospectively.
HIV-EXPOSED UNINFECTED INFANT PRESENTING WITH PNEUMONIA
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With improved use of antiretroviral medications, the risk of mother to child transmission has declined significantly. However, the number of HIV-exposed but uninfected infants is growing. Here we present an HIV-exposed infant who developed pneumonia while taking ZDV prophylaxis.
STENOTROPHOMONAS MALTOPHILIA: INAPPROPRIATE CULTURE OBTAINING TECHNIQUE MAY LEAD TO FALSE POSITIVE RESULTS
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Stenotrophomonas maltophilia is a nonfermenting Gram-negative bacillus which commonly resides in water, soil, and sewage. It is an opportunistic pathogen causing blood stream infections in immunocompromised patients. It can also colonize endotracheal tubes. We aimed to evaluate patients with S. maltophilia growth in a tertiary care center.
Brain abscess as a complication of ear infections has decreased in frequency. By contrast, brain abscess arising from a sinus infection remains an important consideration in both adults and children. Here we present 5 cases with brain abscess.
APPLICATION OF HIGH-THROUGHPUT SEQUENCING TECHNIQUE IN THE CHILDREN OF SEVERE PNEUMONIA WITH UNKNOWN PATHOGENS
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Background and aims
Analysis 15 cases children of severe pneumonia with unknown pathogens with the high-throughput sequencing technology, for clinical diagnosis and treatment to provide laboratory basis

Methods
Bronchoalveolar lavage fluid (BALF) in 15 cases of children with severe pneumonia who were not detected by routine detection for high-throughput sequencing in April and May of 2017. While taking specimens in our hospital for respiratory virus antigen immunofluorescence detection and all BALF sequencing positive samples were verified by PCR

Results
A total of 15 cases severe pneumonia with unknown pathogens, 9 cases of imaging findings for bilateral multiple patchy consolidation of the high density shadow, 4 cases of unilateral consolidation shadows with a small amount of pleural effusion, 2 cases of segmental atelectasis. All children sputum culture, throat swab pneumonia mycoplasma, chlamydia trachomatis and whooping cough were negative for DNA, influenza antigen test were negative, pharyngeal swab respiratory virus immune antigen detection were negative. All children were examined by bronchoscopy and alveolar lavage, 2 cases of sucking tree-like secretions. 15 cases of BALF by high-throughput sequencing prompted all adenovirus B1, by PCR verification were adenovirus, amplified virus gene sequence by sequencing analysis with human adenovirus type 3/7. Our BALF of respiratory disease antigen immunofluorescence prompted adenovirus positive 8 cases, 15 cases of BALF bacteria cultures were negative.

Conclusions
The sensitivity and accuracy of high-throughput sequencing technology are significantly higher than those of conventional detection technology, and provide sensitivity and accurate laboratory data for clinicians in the case of acute infection and unknown pathogen
MONITORING AND ANALYSIS OF INFLUENZA OF HOSPITALIZED CHILDREN IN SHENZHEN CHILDREN’S HOSPITAL FROM 2012 TO 2016
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Background and aims

The current monitoring of influenza in China is mainly focused on outpatients with mild signs of influenza, lack of severe and critically ill patients with influenza. We carry out routine influenza surveillance in hospitalized lower respiratory tract infection in Shenzhen Children’s Hospital from January 2012

Methods

For patients with acute lower respiratory tract infection, routine influenza virus testing was performed from January 2012 to December 2016. Epidemiological and seasonal analysis of the data

Results

A total of 28,883 people were detected in 5 years and 1117 cases were positive for influenza. The total detection rate was 3.87%. The detection rates of influenza virus in spring, summer, autumn and winter were 4.76%, 3.53%, 2.28% and 4.63% respectively. The detection rates of influenza virus were 9.50%, 2.47%, 3.75%, 2.62%, and 4.84% respectively. Continuous monitoring for 5 years, there are two influenza virus epidemic peaks, March-August 2012 and March 2016. 7 people were died in January 2012 to December 2016, Aged from 10 months to 4 years and 4 months old, 4 males and 3 females; 3 cases of children with underlying diseases, 1 case of acute lymphoblastic leukemia chemotherapy bone marrow in the inhibition period, 1 case of familial autosomal dominant necrotic encephalopathy, 1 case of nephrotic syndrome, 3 cases of children with acute necrotizing encephalopathy, 2 patients with no underlying disease who were associated with severe sepsis caused by invasive streptococcus pneumoniae infection.

Conclusions

The high incidence of influenza in Shenzhen was in the spring. The main cause of child death is influenza-associated acute necrotizing encephalopathy and secondary bacterial infection.
CLINICAL ANALYSIS OF HEMOPHAGOCYTIC SYNDROME SECONDARY TO MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN

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Background and aims

To explore the clinical characteristics, treatment and prognosis of hemophagocytic syndrome (HPS) secondary to refractory pneumonia mycoplasma pneumonia in children.

Methods

A retrospective investigation of the clinical manifestation, laboratory test, imagelogy, clinical course, and outcome of hemophagocytic syndrome (HPS) secondary to refractory pneumonia mycoplasma pneumonia between June 2013 and May 2017 in Shenzhen children's hospital.

Results

The male in 8 cases of children with 4 cases, female 4 cases, aged from 7 months ~ 8 years old. Clinical manifestations of persistent high fever, cough, reduced whole blood cells, elevated ferritin, coagulation abnormalities, Mycoplasma pneumoniae antibody positive and or throat swab DNA positive, chest computed tomography (CT) revealed a large patch of consolidation lung shadow, including 3 cases with massive pleural effusion. 6 cases by bronchoscope examination and alveolar lavage, 4 cases were taken out of tree-like secretions. 3 cases were treated with anti-infection and a large number of gamma globulin treatment, 2 cases recovery after received anti-infection and glucocorticoid, high-dose gamma globulin treatment, despite the combination of dexamethasone, cyclosporine A (CSA) and etoposide (VPl6) triple therapy, the final death of 2 cases, 1 case was still in the midst of triple therapy. 5 cases were followed up for 1 to 3 years without recurrence.

Conclusions

Early diagnosis and timely immunosuppressive therapy is very important, glucocorticoid and high-dose gamma globulin treatment is effective. Age small, long course, combined infection, multiple organ system involvement, tend to be associated with bad
BRONCHOALVEOLAR LAVAGE FLUID MICROBIOTA DYSBIOSIS IN INFANTS WITH PROTRACTED BACTERIAL BRONCHITIS

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Background and aims

Protracted bacterial bronchitis (PBB) is a chronic purulent bronchitis which could cause recurrent coughing and wheezing in infants. Based on previous reports, main pathogens which caused PBB were identified in the patients, but their impacts on lung microbiota dysbiosis and human immune system remains unclear.

Methods

12 PBB infants (PBB group) and 12 tracheomalacia infants (C group) BALF (bronchoalveolar lavage fluid) was collected for 16S rDNA amplicon analysis. Based on the results of bacterial combination, the microbiota diversity and co-occurrence network in PBB group and C group were detected and compared.

Results

Microbiota diversity was higher in PBB group than in the C group. The PBB group was found to harbor 25 accumulated bacterial agents by comparison with C group, including Haemophilus (P = 0.004) and Bacteroides (P = 6×10⁻⁵), which have been implicated in interleukin-1α (IL-1α) and IL-17 (interleukin-17) secretion. The populations of Lactococcus (P = 1×10⁻⁶) and Lactobacillus (P = 2×10⁻⁵) were dramatically smaller in the PBB group. The co-occurrence network in the PBB group also differed from that of the C group. It contained 4 core nodes, including Haemophilus, Parabacteroides, Porphyromonas, and Cronobacter. Haemophilus was found to be negatively associated with most counterparts, including Clostridium and Bacillus, which were found to promote transforming growth factor β (TGF-β) secretion and repress T helper cell 17 (Th17) differentiation.

Conclusions

These findings may deepen our understanding of PBB pathogenesis, and it also provided a foundation for bacterial adjunctive therapy of infantile PBB in accordance with clinical treatment.
ANALYSIS OF DEATHS OF CHILDREN WITH A (H1N1) INFLUENZA IN SHENZHEN
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Background and aims

To understand after the a (H1N1) influenza pandemic of 2009, the flu lead to clinical features of critically ill children with death and cause of death, in order to understand further the influenza A and provide the basis.

Methods

Analysis of the clinical data of 8 cases of critically ill children with death, which swabs confirmed influenza a nucleic acid testing for a (H1N1) influenza in 2014 – in May 2017. The results were compared with 5 cases of death during the 2009 a (H1N1) influenza pandemic in our hospital.

Results

During the 2009 a (H1N1) influenza, the death cases without basic diseases, but after the 2009 a H1N1 influenza epidemic, 8 cases of deaths with underlying diseases in 3 cases, 1 case of acute lymphatic leukemia chemotherapy in bone marrow inhibition, 1 case of familial autosomal dominant necrotizing encephalopathy; 1 case of nephrotic syndrome. The most common complication of 2009 a (H1N1) influenza leading to deaths were severe pneumonia and necrotizing encephalopathy or encephalopathy, once all necrotizing encephalopathy or encephalopathy in children with convulsions after quickly into a coma. During the 2009 a (H1N1) influenza had 1 case died of secondary fungal pyothorax and fungal meningitis, 2 cases of children with no underlying diseases were secondary severe sepsis from streptococcus pneumoniae infection.

Conclusions

The signs and symptoms of the deaths are also is serious, and has been developing rapidly, into multiple organ function failure. The main cause of death in children is influenza correlation encephalopathy and secondary serious bacterial infection.
Background and aims

Methicillin-resistant Staphylococcus aureus (MRSA) causes high rates of mortality and a substantial burden to health systems worldwide. Here, we investigated the antimicrobial susceptibility and molecular characteristics of MRSA isolated from children treated at Shenzhen Children's Hospital.

Methods

140 MRSA strains were characterized by antimicrobial susceptibility testing. We further performed spa typing, multilocus sequence typing (MLST), staphylococcal cassette chromosome mec (SCCmec), pvl gene and pulsed-field gel electrophoresis (PFGE)

Results

These MRSA strains were sensitive to most non-β-lactam antimicrobial agents. ST59 was the most common MLST lineage (54.3%). Most MRSA isolates belonged to SCCmec IV (64.3%) and V (22.8%). The MRSA-ST59-SCCmec IV-t437 clone was found to be predominant, infecting 28.6% of patients studied. Moreover, 50.7% of MRSA isolates were pvl positive.

Conclusions

We thus report preliminary data on the prevalence and distribution of MRSA genotypes in Shenzhen Children's Hospital. These findings characterize the MRSA colonization dynamics in child patients in China, and may aid design of strategies to prevent MRSA infection and dissemination.
CLINICAL MISDIAGNOSIS ANALYSIS OF 10 CASES OF CHILDREN’S PARAGONIMIASIS WITH PLEURAL EFFUSION AS THE MAIN MANIFESTATION

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Background and aims

To summarize the clinical characteristics in children's paragonimiasis with pleural effusion in Shenzhen and analyze the causes of misdiagnosis.

Methods

The clinical, radiological, laboratory data of 10 cases of paragonimiasis with pleural effusion diagnosed in Shenzhen Children’s Hospital from 2007 to 2017 were retrospectively analyzed.

Results

All of the ten patients had the history of living in the paragonimiasis epidemic foci. Nine of them had the history of eating freshwater crabs or crayfishes. The Main manifestations were fever, dry cough, chest pain and abdominal pain. One case was asymptomatic. Three cases were associated with polyserositis. One case was associated with subcutaneous lump. The number of eosinophils of all these patients increased in peripheral blood. The serum paragonimus antibody of all these patients was positive. The chest computed tomography showed pleural effusion and patchy, nodular, cavernous, or cystic shadows in the lung. Before the diagnosis was confirmed, these patients were misdiagnosed, such as pneumonia, tuberculosis, tuberculous pericarditis, leukaemia.

Conclusions

Although Shenzhen isn’t the paragonimiasis epidemic focus, the migrant population from the paragonimiasis epidemic foci is large. Paragonimiasis should be considered in the patients with unidentified pleural effusion. In order to avoid misdiagnosis, the history of unclean food and infected water contact should be collected in detail. Early diagnosis can be done combined with the clinical manifestation, blood eosinophil count, laboratory and imaging examinations.
ADENOVIRUS DETECTION IN HOSPITALIZED CHILDREN WITH RESPIRATORY TRACT INFECTION IN SHENZHEN

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Background and aims

To investigate the characteristics of adenovirus infection in hospitalized children with respiratory tract infection in Shenzhen.

Methods

Nasopharyngeal swabs obtained from 25602 children hospitalized with respiratory tract infections in Shenzhen Children’s Hospital during 2014 to 2016, were tested for adenovirus with direct immunofluorescence assay. The detection rate of adenovirus and diagnosis in hospitalized children with respiratory tract infection were analyzed.

Results

The total adenovirus detection rate was 2.97% in 25602 samples, with a male to female ratio of 2.04:1, no significantly difference in detection rate in male(3.12%) and female(2.70%). Accounted for 724(95.14%) of the total adenovirus positive detection children below six years old, and 409(53.75%) children were detected below two years old. There was a distinct seasonality; the detection rate was higher in summer and winter, ²(X=36.631, P<0.01). In 761 hospitalized patients of ADV positive, 431 were pneumonia, 109 were bronchitis, 74 were tonsillitis, 14 were conjunctivitis pharynx and 133 were acute upper respiratory infection.

Conclusions

Our study demonstrates that respiratory adenovirus infection is an important cause of hospitalization in children below the age of 6 years in Shenzhen, China. The detection rate was higher in summer and winter than spring and autumn. Most adenovirus positive children were diagnosed by pneumonia, bronchitis and acute upper respiratory tract infection.
Background and aims

To explore the epidemiological trend, clinical characteristics, treatment of measles from 2010 to 2016.

Methods

1890 measles diagnosed in Shenzhen Third People Hospital from January 2010 to December 2016. A retrospective analysis was carried out about clinical and epidemiological characteristics, vaccination, and treatment outcome.

Results

Totally 1890 cases of measles were diagnosed in our hospital. The morbidity of measles increased during 2013-2015. Measles mostly occurred in June and July. 39.0% cases had not been vaccinated. No patient had vaccination twice. Most of the patients had clinic visit before the onset of measles. 209 patients were younger than 6 months among which half patients' mother had been vaccinated. 421 patients were older than 18 years. 2 newborns with measles accounted for their mother's infection. The majority of the patients presented with the typical manifestations such as persistent fever, rash, tears, photophobia, rough oral mucosa and Koplik's spot. Pertussis-like symptom occurred in 10 patients younger than 3 years old. 70.8% patients presented with complications such as bronchopneumonia or pneumonia. Liver dysfunction occurred more frequently in adult measles. All patients were cured.

Conclusions

The number of measles patients increases in infants younger than 8 months old, so it is urgent to suggest that vaccination might be given to those younger than the designated age of vaccination. The infants measles presented a greater morbidity of pulmonary infection, and the adults characterized with more liver damage, which should be paid more attention in the process of diagnosis and treatment.
INVESTIGATION OF VARICELLA-ZOSTER VIRUS (VZV) DNA IN SERUM OF CHILDREN WITH VZV INFECTIONS
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Background and aims

Our aim was to investigate trends in VZV DNA in serum of children with VZV infections.

Methods

We detected VZV DNA in serum by real-time fluorescent PCR for the children who were suspected with VZV infections or in the recovery of these diseases. And their clinical data were included.

Results

We performed 83 tests of VZV DNA in serum and the specimens were from 65 patients who were hospitalized in Shenzhen Children’s Hospital from December 2016 and May 2017. The VZV-DNA in serum were positive in 45 patients and negative in 20 ones. The sensitivity of real-time PCR to detect VZV DNA in serum was 88.2% (45/51), specificity was 100% (14/14), accuracy was 90.8%, and Youden index was 88.2%. In the detected group whose specimens obtained within 7-10 days after onset of the rash, 4 patients were immunocompromised and 8 patients were immunocompetent. Of note, VZV DNA in serum could also be detected of 8 patients who were consisted of four immunocompromised patients and four immunocompetent patients, and the detection rates were 100% and 50%, respectively. After the use of intravenous acyclovir for 7 to 10 days, the detected group were only 3 immunocompromised patients.

Conclusions

It is highly sensitive and accurate to detect VZV DNA in serum by real-time PCR, which is useful for the diagnosis. Immunocompromised hosts with VZV infections have prolonged viremia courses. We recommend that antiviral therapy should be continued until VZV DNA in serum can not be detected in immunocompromised children.
DIFFERENT CLINICAL AND LABORATORY CHARACTERISTICS IN CHILDREN WITH NECROTIZING PNEUMONIA BY STREPTOCOCCUS PNEUMONIAE AND MYCOPLASMA PNEUMONIAE

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Background and aims

To evaluate the clinical features of necrotizing pneumonia (NP), and compare the different characteristics of *Streptococcus pneumoniae*-necrotizing pneumonia (SPNP) and *Mycoplasma pneumoniae*-necrotizing pneumonia (MPNP).

Methods

A retrospective, observational study of NP cases hospitalized in our hospital from January 2008 to December 2014 was conducted, and clinical manifestations, laboratory data, imaging performance, hospital course and outcomes analyzed.

Results

A total of 33 cases diagnosed as NP were identified. Of them, 22 were MPNP, with a mean age of 5.6±2.2 years, and 11 patients were SPNP, with a mean age of 3.1±2.1 years. They had markedly increased CRP levels. 28 (84.8%) patients had pleural effusion and 19 cases required pleural interventions. However, patients with MPNP had significant lower levels of blood WBC count and CRP values, compared to those with SPNP (P<0.01). We also found the values of pleural fluid cell count was 760 (68~1860)×10⁶/L and 16820 (944~50000)×10⁶/L, the median values of LDH was 2671 (673~3993) IU/L and 7320 (3192~29382) IU/L, and the median values of glucose was 5.93 (4.38~7.87) mmol/L and 0.11 (0.00~2.47) mmol/L, respectively in the MPNP and SPNP group, with a significant difference (P<0.01). Meanwhile, higher rate of pleural effusion septation was seen in the SPNP group when compared with the MPNP group (100% versus 0%, P<0.01), and 90.9% of the patients in the SPNP group underwent chest drainage versus 17.6% in the MPNP group (P<0.01).

Conclusions

NP caused by SP and MP are found to be severe, yet, reversible. Clinical and laboratory data can help to differentiate MPNP from SPNP.
CLINICAL OBSERVATION OF CENTRAL VENOUS CATHETER CLOSED DRAINAGE IN THE TREATMENT OF PARAPNEUMONIC PLEURAL EFFUSION IN CHILDREN

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Background and aims

To study the curative effect of central venous catheter closed drainage in the treatment of parapneumonic pleural effusion.

Methods

The clinical data of 393 children with parapneumonic pleural effusion were retrospectively reviewed from January 2010 to January 2015 in children's hospital of hebei province. All of them were given treated with by antibiotics. The 144 cases of them received central venous catheter closed drainage treatment, and the therapeutic effect was observed.

Results

In the children receiving central venous catheter closed drainage, 139 cases were cured clinically, only 5 cases need surgery. The cure rate was 96.5%.

Conclusions

Central venous catheter closed drainage was an safe and effective method for treating parapneumonic pleural effusion. It is milestone that children with parapneumonic pleural effusion were treated by central venous catheter closed drainage.
The Cerebral Protective Effect of Nebulized Human Recombinant Interferon α1b on Hand-Foot-Mouth Disease Combined with Encephalitis

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Background and aims

To study on the cerebral protective effect of nebulized human recombinant interferon α1b on hand-foot-mouth disease (HFMD) with encephalitis by detecting serum CRP, NSE and S-100B levels in patients.

Methods

100 cases of the HFMD patients with encephalitis were selected in Xi’an children’s hospital from March 2014 to December 2015, randomly divided into IFN-α1b group and conventional therapy group, continuous treatment 5D. Detecting the serum CRP, NSE, S-100B levels by ELISA, then 50 healthy children in Xi’an Children’s Hospital Medical Center were selected as healthy group in the same period.

Results

(1) Compared with the healthy control group, the concentrations of serum CRP, NSE and S-100B in the IFN-α1b group and the conventional treatment group were significantly increased at each testing time point (2) Compared with the conventional treatment group, the concentrations of serum NSE and S-100B decreased significantly in the IFN-1b groups after treatment of 3 and 5 days. However, there was no significant difference in CRP concentration between the IFN-α1b group and the conventional treatment group. (3) Continuous treatment of the IFN-α1b group and the conventional therapy group 5 days, the serum levels of CRP, NSE, S-100B were first increased and then decreased, reaching the peak in 3 days, and the serum levels of NSE, S-100B of the IFN-α1b group were significantly and clearly decreased.

Conclusions

IFN-α1b can protected the brain tissue of the HFMD patients with encephalitis by the inhibitory effect of cytokines and the antiviral effect.
THE RELATED RISK FACTORS OF THE SEVERAL HFMD CHANGE INTO CRITICAL SEVERAL CASES

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Background and aims

To study the risk factors of the several HFMD change into critical several HFMD in children.

Methods

The clinical data of the 200 hospitalized children with HFMD in the second Department of Infectious Diseases from July 2014 to July 2015 in Xi’an children hospital were retrospectively reviewed, including 150 children with several HFMD and 50 children with critical several HFMD. The logistic regression analysis were used to compare the two groups of different clinical manifestations and auxiliary examination results.

Results

Among the two groups, most children are younger than 5 years, especially younger than 3 years (75\% in several group and 90\% in critical several group). The ratio of male and female in the two groups are 2.26:1 and 9.00:1 respectively. Most children in the study have fever and rash. Limb trembling, limb weakness, drowsiness, vomiting, convulsions are common when children are involved in nervous system. According to univariate analysis of logistic regression, we find the risk factors are fast heart rate, fast breath, leukocytosis, high blood sugar, fever, limb trembling/weakness, drowsiness, atypical rash, poor peripheral circulation, improved C-reactive protein and EV 71 positive. Multivariate Logistic regression analysis showed that fast heart rate, pulmonary rales, poor peripheral circulation is an independent risk factor for critical several cases.

Conclusions

The risk factors of the several HFMD change into critical several HFMD are fast heart rate, pulmonary rales and poor peripheral circulation.
CLINICAL AND QUANTITATIVE ANALYSIS ON EPSTEIN-BARR VIRUS INFECTION AMONG 248 HOSPITALIZED CHILDREN WITH HSP
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Background and aims
To study the clinical characteristics of children with HSP, to analyze the relationship between HSP and Epstein-Barr virus infection, to provide a feasibility basis for diagnosis and treatment in the future.

Methods
A retrospective study was performed, the children were divided into four groups: simplex purpura, abdominal-related, kidney-related, joint-related, complex purpura. According to the clinical characteristics, the age of onset, gender, season, EBV load, time of hospital stays and relationship between the clinical characteristics and EBV-DNA copies were studied and analysed.

Results
There were 147 boys and 101 girls in 248 children with HSP. The ages were from 2 to 16 years old, the mean age was 8.89±2.89 years old. There were 4 individuals in the group of toddler's age, 58 individuals in the group of preschool age, 107 individuals in the group of school age, 79 individuals in the group of adolescence. The disease often happen in spring and winter (P<0.05).

The hospital admitted days were from 3 to 43 days, the mean was 10.91±6.64. The hospital admitted days in children with EBV infection more longer than in children without EBV infection (17.12 vs 12.96).

Conclusions
The morbidity of HSP in male children is higher than in female children, and often happen in spring and winter. School children have higher incidence. Hospitalized children with HSP have a high positive rate of EBV infection, and the EBV infection would increase the length of stay in the hospital.
ANALYSIS OF MYCOPLASMA PNEUMONIAE INFECTION AMONG CHILDREN WITH RESPIRATORY TRACT INFECTION IN HOSPITAL IN CHENGDU FROM 2013 TO 2015
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Background and aims

The mycoplasma pneumoniae(MP) infection among children who need to be hospitalized caused by respiratory tract infections in Chengdu was researched and the epidemiological characteristics were analyzed to provide theoretical basis for clinical diagnosis and treatments.

Methods

22,565 cases of children who need to be hospitalized for respiratory tract infections between January 2013 and December 2015 were collected to detect mycoplasma pneumoniae (MP) IgM antibody using indirect immunofluorescence method.

Results

The 2,852 cases of children with MP were tested positive, the total positive rate was 12.64%, 9.59% in male and 17.15% in female. Female children have higher positive rates. The difference was statistically significant (x²=281.341, P<0.05).

The difference about MP positive rate was statistically significant in different ages (x²=1395.788, P<0.05), there was higher MP positive rate in Preschool children series and school children series, 22.91% and 23.08%, respectively. MP positive rate was 14.66% in 2013, 13.18% in 2014 and 10.47% in 2015, the difference was statistically significant (x²=61.915, P<0.05). There was higher MP positive rate from January to March and from September to December (P<0.05) every year. There was no correlation about MP infection and PM2.5 (R=0.336, P>0.05). There was higher MP positive rate in children with bronchial pneumonia and acute bronchitis.

Conclusions

The epidemiological distribution about MP in the children with Respiratory tract infection in Chengdu was relevant with the gender, age, year and month, no relationship with PM2.5; There was higher MP positive rate in children with bronchial pneumonia and acute bronchitis.
EFFECT OF THE USE OF ANTIBIOTICS CONTROLLED BY CLINICAL PHARMACIST IN PATIENTS WITH DIABETIC KETOACIDOSIS (DKA)

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Background and aims

To analyze the effect of the use of antibiotics intervened by clinical pharmacist in diabetic ketoacidosis (DKA) patients.

Methods

The group 1 was not intervened for antibiotics use from January 2010 to November 2012. The group 2 was the intervention group treated from December 2012 to June 2016. Group 1 was divided into group 1a which included newly-onset diabetes patients and group 1b which included long standing diabetes patients. Group 2 was divided into the similar group 2a and group 2b. Clinical pharmacist supervised the implementation of terms to restrict the use of antibiotics. Changes of the rate of antibiotics use, the length of time of antibiotics use, hospital stay, the cost of antibiotics, etc. were compared.

Results

In group 1a and group 2a, the rate of antibiotics use was 85% (107/126) and 31% (58/190) (χ² = 25.787), the length of time of antibiotics use was 11 (7–18) d and 6 (4–10) d (U=1 507), the hospital stay was 23 (18–27) and 20 (6–24) d (U=8 177), the cost of antibiotics was 1 615 (1 000–2 970) and 1 080 (504–1 932) yuan (U=1 783), the differences had statistical significance (P < 0.05). In group 1b and group 2b, the rate of antibiotics use was 97% (33/34) and 48% (23/48) (χ² = 14.222), the length of time of antibiotics use was 8 (6–12) d and 5 (4–7) d (U=180), the hospital stay was 15 (10–21) and 12 (8–16) d (U=580), the cost of antibiotics was 2 200 (1 356–3 100) and 1 600 (705–2 200) yuan (U=223), the differences had statistical significance (P < 0.05).

Conclusions

Clinical pharmacist intervened use of antibiotics was effective in reducing the use of antibiotics and financial burden.
Clinical Value of FibroScan in Liver Fibrosis in Children with Chronic Hepatitis B

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Background and aims

To study the correlation between FibroScan and liver pathology, APRI index, and evaluate the clinical value of FibroScan in liver fibrosis in children with chronic hepatitis B.

Methods

A total of 48 patients with chronic hepatitis B were diagnosed by liver disease center in Hunan Children’s Hospital from June 2016 to June 2017. The APRI (AST / PLT) index was measured within 1 week before liver biopsy And FibroScan detection value LSM, to analyze the differences of pathologic changes of LSM in different degrees of liver fibrosis and the correlation between LSM and liver pathology and APRI.

Results

48 cases of liver pathology results showed that S1 38 cases, S2 7 cases, S3 2 cases, S4 1 case. The results showed that the LSM value increased with the increase of liver fibrosis degree, especially the LSM value of S3 above was significantly increased, the LSM value was statistically significant (P <0.05). The results of Spearman rank correlation analysis showed that LSM was positively correlated with the degree of liver fibrosis (r = 0.81, P <0.05). The APRI index of the patients with different degrees of liver fibrosis was significantly different (P <0.05). The correlation between LSM and APRI index was analyzed by Pearson test. The results showed that LSM was positively correlated with APRI index (r = 0.71, P <0.05).

Conclusions

FibroScan plays an important role in the clinical diagnosis of liver fibrosis in children with chronic hepatitis B and can be used for dynamic observation of long-term changes in liver fibrosis.
INFLUENCE OF MATERNAL INTRA-AMNIOTIC INFECTION ON VERY LOW BIRTH WEIGHT INFANTS

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Background and aims

To estimate the incidence of maternal intra-amniotic infection (IAI) according to gestational age at birth and its impact on neonatal outcome.

Methods

A retrospective cohort study was used to study very low birth weight (VLBW) infants admitted in our hospital between January 2013 to December 2015. Demographic characteristics and adverse outcomes were compared between the IAI exposed infants and non-exposed infants.

Results

In total, 443 VLBW infants were included in this study. There were 132 out of 443 (29.8%) infants exposed to IAI. The incidence of IAI was higher at low gestational age (GA): <32 weeks 36.9%, 32-34 weeks 17.9%, and ≥34 weeks 9.4% (p<0.001). Compared to the control group, the exposed group had significantly higher rates of singletons, diabetes and antenatal antibiotics use (p<0.05), but lower incidences of caesarean delivery, maternal hypertension, fetal distress and IUGR (p<0.05). Compared to the control group, the exposed group had significantly higher rates of BPD, pneumonia and congenital infection, but lower incidence of 5 minute Apgar score ≤7 (p<0.05). The rates of IVH and PVL were higher in the exposed group, but the differences were not statistically significant.

Conclusions

The rate of maternal IAI was negatively correlated with GA at birth. It was associated with higher risks of intraventricular hemorrhage but a lower risk of 5 minute Apgar score ≤7 in VLBW infants. In addition, IAI with more clinical manifestations indicated poorer prognosis of VLBW infants, such as brain injuries and congenital infection.
A CASE OF SEVERE INFECTIOUS ENDOCARDITIS WITH SPLENIC ARTERY DISSECTION
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Background and aims

To explore the treatment of severe infectious endocarditis (IE) with splenic artery dissection.

Methods

We retrospectively analysis one case of severe IE with splenic artery dissection and cerebral infarction in 2016.

Results

One 10 years old boy who experienced ventricular septal defect occlusion surgery at the age of one, presented with left limbs hemiplegia and fever. Streptococcus were positive in two continued blood cultures, Echocardiography indicated IE with two aortic vegetations. Adequate antibiotics were given to the patient, but his family members refused to have heart surgery, after 8 days, he presented with abdominal pain, Echocardiography proved the aortic vegetations were lost, and the enhanced CT prompted splenic artery dissection, emergency splenectomy was conducted for the patient, combined with eight weeks antibiotic therapy, eventually the patient was cured.

Conclusions

Emergency splenectomy maybe the first choice for IE with splenic artery dissection in order to save lives, and enough antibiotic treatments are necessary.
Background and aims

This chapter conducted long-term follow-up study of EV71 HFMD related BE in children, including clinic and MRI study, intelligence assessments, to achieve comprehensive understanding of the patients’ situation and prognosis of children with cognitive function.

Methods

31 patients were randomly called back for clinical assessment, MRI scan, and intelligence assessments during December 2013 to August 2014.

By adopting Mei-Chih Huang classification methods: (1) encephalitis phase ( II Stage) ;(2) of the autonomic nervous dysfunction phase ( IIIa period) ;(3) pulmonary edema phase ( IIIb period) :

Intelligence test: children aged 4 to 6 years old, used Wechsler children intelligence tests (Chinese Version), elder than 6 years, used Wechsler Intelligence Scale for Children (fourth edition).

Results

Of 31 patients, initial study showed that 31 cases’ MRI were positive, follow up study showed that 5 cases’ MRI were positive (with neurological sequel). The neurological sequel included: right upper limb muscle strength grade IV, respiratory dysfunction, irregular breathing or apnea at night, can not sneeze, fuzzy sound.

Verbal IQ scores: II phase 93.1±12.7. IIIa phase 86.5±21.4. IIIbphase82.3±9.5

Full scale IQ scores : II phase 98.6±10.6. IIIa phase 4 91.3±17. IIIb phase 85.2±8

IQ<85 point n(%). II phase 2(21%). IIIa phase 3(38%). IIIbphase 3(43%)

Conclusions

1. The clinical symptoms of the disease in children with EV71 HFMD related BE more severe, the higher the chances of long-term neurological sequelae, the higher the positive rate of MRI.

2. Those brain stem lesions were not completely absorbed, which revealed by long term follow-up study, had cognitive impairment or neurological sequelae.
3. more severe clinical severity, lower scores of language and full scale IQ scores, higher percentage of IQ<85 points, but the difference was not statistically significant (P>IQ 0.05)
BACKGROUND AND AIMS

Hand, foot and mouth disease (HFMD) was spread rapidly and was recognized as a public health problem in recent years in China. Unfortunately, there is no effective vaccine or antiviral drug currently for EV-71 infection. Scavenger receptor class A, member 3 (SCARA3) is a member of the scavenger receptor family.

METHODS

In this study, we found that the expression of SCARA3 was up-regulated in patients with severe symptoms. In this study, we analyzed the mRNA profiles of endangered patients group (n=10) and control patients group (n=10).

RESULTS

We validated 15 genes that were significantly different in patients with E group compared to the controls and further identified that SCARA3 was significantly up-regulated in endangered patients group. This difference was further validated by qPCR assay using another cohort (n=45 for each group).

CONCLUSIONS

We found that SCARA3 is associated with severity of HFMD, and it may be a potential warning sign to predict the HFMD progression.
ANALYSIS OF ETIOLOGY AND CLINICAL CHARACTERISTICS OF 1305 INFANTS WITH FEVER OF UNKNOWN ORIGIN AS THE FIRST SYMPTOM

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Background and aims

Analyzing the etiology and clinical characteristics of infants with fever of unknown origin to provide evidence for diagnosis and treatment.

Methods

The clinical data of hospitalized infants with fever of unknown origin were collected during February 2011 to February 2016 in Beijing New Century Children’s Hospital. All patients were divided into infectious group (the infected sites and etiology include respiratory tract, gastrointestinal, herpes viruses, urinary tract, et al.) and non-infectious group, then compare the etiology, clinical symptoms, age, pathogens, white blood cells, CRP and PCT.

Results

① Infectious diseases were accounted for 84.75% of all infants, while non-infectious diseases were accounted for 15.25%. Among non-infectious diseases, Kawasaki disease was the most common etiology (98.49%). ② Urinary tract infection, lymphatic tissue infection, central nervous system infection and sepsis were more common in the infants less than 3 months old, and herpes virus infection and Kawasaki disease were mainly seen in infants more than 6 months old. ③ Among infants less than 3 months old, fever was the only symptom (46.10%). ④ Herpes virus infection was more common in infants more than 6 months old. Streptococcus agalactiae and staphylococcus epidermidis were the two major pathogens of infants with sepsis and central nervous system infection. ⑤ There was no significant difference in WBC and CRP among the patients with respiratory tract infection, gastrointestinal infection and herpes virus infection (P > 0.05).

Conclusions

Central nervous system infection and sepsis should be identified if the patients with continuously high CRP level, and antibiotics covering streptococcus agalactiae needs to be used early.
Background and aims

Although *mycoplasma pneumoniae* (MP) is a common cause of community-acquired pneumonia in children, the currently used diagnostic methods are not optimal. Proteomics is increasingly being used to study the biomarkers of infectious diseases.

Methods

Label-free quantitative proteomics and liquid chromatography-mass/mass spectrometry were used to analyze the fold change of protein expression in plasma of children with MP pneumonia (MPP), infectious disease control (IDC), and healthy control (HC) groups. Selected proteins that can distinguish MPP from HC and IDC were further validated by enzyme-linked immunosorbent assay (ELISA).

Results

After multivariate analyses, 27 potential plasma biomarkers were identified to be expressed differently among child MPP, HC, and IDC groups. Among these proteins, SERPINA3, APOC1, ANXA6, KNTC1, and CFLAR were selected for ELISA verification. SERPINA3, APOC1, and CFLAR levels were significantly different among the three groups and the ratios were consistent with the trends of proteomics results. A comparison of MPP patients and HC showed APOC1 had the largest area under the curve (AUC) of 0.853, with 77.6% sensitivity and 81.1% specificity. When APOC1 levels were compared between MPP and IDC patients, it also showed a relatively high AUC of 0.882, with 77.6% sensitivity and 88.3% specificity.

Conclusions

APOC1 is a potential biomarker for the rapid and noninvasive diagnosis of MPP in children. The present finding may offer new insights into the pathogenesis and biomarker selection of MPP in children.
CLINICAL CHARACTERISTICS OF PRIMARY EB INFECTION IN CHILDREN IN SHANGHAI
SINGLE CENTER OUTPATIENT CLINIC
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Background and aims

Background and purpose: To describe the clinical features of primary EBV infection in children in Shanghai.

Methods

We retrospective analysis the clinical characteristics of 210 outpatient cases of primary EBV infection in Children’s Hospital of Fudan University during September 2016 to March 2017. The information or data of age, gender, fever, tonsil exudation, eyelid edema, cervical lymphadenopathy, rash and blood routine, liver function, blood smear and EB virus serological test, antibody affinity, PCR-DNA and B ultrasound examination were collected.

Results

The average age of primary EB infection Children in Shanghai was 4.3 years old. There was no significant differences with gender. In the EBV primary infection children, 91.9% had fever, 48.6% with tonsil exudation, 40.5% with eyelid edema, all had cervical lymphadenopathy, only 2% cases had rash. 64.8% of the children had elevated WBC in routine blood test, and 72.9% of the children had abnormal lymphocytes. 45.6% of the children had elevated transaminase and 95.8% cases returned to normal within 35 days. 86.5% of the children were EBV-VCA-IgM positive, and the positive rates of EBV-VCA-IgG, EBV-EA-IgG and EBV-NA-IgG were 83.8%, 29.7% and 0, respectively. EBV-VCA-IgG were low affinity. 37.8% of children with liver and abdominal lymph node imaging abnormalities in B ultrasound.

Conclusions

The age of primary EB infection in children living in Shanghai was relatively young than in west countries. Lymphadenopathy and fever presented in mostly cases who visited doctors. Liver enzyme elevation is common, but we recommended retest should be taken at least 35 days later. Serological test should be the first choice.
A CASE OF DISSEMINATED CRYPTOCOCCOSIS IN CHILD

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Background and aims

A case of disseminated cryptococcosis in child

Methods

A 2-year-old boy presented to our clinic with intermittent fever for 45 days, scalp lesion for 39 days. 45 days ago, he got fever after a cold, without cough, vomiting, diarrhea, joint pain and frequent urination, no treatment. 39 days ago, 3-4 red papules appeared on the head, then increased.

Results

Blood routine examination showed elevated WBC and CRP. He had been diagnosed with skin infections, and treated with cephalosporins and penicillin, but no effect. 15 days ago, he began to cough and sputum, treated with antitussive and expectorant, then it got better. 3 days ago, scalp lesion broke, with purulent exudation. He raised hens at home. On physical examination, small, red papules on the scalp and forehead, some lesions with central dell. Three red plaques with a diameter of 1 cm were seen on the top of his head, the plaques broke down and formed ulceration with bloody-purulent. Blood routine examination: WBC 15.59×10⁹/L, Hb 93g/L, plt 782×10⁹/L, CRP 77mg/L. Latex agglutination test showed positive with 1:1280, all the fungal culture of skin secretions, blood and bone marrow showed Cryptococcus neoformans. Chest radiograph showed widespread patchy dense infiltrations. Thoracoabdominal CT displayed that there were multiple foci of infection in the spleen, Hilar region, retroperitoneal and mesenteric lymphadenopathies.

Conclusions

The diagnosis was disseminated cryptococcosis. The patient was taken with oral flucytosine 0.5g, 4id, and intravenous injection with amphotericin B 10mg/d for 1 month, then the patient got better.
COMPARISON OF CLINICAL FEATURES IN CHILDREN WITH ACUTE LOWER RESPIRATORY TRACT INFECTIONS CAUSED BY RESPIRATORY SYNCYTIAL VIRUS AND HUMAN RHINOVIRUS IN BEIJING, CHINA, 2007-2016
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Background and aims
Respiratory syncytial virus (RSV) and human rhinovirus (HRV) have been recognized as the important viral causes that lead acute lower respiratory tract infections (ALRTIs) in children, especially in infancy and toddler’s age.

Methods
From March 2007 to February 2016, pediatric patients with ALRTIs who presented in emergency department or were admitted to respiratory department or intensive care unit, were recruited for the study. ALRTIs were defined as the presence of signs and symptoms of respiratory tract infection, and lower respiratory signs. The patients were diagnosed with bronchitis, bronchiolitis or pneumonia. Chest X-rays were taken for all patients and the criteria for diagnosing pneumonia are the presence of lung infiltrates indicated by chest radiography. Nasopharyngeal aspirate or throat swab specimens were collected in virus transport media from each patient.

Results
111 cases of 4584 ALRTIs patients were positive for single RSV, 26 cases were detected with single HRV and 46 cases co-infected with both RSV and HRV. Children from single RSV group were younger than the other two groups (RSV-HRV: p=0.001, RSV-CO: p=0.005), both single RSV and co-infected groups needed more oxygen therapy compared to single HRV infected group. When come to the temperature, co-infected group had higher temperature than single RSV infected cases (p=0.004) and was more likely to causing respiratory failure (p=0.019). In terms of diagnosis, co-infection group was easier to be diagnosed with capillary bronchitis.

Conclusions
Meanwhile, the dual infection of RSV and HRV cases were inclined to be continuous wheezing, but have no similar findings between other groups.
LACTOSE INTOLERANCE IN CHILDREN WITH NONTYPHOIDAL SALMONELLA GASTROENTERITIS IN A TERTIARY CHILDREN’S HOSPITAL IN SOUTHERN CHINA
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Background and aims

The aim of this study was to characterize nontyphoidal Salmonella gastroenteritis in a tertiary children’s hospital and evaluate lactose intolerance in children with prolonged nontyphoidal Salmonella gastroenteritis.

Methods

A retrospective case-series analysis was carried out in a tertiary children’s hospital in Guangzhou, China. We included all infants and children who were diagnosed with nontyphoidal Salmonella gastroenteritis between 1 January 2014 and 31 December 2016. Patients’ clinical features, feeding patterns, laboratory tests, and treatment outcomes were reviewed.

Results

A total of 142 infants and children were diagnosed with nontyphoidal Salmonella gastroenteritis. 52.1% of cases occurred in infants ≤12 months of age and the majority (89.4%) in children younger than 3 years old. The most common symptoms were diarrhea (100%), fever (62%) and vomiting (18.3%). Laboratory tests showed that most patients (89.4%) had elevated CRP. Leukocytosis, thrombocytosis and anemia occurred in 42.3%, 40.8% and 36.6% of children, respectively. Salmonella Typhimurium was the predominant serotype, accounting for 82.4%. 91.5% of patients were treated with antibiotics. Forty-one (28.9%) of children improved with a lactose-free formula or diet when diarrhea persisted for more than a week and stool testing was positive for carbohydrate malabsorption.

Conclusions

Most patients with nontyphoidal Salmonella gastroenteritis were younger than 3 years old and main symptoms were diarrhea, fever and vomiting. Salmonella Typhimurium was the predominant serotype. Lactose intolerance occurred frequently in children with nontyphoidal Salmonella gastroenteritis and dietary modification should be considered when diarrhea is persistent and prolonged.
DIFFERENT STAGES OF HISTOLOGICAL CHORIOAMNIONITIS AND NEONATAL EARLY ONSET INFECTIOUS DISEASES

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Background and aims

In order to get a better understanding of the mechanism of neonatal diseases and reduce perinatal morbidity, our study aimed to explore the relationship between different stages of chorioamnionitis and neonatal infectious diseases.

Methods

Data from mothers who delivered in our hospital, accompanied with placental histologic examination, from January 1st 2014 to December 31st 2014 were extracted. Inclusion criteria: delivered in our hospital, both mothers and their neonates had complete clinical data, placental histologic examination. Exclusion criteria: uncompleted clinical data, without placental histologic examination, performed stillbirth. Maternal clinical data and Neonatal clinical information were collected. SPSS (Statistical Package for Social Sciences 22.0) were used for data analysis, a P value <0.05 was considered to be significant.

Results

A total of 994 cases were finally included, and chorioamnionitis was found in 823(82.8%) mothers. Among these 832 mothers, only 275(33.4%) cases had obvious clinical characteristics that could be diagnosed as clinical infection. After adjusted by kinds of maternal characteristics and complications, moderate-severe chorioamnionitis (moderate OR=5.565, 1.696-18.258; severe OR=4.873, 1.302-18.243) was found to increase the risk of neonatal early infectious diseases significantly, while non-chorioamnionitis and mild chorioamnionitis did not. Microorganism that most found in mothers were Escherichia coli, Candida albicans, Coagulase-negative taphylococci. Microorganism that most found in infants were streptococcus mutans, Coagulate-negative taphylococci, Klebsiella pneumonia, Escherichia coli. Bacterial spectrum found in neonates were mostly covered by maternal bacterial spectrum.

Conclusions

Neonatal early onset infectious diseases were strongly associated with maternal infection. Moderate and severe chorioamnionitis could increase the risk of early onset neonatal infectious diseases.
THE LEVEL AND CLINICAL SIGNIFICANCE OF RAB11 IN CHILDREN WITH SEPSIS
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Background and aims
To investigate the expression level of Rab11 in children with sepsis and its relationship with the occurrence and development of sepsis children.

Methods
All cases were divided into experimental group (40 patients) who were diagnosed to have sepsis in pediatric intensive care unit(PICU), and healthy control group (40 healthy children). 2ml of venous blood were collected from children with sepsis at the early, extreme and recovery stage of sepsis. Spearman correlation analysis was used to evaluate the expression levels of Rab11. The expression level of Rab11 in leukocytes of blood samples was measured by Western blot.

Results
The expression level of Rab11 in leukocytes of blood samples from children with sepsis at the early and extreme stage was down-regulated to 0.54 and 0.23 (P< 0.05), while at the recovery stage was recovered to 0.91 when compared with that of healthy control group (P> 0.05). Rab11 expression levels was not correlated with the number count of WBC (r =0.15, P =0.217)、NEUT (r =0.03, P =0.322)、LY (r =0.19, P =0.108)、MO (r =0.08, P =0.756)和EO (r =-0.15, P =0.323) but negatively correlated with CRP (r =-0.58, P =0.014) and PCT (r =-0.63, P =0.003). There was no significant difference in the expression level of Rab11 among severe pneumonia, bronchiectasis and pulmonary infection, biliary tract infection, urinary tract infection, necrotizing enterocolitis and severe enterovirus infection in sepsis at the extreme stage (P> 0.05).

Conclusions
Rab11 plays an important role in the pathogenesis and progression of sepsis in children, and can be used as a predictor of early diagnosis and severity evaluation of sepsis in children.
TREATMENT, DIAGNOSIS AND FOLLOW-UP OF INFECTIOUS MONONUCLEOSIS IN CHILDREN-SINGLE CENTER STUDY
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Background and aims
To investigate the clinical features, diagnosis, the effect of different treatment methods and follow-up results of infectious mononucleosis (IM) in children.

Methods
On the basis of conventional symptomatic treatment, the antivirus group were treated for 7-10 days with ganciclovir or variclovir. Watch projects include: fever duration time, improved angina, lymph nodes, liver, spleen enlargement, heterotypic lymphocyte change, EBV antibody spectrum, EBV DNA and lymphocyte function changes etc.

Results
There was no statistical difference in which duration of fever, improved angina time, lymph nodes, liver, spleen enlargement recovery time, heterotypic lymphocytes returned to normal time, lymphocyte function returned to normal time, EBV antibody conversion between antiviral group and general treatment group, (P > 0.05). There was statistical difference in reducing the serum/plasma or total blood EBV-DNA in the short term between antiviral group and general treatment group (P < 0.01). But for the long-term reduction of EBV-DNA, there was no statistical differences (P > 0.05). CD8+ T cells increased obviously while CD4 + T lymphocyte and NK cell was normal or slightly elevated and B lymphocyte was decreased significantly after EBV infection, but there was no statistical difference between two groups.

Conclusions
IM was more common among preschool children, and frequently occurred in summer and autumn, the main clinical manifestations were fever, angina, lymphadenopathy, eyelid edema, hepatomegaly, splenomegaly and. EB virus infection caused by CD8+ T lymphocytes increased significantly and B lymphocytes decrease significantly.

Therefore, for general IM patients, is not recommended special antiviral treatment.
DISTRIBUTION AND DRUG RESISTANCE OF 350 STRAINS OF HAEMOPHILUS INFLUENZAE ISOLATED FROM CHILDREN
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Background and aims
To study the clinical distribution and drug resistance of Haemophilus influenzae in children, and to guide clinical rational drug use

Methods
from 2014 to 2016 in our hospital clinical samples were isolated, the distribution of 350 strains of Haemophilus influenzae beta lactamases and drug sensitivity were analyzed retrospectively. The drug sensitivity test was performed by disk diffusion method, and the paper method was used to detect beta lactamase, and the results were tested according to the standards of clinical and Laboratory Standards Association (CLSI) in 2014. Statistical analysis of data using WHONET 5.6 and SPSS 15.0 software.

Results
Haemophilus influenzae infection was more common in infants and young children. The positive rate of beta lactamase was 53.1%, resistance to Trimeghoprim-Sulfamethoxazole the highest rate of 76.9%, to ciprofloxacin, chloramphenicol, tetracycline, ceftizoxime, amoxicillin / clavulanic acid, cefuroxime, cefaclor, azithromycin and ampicillin sensitive rates were 99.1%, 98.9%, 95.4%, 88.3%, 87.7%, 74.9%, 65.4%, 56.6%, 46% not detected, to ceftriaxone, Luo Pei south is not sensitive to the beauty of Haemophilus influenzae. Luo Pei South Beauty ceftriaxone, insensitive to Haemophilus influenzae.

Conclusions
the positive rate of Haemophilus influenzae beta lactamase - from children is very high, is the main mechanism of Haemophilus influenzae resistance to ampicillin, its high enzyme characteristics make ampicillin can not be used as a first-line treatment. The drug resistance of Haemophilus influenzae was the highest, and the most sensitive to beta lactam antibiotics was ciprofloxacin, followed by chloramphenicol.
THE COMPARISON OF CLINICAL ANALYSIS IN CHILDREN OF DIFFERENT AGE WITH LOBAR PNEUMONIA INFECTED BY MYCOPLASMA PNEUMONIA

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Background and aims

To analyze the clinical characteristics of different ages with lobar pneumonia infected by Mycoplasma pneumonia.

Methods

The clinical features and treatment outcomes were analyzed in 30 children under 3 years old and compared with 163 children more than 3 years old.

Results

MPP was the highest in winter. The rate of lobar pneumonia in older than three years group is 84.5% which was significantly higher than under 3 years old group (p<0.05), but no significant difference. Compared with children more than 3 years old, in children under 3 years old, the number of cases with Phlegm cough, wheezing, dyspnea and pulmonary dyspnea was higher, PCT increased more (p<0.05). More than 3 years old group in fever, the history of fever, elevated CRP, progress of refractory Mycoplasma pneumoniae pneumonia and hormone use rate is higher, but no significant difference (p>0.05). The right lower lobe was the most common lesions in Chest CT. Electrolyte disorder, liver function damage and rash can be found in both groups. Early acceptance of electronic bronchoscopy can shorten the course of disease and reduce the sequelae.

Conclusions

Children with lobar MPP often presented severe clinical symptoms, the incidence of pulmonary and extrapulmonary implications were higher; Early electronic bronchoscopy lavage can improve the prognosis. Mycoplasma pneumoniae lobar pneumonia in children under 3 years old had the characteristics of Phlegm cough, wheezing, dyspnea. light systemic inflammations and less pulmonary sequelae.
THE EXPRESSION AND SIGNIFICANCE OF OAS1 GENE IN CHILDREN WITH HAND FOOT AND MOUTH DISEASE

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Background and aims

To investigate the expression of 2'-5'oligoadenyl synthesis (OAS1) gene in the development of children with hand, foot and mouth disease (HFMD)and its significance in the diagnosis and treatment of HFMD.

Methods

Fifty-eight children with HFMD and 29 children with severe hand, foot and mouth disease were selected as the subjects. The patients were divided into HFMD group and severe HFMD group, the peripheral blood of them was collected with 2ml; with children recovered after discharge, the peripheral blood was collected again after children with HFMD were cured, and they were set as rehabilitation group. Extracted RNA and DNA, the expression of OAS1 mRNA and protein was detected by RT-PCR and Western blot respectively.

Results

The expression of OAS1 mRNA and protein in HFMD group and severe HFMD group was significantly higher than that in normal control group (p <0.05). The expression of OAS1 mRNA and protein in severe HFMD group was higher than that in HFMD group, and the difference was statistically significant (P <0.05). The expression of OAS1 mRNA and protein in rehabilitation group was significantly lower than that in HFMD group and severe HFMD group (p <0.05), which was slightly higher than that in normal control group (p <0.05)

Conclusions

OAS1 gene may play an important role in the pathogenesis of hand, foot and mouth disease, and may be one of the important indexes for the severity of hand, foot and mouth disease, and may provide a new target for the treatment of hand, foot and mouth disease.
CLINICAL SIGNIFICANCE OF PLATELET PARAMETERS IN CHILDREN WITH SEVERE MYCOPLASMA PNEUMONIA

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Background and aims

To analyze the clinical significance of platelet function status in children with severe mycoplasma pneumonia.

Methods

The medical records of 90 children with mycoplasma pneumonia (including 60 cases of severe pneumonia, 30 cases of mild pneumonia) and 30 cases of healthy control group. The changes of platelet parameters including platelet count (PLT), platelet distribution width (PDW), mean platelet volume (MPV), platelet hematocrit (PCT) and large platelet ratio (P-LCR) were measured and compared in the first day of admission in hospital (acute phase) and the day before discharge.

Results

In acute phase, PLT of the severe group, the mild group and the control group were 243.5±11.70, 332.13±95.25, 287.40±36.90 respectively. PLT of severe group was significantly lower than those of the mild group and control group while the PLT of mild group was significantly higher than that of control group. PDW of the severe group, the mild group and the control group were 10.74±3.03, 10.58±1.57, 12.89±2.77, respectively. The PCT of the severe group, the mild group and the control group were 0.26±0.01, 0.27±0.07, 0.28±0.05; The MPV of the severe group, the mild group and the control group were 9.35±0.77, 9.64±0.84, 9.64±1.02, respectively. P-LCR of the severe group, the mild group and the control group were 21.74±6.02, 21.37±7.01, 21.71±6.62, respectively.

Conclusions

Determination of platelet parameters in children with mycoplasma pneumonia can identify severe mycoplasma pneumonia in early stage and help to determine the condition changes. The reduction of PLT gives us a hint for the diagnosis of severe mycoplasma pneumonia, and mostly in the acute phase.
 CLINICAL CHARACTERISTICS OF BLOODSTREAM INFECTIONS IN PEDIATRIC ACUTE LEUKEMIA: A SINGLE-CENTER EXPERIENCE WITH 231 PATIENTS

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Background and aims

Acute leukemia is the most common pediatric hematological malignancy. Bloodstream infections (BSIs) are severe complications in these patients during chemotherapy. This study aims to explore the clinical presentation and etiology of BSI, as well as the common sites of infection, and to provide a basis for the rational regarding antibiotic use.

Methods

We performed a retrospective chart review of all pediatric patients who had acute leukemia accompanied by a bloodstream infection in our hospital from December 2011 to September 2015. All patients were selected based on clinical presentation and had to have at least one positive blood culture for inclusion. The basic clinical characteristics, blood culture results, and antimicrobial susceptibilities were analyzed.

Results

All 231 patients had a fever; of them, 12 patients continued to have a fever. Twenty-five patients had non-remitting (NR) leukemia, and 206 patients achieved complete remission (CR). Differences in the duration of fever between the NR and CR groups were significant (9.6 ± 7.9d vs 5.1 ± 3.8d, P=0.016). One hundred eighty patients had agranulocytosis. Differences in fever duration between the agranulocytosis and non-agranulocytosis groups were significant (6.2 ± 5.1d vs 4.1 ± 2.6d, P=0.001). The other sites of infection in these 231 patients were the lung, mouth, digestive tract, and rectum. Blood culture samples comprised 2635 samples. There were 619 samples that were positive. Of the 619 positive blood culture samples, 59.9% had gram-negative bacteria, 39.3% had gram-positive bacteria, and 0.8% had fungus. The primary pathogens were Pseudomonas aeruginosa, Enterobacter cloacae, Escherichia coli, and Klebsiella pneumoniae. Of these 231 patients, 217 patients were cured.

Conclusions

Gram-negative bacteria were the main pathogenic bacteria in patients with acute leukemia in our center. NR primary illness, agranulocytosis, and drug-resistant pathogenic bacteria were all risk factors for poor prognosis.
Background and aims

The clinical data of patients with herpangina in 2015 was analyzed, to provide a theoretical basis for the reasonable diagnosis and treatment of herpangina.

Methods

Inflammatory index, biochemical index, immune function and blood culture were tested in 190 children with herpangina hospitalized in Qilu Children’s Hospital of Shandong University in 2015. Enteric viruses in throat swab samples of the patients were detected by Real-time PCR.

Results

The cases include 107 males and 83 females, at the age of 4 months and 10 days to 9 years and 4 months. The prevalence of herpangina was highest among May to August. In addition to fever and pharyngeal isthmus herpes, the clinical manifestations included convulsions in 19 cases, encephalitis in 23 cases, acute bronchitis in 17 cases, pneumonia in 7 cases, sepsis in 1 case, diarrhea in 1 case and suppurative tonsillitis in 2 cases. All the patients were cured and discharged. Peripheral blood white blood cells increased in 82.6% cases. CRP increased in 82.9% cases. Myocardial enzymes were more than 2 times higher in 45.3% cases. CD4 T lymphocyte subsets decreased in 88.4% cases. Blood culture were tested in 142 patients, all of them were negative. Throat swabs PCR were positive in 120 of 148 cases, and the positive rate was 81.08%.

Conclusions

Increased peripheral blood white blood cell count and CRP in early stage is not a sign of bacterial infection. Pathogenic examination should be performed as early as possible, so as to avoid the abuse of antibiotics.
THE VALUE OF SERUM AMYLOID A FOR EARLY DIAGNOSIS OF INFECTIOUS DISEASES IN CHILDREN

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Background and aims

The purpose of this study was to research the value of serum amyloid A for early diagnosis of infectious diseases in children.

Methods

250 children aged from 2 months to 12 years old were enrolled into this study. The serum levels of serum amyloid A (SAA), C-reactive protein (CRP) and peripheral blood leukocyte count (WBC) were determined in all children, including 96 children with virus infection, 92 children with bacterial infection and 62 healthy children. The diagnostic efficacies of these indicators were analyzed.

Results

Compared with healthy control group, the levels of SAA, CRP, WBC, SAA/CRP in bacterial infection group were all significantly higher (P < 0.001), the levels of SAA, SAA/CRP in virus infection group was significantly higher (P < 0.001). Compared with viral infection group, SAA, CRP, WBC in bacterial infection group were statistically higher (P < 0.001). The area under the ROC curve (AUC) of SAA, CRP, WBC, SAA/CRP for the diagnosis of bacterial infection and virus infection was respectively 0.938, 0.882, 0.802, 0.882 and 0.872, 0.573, 0.568, 0.573.

Conclusions

SAA is of high diagnostic value for viral and bacterial infection. CRP is of high diagnostic value for bacterial infections, but the diagnostic value of virus infection is limited. The WBC combined SAA, CRP detection can provide valuable laboratory basis for the diagnosis and differential diagnosis for bacteria and virus infection in children.
CLINICAL ANALYSIS OF LIVER INJURY INDUCED BY EV71 INFECTION

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Background and aims

To summarize the clinical characteristics of liver injury of children with EV71 infection, discuss the intervention measures, and evaluate its prognosis.

Methods

The clinical data of 206 patients with abnormal liver enzymes and 690 patients with normal liver enzymes were analyzed. Two groups of patients were all given treatment as antiviral, anti-inflammatory, reduce intracranial pressure, protect brain cells; patients with liver enzyme abnormal were given reduced glutathione to protect liver cells. After treatment 5 days, review liver enzymes, if patients with abnormal liver enzyme continuing to treatment.

Results

The sex ratio was no obvious difference between normal and abnormal liver enzyme group. 206(23.7%) abnormal liver enzymes cases in EV71 infection severe cases, ALT was 145 ± 25 u/L, 5 cases were more than 400 u/L, 2 cases with blood coagulation dysfunction, 126 cases with mild nausea and vomiting, 2 cases with diarrhoea, 18 cases with liver enlargement. After 5 days, 86(41.7%) cases ALT became to normal, others with different decline in ALT. 98.3% cases ALT became to normal in 10 days. 68 cases developed into very severe, 13(19.1%) cases have abnormal liver enzymes, 5 cases in which were significantly higher in ALT. But finally, all cases were cured and leave hospital.

Conclusions

The gastrointestinal symptoms are mild and few, and its prognosis is positively correlated with the extent of liver damage. Generally, the treatment of protect liver is effective, and the prognosis is good. Most recovered within two weeks.
Background and aims

To retrospectively study the clinical features and prognosis of Wilson’s Disease with hepatic failure complicated with hemolytic anemia in children.

Methods

9 patients with Wilson’s Disease diagnosed as hepatic failure complicated with hemolytic anemia were included from January 2005 to December 2016.

Results

1.9 patients were aged 7.5-16 years (median 9), and 7 females, of all with no family history. 7 cases had no inducement, besides 1 cases because stop excretion drugs, 1 cases due to ate a lot of seafood. 2. clinical manifestations: all were jaundice, physical examination: severe jaundice, anemia; splenomegaly in 5 cases, liver enlargement in 2 cases. 4 cases with hepatic encephalopathy, 2 cases complicated with digestive tract bleeding. 3. laboratory results: TBIL fluctuated 303-1043.8umol/L, ceruloplasmin was 100-150mg/dL, 24 hours urine copper: 824.4-3275ug. Abdominal ultrasound: cirrhosis and splenomegaly (100%, 9/9), 66.67% (6/9) of all had multiple gallbladder stones. 100% (7/7) of all eyes examination were positive for KF ring. 2 cases pathological diagnosis were Wilson’s disease. All of cases the prognostic index scores of Wilson’s disease were 11 points. 4. prognosis: only 1 patients were improved after hormone, plasma exchange and medical treatment. The prognosis index of the case was lowest.

Conclusions

the patients with Wilson’s disease in liver failure patients with hemolysis ceruloplasmin may only slightly lower than normal, the diagnosis should be combined with the KF eye ring and 24 hour urine copper examination. Liver transplantation was necessary because of poor prognosis.
STREPTOCOCCAL TOXIC SHOCK SYNDROME IN CHILDREN CAUSED BY GROUP A STREPTOCOCCUS: A REPORT AND BRIEF REVIEW OF LITERATURES

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Background and aims

To investigate the clinical manifestation, treatment and prognosis of streptococcal toxic shock syndrome (STSS) in children caused by group A streptococcus (GAS).

Methods

Clinical manifestation, treatment and prognosis of STSS caused by GAS in a child were analyzed in Children’s Hospital of Fudan University. Using “streptococcal toxic shock syndrome” “children” and “case report” as Keywords, literatures were searched from Pubmed database and Chinese database of Weipu, Wanfang and in the China National Knowledge Infrastructure (CNKI) from January 1996 to May 2017.

Results

(1) A 11 years old girl complained of once convulsion with fever, right leg swelling and pain for 3 days, diagnosed with the right thigh hemangioma in the past 10 years. Upon arrival at the paediatric intensive care unit (PICU) on January 19, 2015, her blood pressure was 115 / 45mmHg, and large tracts of erythema can be seen on the right side of the lower limbs. She was immediately treated with fluid expansion, 3 times continuous renal replacement (CRRT) and empirical antibiotics. We performed two punctures on the right thigh abscess. The results were GAS. She was transferred to a regular room 10 days later, antibiotics downgraded to ceftriaxone combined with penicillin, which were given for 1 week. The patient was discharged 14 days after admission, and was given oral antibiotics with cephalosporin for 2 weeks. There were five reports in Weipu, Wanfang and CNKI databases.

Conclusions

STSS is a rare and severe form of invasive streptococcal infection in children, which early manifestations with non-specific. Pediatricians should keep alert on STSS, early identification, timely diagnosis, and adequate treatment are the key to improving the prognosis.
CASE REPORT OF MISDIAGNOSIS OF MYCOPLASMA PNEUMONIAE PNEUMONIA COMPLICATED WITH STEVENS-JOHNSON-SYNDROME
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Background and aims

Mycoplasma pneumoniae (Mp) is a common pathogen of community-acquired pneumonia (CAP) in children. Epidemics of Mp occurred in China in recent years. Mp infection may cause multisystem damage and the extrapulmonary manifestations are easily to be ignored or misdiagnosed. Here, we report a case of Mp pneumonia complicated with Stevens-Johnson-syndrome (SJS), which was ever misdiagnosed as chicken-pox.

Methods

To review the process of diagnosis and treatment of one child aged 9 whose final diagnosis was Mp pneumonia complicated with SJS

Results

A boy aged 9 was admitted because of fever, cough and oral ulcer. 16 hours after admission, papules with obvious pruritus appeared on the face and trunk. And the papules developed rapidly into herpes. Then the boy was transferred to the infectious hospital, since chicken-pox was suspected. However, the rash still exacerbated after antiviral therapy and fever was continuous. Therefore, the boy was diagnosed as Mp pneumonia complicated with SJS. Withdrawing the beta-lactam-antibiotics, using prednisolone and azithromycin, he recovered gradually and discharged in the end after almost 1 month since the onset of disease.

Conclusions

Mp infection may involve extrapulmonary organs. SJS is a severe presentation of the skin. Clinicians should be aware of the extrapulmonary symptoms of Mp infection, avoid the administration of beta-lactam-antibiotics to prevent severe complications of the skin or mucosa if there was any signs, and treat the complication as soon as possible.
HADV-3 AND HADV-7 LEADS TO CENTRAL NERVOUS SYSTEM CHANGE BY DIFFERENT PATHWAYS
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Background and aims

To investigate the differences and mechanism of central nervous system disease caused by HADV-3 and HADV-7.

Methods

1. Children with acute lower respiratory tract infections (ALRTIs) that were treated at the Department of Respiratory Medicine at the Children’s Hospital of Chongqing Medical University in China between June 2009 and May 2014 were enrolled in the study, and nasopharyngeal aspirate (NPA) samples were collected when the patients were admitted to our department. The viral DNA was extracted from NPA samples. Polymerase chain reaction (PCR) was used to detect HADV, and gene sequencing was also used to identify the HADV subtype.

2. HADV-3, HADV-7 were isolated and used to infect A549 cell line with the same virus titer. The TCID50 values were determined at different time points to draw growth curve.

Results

1. 4678 NPA samples were collected from June 2009 to May 2014, and 288 samples (6.00%) were HADV-positive. The HADV-7 detection rate was 45.90% (129/281) while HADV-3 was 43.41% (122/281). Besides, 29 HADV-positive patients were diagnosed with toxic encephalopathy meanwhile. Among which, the HADV-7 and HADV-3 detection rate was 17.80% (23/129) and 1.60% (2/129).

Conclusions

The incidence of toxic encephalopathy caused by HADV-7 was higher than HADV-3. HADV-3 resulted in viral encephalitis while HADV-7 caused toxic encephalopathy by releasing inflammation cytokine. In clinical work, the treatment of toxic encephalopathy caused by HADV-7 should be focused on blocking inflammation response, while the treatment of viral encephalitis caused by HADV-3 would be mainly about stopping the virus from replicating.
HSV-2 INFECTION ENHANCED HPV16 E6/E7 EXPRESSION VIA JNK PATHWAY, WHICH MIGHT AFFECT CERVICAL CANCER PROGRESSION
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Background and aims

HSV-2 has been considered as a co-factor for HPV-induced cervical cancer, but the detailed mechanism has not been elucidated.

Methods

Our experiment results showed that HSV-2 infection could activate the transcription activity of HPV16 early promoter P97, up-regulate the expression of carcinogens E6/E7 at both mRNA and protein levels and decrease the expression of the tumor supressor p53.

Results

In addition, HSV-2 infection enhanced the transcriptional activity of HPV16 P97, which could be blocked by the JNK specific inhibitor. Based on these results, we hypothesized that HSV-2 infection might modulate HPV16-induced cervical cancer progression through up-regulation of E6/E7 expression via JNK pathway. Therefore, this proposed study aims to investigate in-depth the molecular mechanism underlying HSV-2-enhanced the E6/E7 expression as well as its implications in HPV16-induced cervical cancer progression.

Conclusions

The anticipated outcome of this proposed study would provide valuable information for understanding the significance of HSV-2 in the etiology of cervical cancer.
IMPACT OF RESPIRATORY SYNCYTIAL VIRUS LOAD ON THE CLINICAL SEVERITY OF INFANTS WITH ACUTE LOWER RESPIRATORY TRACT INFECTIONS

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Background and aims

Human Respiratory syncytial virus (HRSV), having two subtypes A and B, is believed to be the most common viral pathogen causing acute lower respiratory tract infections (ALRTI) in infants. The correlation between the RSV load and disease severity remains controversial. The aim of this study was to further assess the relationship between RSV load and ALRTI severity.

Methods

Infants under two years old and diagnosed with ALRTI were recruited during the RSV season from 2016 November to 2017 March. Nasopharyngeal aspirates (NPAs) of outpatient were collected when they visited doctors.

Results

A total of 457 and 38 infants were recruited in outpatient and inpatient groups, respectively. 275 (60.2%) outpatients were detected RSV as solo pathogen of virus by IFA. RSV-positive group were more with fever (P < 0.01) and wheeze (P < 0.001) than the negative group. The hospitalization rate of outpatient infants was 11.0% (48/435). Compared with outpatients, the age of inpatients group was smaller, boys were more, and the viral load is higher (P < 0.001). The peak of RSV load of inpatient was observed upon admission and decreased significantly over time. Clinical scores declining with the passage of course was consistent with the RSV loads decreasing, the correlation between viral load and RSV-infection severity was significant.

Conclusions

RSV-infected children are easier to present the symptoms of fever and wheeze. The younger and boys are more likely to suffer from severe RSV infection. For inpatient children, the RSV load and dynamic changes are both associated with disease severity.
TAENIAASIATICA WAS DETECTED BY NEXT GENERATION SEQUENCING IN A CSF SAMPLE OF BACTERIAL MENINGITIS PATIENT
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Background and aims

Next generation sequencing (NGS) is the catch-all term used to describe a number of different modern sequencing technologies which provide a new way for the research and diagnosis of infectious diseases.

Methods

We use NGS to test cerebrospinal fluid of a bacterial meningitis patient.

Results

A 14 year-old boy was admitted to hospital because of fever, headache and vomiting for day. He had neck stiffness and positive Babinski sign on examination. White blood cells count was 4 percubic millimeter in cerebrospinal fluid, with 90% neutrophils, protein 2852mg/L, glucose 0.02mmol/L. Contrast-enhanced MRI presented brain parenchyma nodule with enhancement. Staphylococcus aureus grew in blood culture, and then bacterial meningitis was diagnosed. Vancomycin and ceftriaxone were administered for 2 weeks and the patients got recovered. He was healthy previously with no risk factor. NGS of cerebrospinal fluid was carried out retrospectively thirteenth days after the disease onset, showed Taeniaasiatica infection, subsequently proven by Sanger sequencing.

Conclusions

We think Taeniaasiatica was not the reason of the disease this time because we do not treat accordingly, the boy was recovered and nodules in brain was decrease. Bacteria were not detected in NGS, maybe because of the rapid and effective antibiotic treatment and the sample was from the late stage of the disease. The application of NGS can improve pathogenic diagnosis of infectious diseases due to its wide-ranging pathogen detection ability. However, the interpretation of the data is sometimes difficult and needs more consideration from the patient’s clinical situation.
THE DYNAMIC STUDIES OF THE PCT, IL-6 AND D-D IN THE EARLY DIAGNOSIS IN CHILDREN
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Background and aims

To studies the dynamic studies of the PCT, IL-6 and D-D in the early diagnosis of sepsis in children

Methods

Selected 45 cases children patients in Pediatric Intensive Care Unit from 10.2014-09.2015 (male=29, female=16), and selected 48 cases children patients in Pediatric Surgery as the control, test the standard of PCT, IL-6 and D-D in the plasma in 30min, 6hr, 24hr.

Results

Compare the level of PCT, IL-6 and D-D of the observation group in treatment in 30min, 6hr, 24hr. there are significantly increased. And compared with the control group, the differences was statically significant (P<0.05). The level of PCT in the observation group is highest in 6hr inpatient and gradually decreased with the treatment. While the level of IL-6, D-D reached the maximum in 24hr after admission. There was no significant correlations between the level of PCT, IL-6, and D-D and the treatment (P>0.05).

Conclusions

The examination of PCT, IL-6, and D-D and plasma might be of great help to the early diagnosis of sepsis children.
EFFECTIVENESS OF CHINESE MEDICINE COMPOUND RECIPE COMBINED WITH ANTIBIOTICS IN CHILDREN WITH ACUTE COUGH

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Background and aims

To assess the efficacy of Sangxingerchen granule combined with antibiotics in children with acute cough.

Methods

Totally 288 patients with acute cough (aged 1-14 years) admitted to department of pediatrics of ****hospital from March 2015 to March 2017 were enrolled. The subjects were treated with Sangxingerchen granule combined with antibiotics (combined medication group, n=158) or only treated with antibiotics (western medication group, n=130) according to the will of patients and their parents. Then, the course of antibiotics treatment, the category of antibiotics, the days of intravenous antibiotics were recorded and compared between the two groups. The recurrence rate of acute cough during the following 3 months were also observed and compared.

Results

The days of antibiotics use, the days of intravenous antibiotics in combined medication group were significantly less than that of in western medication group (P < 0.01). There were less patients using two kinds of antibiotics in combined medication group compared with western medication group (P < 0.05). The recurrence rate of acute cough was significantly lower in combined medication group than in western medication group during the following 3 months (P < 0.01).

Conclusions

Sangxingerchen granule combined with antibiotics could reduce antibiotics usage in children with acute cough. Meanwhile, the risk in recurrence of acute respiratory infections was also decreased in near future.
THE STUDY ON CLINICAL AND PATHOLOGIC FEATURES IN CHILDREN WITH CHRONIC HEPATITIS B OF DIFFERENT AGE RANGES
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Background and aims
To investigate the clinical and pathologic features in children with chronic hepatitis B (CHB) of different age ranges.

Methods
There were 66 cases of children who were diagnosed chronic hepatitis B and had liver biopsy in Liver Center of Hunan Children's Hospital from July 2010 to June 2016. Four items of hepatic fibrosis, HBV-DNA levels, and 5 markers of hepatitis. According to different age ranges, these patients were divided into >6 years old group, 6~12 years old group, <12 years old group, compare with different groups with serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), total protein (Ab), III collagen (PCIII), laminin (LN), hyaluronidase (HA), IV collagen (IVc) content and HBV-DNA level.

Results
There are 34 cases in >6 years old group, 20 cases in 6~12 years old group, 12 cases in <12 years old group, compared between 3 age groups, there were no significant differences between the two groups with ALT, AST, PC, LN, HA, IVc. (P >0.05). HBV-DNA load level between the two groups (P =0.003) the difference was statistically significant, for > 6 years (34 cases) and <6 (32 cases) were compared, the difference of 5 markers of hepatitis was statistically significant (P =0.017, P<0.05), and, the difference of liver histology was statistics significant difference (P =0.001, P<0.05).

Conclusions
In CHB children, with age increased, the level of HBV-DNA load decreased, liver tissue inflammation increased, hepatitis B serological indicators were converted, and no significant increase in the degree of liver fibrosis, which has an important role for the guidance of diagnosis and treatment of CHB children.
Background and aims

To investigate the nosocomial infection/colonization clinical features and drug resistance of Elizabethkingia meningoseptica (EME) and Enterobacteriaceae in the pediatric intensive care unit (ICU) in the lower respiratory tract and blood, to provide reference for the reduction of nosocomial infection and rational use of antibiotics.

Methods

The nosocomial infection/colonization clinical features and drug resistance of EME and Enterobacteriaceae in the ICU of our hospital from 2016.1-2016.12 were analyzed retrospectively.

Results

There were 1595 patients in ICU of 2016, the rate of nosocomial infection/colonization in EME (3.26%) was higher than that of Enterobacteriaceae (1.76%) in the lower respiratory tract and blood (P<0.05). The proportion of trachea intubation with EME is higher than that of Enterobacteriaceae bacteria. EME showed multiple resistance to various antibiotics, including cephalosporins and carbapenems, and the resistance was more severe than Enterobacteriaceae.

Conclusions

The rate of nosocomial infection/colonization in EME is higher than that in Enterobacteriaceae, and the drug resistance is more severe in EME.
2 CASES OF DUAL INFECTIONS OF THE CENTRAL NERVOUS SYSTEM CAUSED BY EPSTEIN-BARR VIRUS AND STREPTOCOCCUS PNEUMONIAE

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Background and aims

Streptococcus pneumonia (SP) is one of the most common pathogens of bacterial meningitis. Epstein-Barr virus (EBV) is the most frequent agents found in the CNS in association with other microorganisms. In immunocompetent patients, EBV and SP dual infections are uncommon. To summarize characteristics of dual infection in CNS caused by EBV and SP.

Methods

We describe clinical, laboratory characteristics and MRI of 2 patients with central nervous system (CNS) infection caused by EBV and SP.

Results

2 patients are both toddler period, both female and male can attack. They are immunocompetent. The initial symptom is fever, and no infectious mononucleosis clinical manifestations. The EBV load was 10^3/ml. 1 case of blood culture was SP, 1 case of blood and CSF cultures were SP. MRI performance for demyelinating lesions, and the hospitalization time more than 30 days.

Conclusions

Coinfection in CNS caused EBV and SP tend to be demyelinating. It should be considered coinfection of EBV if SP meningitis cases were not treat effectively.
DETECTION AND CHARACTERIZATION OF BACILLUS CEREUS GROUP IN AN INFANT WITH MENINGITIS BY METAGENOMIC SEQUENCING
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Background and aims

Meningitis is a serious disease with high morbidity and mortality and diagnosis of infectious meningitis such as culture-dependent are time consuming with a low sensitivity.

Methods

A sample of cerebrospinal fluid (CSF) was collected from a young infant with meningitis. Cell-free nucleic acids in CSF were extracted and the metagenomic sequencing was performed on Miseq platform and HiSeq X Ten platform respectively.

Results

The phylogenetic analysis indicated that the potential pathogen might be B. cereus or B. thuringiensis. The alignment to CARD database showed 6 reads matched to B. cereus beta-lactamase II gene with the highest coverage of 41%. A deep metagenomic sequencing was introduced to confirm the identification. A total of 78,602,823 sequence reads derived from the patient’s CSF sample with 53.89% of which were from the patient and 40.19% unknown. About 2.12% of the total sequence reads matched to the B. cereus group genome in the reference database, which was consistent with the results yielded in rapid identification. Phylogenetic analysis based on SNP calling form whole-genome of the select strains also confirmed that the CSF sample harbored a strain in B. cereus group.

Conclusions

The strain in B. cereus group close to B. cereus and B. thuringiensis with the presence of two beta-lactamase genes were identified as potential pathogen from the patient’s cerebrospinal fluid. Such next generation sequencing detection may serve as a practical diagnosis tool for rapid pathogen identification facilitating targeted antimicrobial therapy.
DETECTION OF MYCOPLASMA PNEUMONIAE IN NASOPHARYNGEAL SWAB SAMPLES COLLECTED FROM CHILDREN WITH ACUTE RESPIRATORY INFECTIONS BY FLUORESCENCE LOOP-MEDIATED ISOTHERMAL AMPLIFICATION

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Background and aims

Objective: To establish a method of fluorescence loop-mediated isothermal amplification for rapidly detecting Mycoplasma pneumonia (MP) in nasopharyngeal swab samples collected from children with acute respiratory infections.

Methods

According to the repeat sequence SDC1 of MP genome, special primers for fluorescence LAMP were designed and the method for detecting MP DNA was developed. Sensitivities of the fluorescence LAMP primers was tested using MP type strain FH DNA, and specificity was evaluated through cross-reaction with other Mycoplasmas and bacterial DNAs. To tested the reliability of the method, nasopharyngeal swab samples was detected by the fluorescence LAMP and real-time PCR, respectively.

Results

The sensitivity detection results showed that the fluorescence LAMP could detect 6 copies of FH DNA, and no amplification was shown in DNA of other mycoplasma or bacterials. For clinical specimens, the total consistency rate of fluorescence LAMP, the total consistency rate of real-time PCR was 96.4%.

Conclusions

fluorescence LAMP should be very useful for the rapid detection of MP in clinical diagnosis of MP infection.
INVASIVE CANDIDIASIS IN AN 11-YEAR-OLD BOY WITH CARD9 DEFICIENCY
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Background and aims

Invasive candidiasis is a severe and sometimes life-threatening fungal infection. It comprises both candidemia and deep-seated tissue candidiasis, characterized by hematogenous dissemination or direct inoculation of candida species to a sterile site. The disease mainly affects patients with known immunosuppression, but it may also present in those with primary immunodeficiency arising from unknown genetic defects. Invasive candidiasis of the CNS is rare, but an elevated incidence in CARD9-deficient patients has been observed, possibly because of impaired neutrophil recruitment to the site of infection due to the lack of chemoattractants.

Methods

We studied the clinical features of invasive candidiasis (CNS, vertebral spine and knee joint) in an 11-year-old boy with no known immunodeficiency. He presented with multiple bone destructions, recurrent fever, irritability and blurred vision. Biopsy and exudate culture confirmed the growth of Candida albicans. MRA scan of the brain showed cerebral vasculitis, which is rare in the case of CNS infections. Anti-fungal treatment was effective. In search for a cause of the susceptibility, gene sequencing of 6110 genetic diseases was performed.

Results

The results showed an inherited compound heterozygous CARD9 mutation (c.246C>A and c.1497delT) that has never been reported before. Both mutations were predicted to be pathogenic.

Conclusions

Invasive candidiasis in patients without known immunosuppression merit evaluation for CARD9 deficiency. Patients with CARD9-associated Candida infections require thorough testing, including CSF analysis.
THE CHANGES OF PLASMA ANTIBACTERIAL PEPTIDE LL-37 IN THE BLOODSTREAM INFECTED CHILDREN
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Background and aims

To explore the changes of plasma LL-37 in the bloodstream infected children.

Methods

40 patients with bloodstream infection were included in case group. Double blood cultures from different parts were positive in these children. 40 normal children with matched age and gender were control groups.

Results

Case group can be divided into MODS group and N-MODS group according to whether the patients had multiple organ dysfunction. Critical group and non critical group were defined according to whether the severity score is above 90. The concentration of plasma LL-37 in patients with bloodstream infection was 35.37±18.23ng/ml, the concentration in control group was 23.20±9.25ng/ml (t=3.765, p<0.001). We draw ROC curve using plasma LL-37 levels and whether the child had bloodstream infection (AUC=0.711, p=0.001). The concentration of plasma LL-37 with bloodstream infections is related to the number of peripheral blood neutrophils (Pearson correlation coefficient r=0.426, p=0.006). In bloodstream infection group, the level of LL-37 was increased in 18 cases. The number of peripheral blood neutrophils in these patients was (12.92±9.05)x10⁹/L. The level of LL-37 was not increased in other 22 cases. The bloodstream infection patinents were include 22 cases with MODS and 18 patients with N-MODS. The concentration of plasma LL-37 in patients with MODS group is 28.35±15.45ng/ml, N-MODS group is 43.94±18.09ng/ml (t=2.892, p=0.007). The bloodstream infection group were divided into critical group (15 cases) and non critical group (25 cases), the concentration of plasma LL-37 in critical group was 27.25±17.09 ng/ml, non critical group was 40.23±17.45ng/ml (t=2.306, p=0.028).

Conclusions

The body’s defense function is impaired when patients with bloodstream infection had a low level of plasmion
DISTRIBUTION AND DRUG RESISTANCE OF NONFERMENTATIVE BACTERIA ISOLATED FROM PEDIATRIC INTENSIVE CARE UNIT IN SHENZHEN CHILDREN’S HOSPITA

Background and aims

To investigate the distribution and drug resistance of nonfermentative bacteria isolated from pediatric intensive care unit (PICU) in a children’s hospital, and to guide rational clinical use of antibiotic drugs.

Methods

The bacterial strains were isolated in PICU from Jan 1, 2011 to Dec 31, 2015, and identified in VITEK 2 COMPACT automatic bacteria analysis system. The results were determined by CLSI 2015 edition standard and analyzed with software WHONET 5.4.

Results

The 366 strains of nonfermentative bacteria were isolated in the specimens sent from PICU in Shenzhen Children Hospital. The top 3 bacteria were Acinetobacter baumannii (35.25%), Pseudomonas aeruginosa (33.88%) and Stenotrophomonas maltophilia (18.03%). Most of the specimens were isolated from sputum (55.64%). By statistical analysis, the results showed that the drug resistance rate of most antibiotics was low. The detection rate of Pseudomonas aeruginosa resistant to Pseudomonas aeruginosa was 8.90% and that of Acinetobacter Bauman was 8.50%.

Conclusions

For the treatment of infections caused by non fermenting bacteria, drug selection should be carried out according to the drug resistance spectrum of the bacteria in the hospital.
1 Case Report of Hereditary Ataxia Combined with EpsteinBarr Virus Infection
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Background and aims

We provide a case of Hereditary ataxia child combine with the immunodeficiency, and he had recurrent EB virus infection. We hope to further understand the disease after the case.

Methods

It was a nine-year-old boy who was admitted to hospital for nine months due to the refractory fever. After his first birthday, the child gradually appeared to walk unsteadily, then the boy gradually developed the symptoms of ataxia and conjunctiva capillary hyperplasia. Because the child got fever repeatedly, and we detected the EB virus positive, so we gave the ganciclovir intravenous drip at the initial stage. However, the therapeutic effect was not satisfactory. Then we found his significantly reduced immune IgG. Therefore, We gave combination therapy of IVIG and ganciclovir, and the fever rapidly released. But about every two months , the boy still got fever again which still caused by EB virus infection or bacterial infection together meanwhile immune IgG reduced again. Again we gave combination therapy of IVIG and ganciclovir or antibiotics, the infection was also be controlled. However, there was no good treatment for the primary disease.

Results

We combined with ganciclovir and immunoglobulins, the child had a good therapeutic effect.

Conclusions

Hereditary ataxia patients infected with epstein-barr virus always could not have good treatment effect cause of their low immune function. So anti-infection treatment combine with immunotherapy maybe more efficiency to those patients. And monitoring immune function and complementing immunoglobulin regularly are also very important.
TO STUDY THE CLINICAL, LABORATORY, AND RADIOLOGICAL CHARACTERISTICS OF PNEUMONIA DUE TO CHLAMYDIA TRACHOMATIS IN CHILDREN

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Background and aims

To study the clinical, laboratory, and radiological characteristics of pneumonia due to Chlamydia Trachomatis in children.

Methods

Between January 2016 and July 2017, children admitted to the Beijing Children’s Hospital with the diagnosis of C. Trachomatis pneumonia were retrospectively studied. Chlamydia Trachomatis infection in children with pneumonia were confirmed by positive serologic test for Chlamydia Trachomatis antibodies. Medical records, laboratory investigations, and chest radiograph findings were reviewed in all patients.

Results

A total of 19 children, 9 boys and 10 girls, with diagnosis of C. Trachomatis pneumonia were retrieved. All were under age of 3 months. Most children (18/19) were born by vaginal delivery. The onset of symptoms began from 16-42 days after birth (median 30 days). The median duration of symptoms before admission was 15 days (range, 7 to 50 days). Clinical symptoms included cough (19/19), tachypnea (4/19), crepitant rales or crackles (18/19), wheezing (5/19), and retractions (9/19). In the FBC, the median leukocytes was \(13.3 \times 10^9/L\), ranging between \(9.66 \times 10^9/L\) and \(21.8 \times 10^9/L\), lymphocytes were predominately. Peripheral eosinophilia (eosinophils >=400/mm\(^3\)) was present in 79% (15/19) children. Radiographic features showed infiltration was usually bilateral and interstitial (19/19); reticulonudular pattern (6/19) or ground glass signs (9/19) were also presented. Mixed infection with other pathogens included respiratory syncytial virus (1/19), cytomegalovirus (8/19), streptococcus pneumonia (3/19) or parainfluenza virus 3 (1/19). The median duration of hospitalization was 12 days (range, 5 to 42 days). All patients were treated with erythromycin and responded well.

Conclusions

The manifestation of C. trachomatis pneumonia is respiratory symptoms without fever. Bilateral infiltrations and diffuse interstitial reticular nodules were the most common imaging features of C. Trachomatis pneumonia.
ANALYSIS OF EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS IN THE 857 PATIENTS WITH PEDIATRIC PERTUSSIS

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Background and aims

To analyze epidemiological and clinical characteristics of pertussis in children, and to provide a scientific basis for effective prevention, control and treatment of pertussis.

Methods

A retrospective analysis was made on the clinical date of 857 pertussis patients in Xi'an Children’s Hospital between Jan 2015 and Dec 2016.

Results

The male to female ratio was 1.21:1; 21.3% came from urban areas and 78.7% from rural areas; the total cases were reported throughout the year, indicating two peak times of onset: July to September and February to April; 47.5% were younger than 5 months, including 50 with severe-type pertussis (84.7%); 55.9% were inoculate with DPT vaccine; 57.4% were exposed to their family members who coughed at that time. The median cough duration was 16 days. The main symptom was spasmodic cough (97.5%), followed by facial suffusion (94.0%), peri-oral cyanosis (35.9%), asthma (31.4%), crow-like echo (28.9%). Lukocytosis was found in 505 cases (58.9%); 702 cases (81.9%) had predominant lymphocytosis; at Week One in the treatment, no spasmodic cough was reported in 515 (60.1%) and obviously relieved in 198 (23.1%).

Conclusions

The incidence of pertussis has been increasing in Xi'an, varying depending on seasons, areas and ages. Infants less than 5 months old, with no or incomplete DTP vaccination had high susceptibility to pertussis; often had a severe clinical presentation. In many cases, those with pediatric pertussis are infected from family members; and have spasmodic cough with good prognosis, but showing no typical clinical signs.
Background and aims

Staphylococcus aureus causes a wide spectrum of life-threatening infections in children. Our aim was to describe the epidemiology and incidence of invasive S. aureus disease in children presenting to our hospital, and to compare the particular clones of S. aureus strains.

Methods

Clinical data and invasive S. aureus isolates were prospectively collected. Molecular typing was performed, followed by antibiotic resistant test.

Results

Results: Among 30 invasive S. aureus infection cases, eight (8/30) of the patients were less than 1 month old. Fourteen kinds of diseases were observed, MRSA is more likely to cause osteomyelitis than MSSA (P=0.047). The dominant two-site infections were sepsis with skin soft tissue/pneumonia/osteomyelitis. The main multi-site infection was sepsis with osteomyelitis, arthritis. Thirty-eight isolates (21/38 MSSA and 17/38 MRSA) were confirmed with invasive S. aureus infection. A total of 10 STs were included, thirteen ST 59 isolates belonged to MRSA, ST22 clone included 4 MRSA and 7 MSSA. Eight spa types were found in the S. aureus isolates, with the most frequent being t309 (12/38, 4 MRSA and 8 MSSA). Two epidemic clones were MRSA-Agr1-ST59-t437 (8/38), MSSA-Agr1-ST22-t309 (7/38). The resistance rate to clindamycin was 81.6%, MRSA was higher than MSSA (94.1% vs 66.7%, P=0.02). All isolates were susceptible to linezolid, tigecycline, fusidic acid, mupirocin and vancomycin.

Conclusions

Invasive S. aureus infection was characterized by multi-site infections in Chinese children. There was no difference in the clinical characterization between MSSA and MRSA infection. Two dominant clones were MRSA-Agr1-ST59-t437 and MSSA-Agr1-ST22-t309. All isolates were susceptible to linezolid and vancomycin.
AUTOSOMAL RECESSIVE HYPER-IGE SYNDROME IN TWO BROTHERS OF A CHINESE FAMILY: A NOVEL DOCK8 MUTATION IDENTIFICATION AND LITERATURE REVIEW

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Background and aims

Autosomal recessive hyper-IgE syndromes (AR-HIES) cause by DOCK8 dysfunction is also called DOCK8 immunodeficiency syndrome (DIDS). It’s mainly characterized by elevated serum IgE level and eosinophilia, refractory cutaneous viral infections, recurrent sinopulmonary infections, severe atopic dermatitis, food and environmental allergies, and malignant tumors in the late childhood or adulthood. We diagnosed a family with two brothers both suffered from autosomal recessive hyper-IgE syndrome. We intend to explore the genetic and immunologic defects of the patients, to improve our understanding of the disease.

Methods

DOCK8 gene was analyzed by targeted deep sequencing and Sanger sequencing, the large deletions were identified by quantitative real-time PCR. The frequency of lymphocytes subsets of was determined using flow cytometry.

Results

We found a heterozygous lost at c. 646-647 of DOCK8 coding region of the patients and their father, also a large heterozygous deletion spanning exons 1–48 of the DOCK8 and exon1 of the downstream gene KANK in the patients and their mother. The percentage of CD3+CD4+ T cells, CD3+CD8+CD27+CD45RA+ ( naïve T cell), Treg(CD4+CD127-CD25+FOXP3+) and CD19+CD27-IgD+( naïve) were lower compared to their parents and healthy control.

Conclusions

We identified a novel mutation of DOCK8 gene that lead to autosomal recessive hyper-IgE syndrome.
THE CLINICAL AND ETIOLOGICAL CHARACTERISTICS OF SECONDARY NOSOCOMIAL BACTERIAL INFECTIONS ASSOCIATED WITH INFECTIOUS MONONUCLEOSIS DISEASES IN CHILDREN

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Background and aims

In the clinical process, we found that infectious mononucleosis (IM) children were prone to hospital bacterial infection. So, we aimed to investigate the clinical manifestations and pathogenic characteristics of nosocomial bacterial infection in IM.

Methods

A retrospective analysis were performed for IM children from January to December 2015 in West China Second University Hospital. And according to whether there was the course of secondary bacterial infection, the patients were divided into the secondary infection group and the non-infection group. The clinical manifestations and pathogenic bacteria were analyzed.

Results

216 children with IM enrolled, 177 (81.9%) were the non-infection group, and 39 (18.1%) were the secondary infection group. The difference was statistically significant in age (p=0.02). The rate of nosocomial bacterial infection was significantly higher (t=5.738, p<0.01). The pathogenic bacteria were mainly gram-negative bacteria. Variant lymphocytes increased in 212 cases (98.1%), which was not related to nosocomial bacterial infection (χ²=1.289, p=0.525). C reactive protein (CRP) of the secondary infection group was (10.2 + 9.7) mg/L, which were no difference between the 2 groups (χ²=0.599, p=0.741). CD3+ lymphocytes (t=4.724, p<0.01) and CD8+ lymphocytes (t=5.738, p<0.01) increased significantly, the proportion of CD4+ lymphocytes decreased significantly (t=2.685, p=0.013).

Conclusions

The IM children are susceptible to nosocomial bacterial infection, which is more obvious in school-age. Lower respiratory tract infections are the most common, and pathogenic bacteria may be caused by the dissemination of colonization bacteria of pharyngeal tonsils. The CRP and variant lymphocytes on admission could not be used as the marker for predicting nosocomial bacterial infection in IM.
ANALYSIS ON SURVEILLANCE OF MYCOPLASMA PNEUMONIAE INFECTION IN CHILDREN
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Background and aims

Mycoplasma pneumoniae (M. pneumoniae) is an important pathogen causing respiratory tract infection in adults and children.

Methods

(1) Study population: patients seeing fever clinic for on-site investigation of M. pneumoniae respiratory tract infections.

(2) The clinical data of the subjects were obtained by questionnaire, medical history collection, physical examination and assistant examination.

(3) Pharyngeal swab acquisition and DNA detection

(4) Culture and isolation of M. pneumoniae strains

(5) Drug resistance analysis and mutation detection of M. pneumoniae strains: isolated strains were detected and analyzed for macrolide-resistance, and the mutation points were confirmed.

(6) Molecular typing of M. pneumoniae strains: all isolates were detected by MLVA molecular genotyping and P1 gene typing.

Results

A total of 1025 patients were enrolled. Among them, 163 were M. pneumoniae-DNA positive, with the positive rate 15.09%. M. pneumoniae carrying time varied by different parts of M. pneumoniae infection: pneumonia was the longest, bronchitis the second, and URI the shortest. A total of 94 M. pneumoniae strains were isolated from M. pneumoniae-DNA positive patients, with the isolation rate 57.7%. MLVA typing distinguished the strains into 8 types. Except 2 strains, all the other 92 strains (97.9%) were macrolide-resistant strains.

Conclusions

M. pneumoniae infection tended to occur in children over the age of 5 years, summer and autumn were epidemic seasons, and pneumonia was the most common form of M. pneumoniae infection. Age, severity of disease and multiple siblings were risk factors of M. pneumoniae infection. Macrolide-resistant strains were popular at present.
CLINICAL ANALYSIS OF FIVE CASES OF MYCOPLASMA PNEUMONIAE PNEUMONIA WITH FEVER SPONTANEOUS REMISSION IN CHILDREN
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Background and aims

Mycoplasma pneumoniae (MP) is a common cause of community-acquired pneumonia in elderly children. Although Mycoplasma pneumoniae pneumonia (MPP) is usually a benign, self-limited disease, some cases can develop into refractory or severe, even life threatening disease. The aim is to investigate the clinical phenotype of MPP in children.

Methods

The clinical data of 5 cases of MPP with fever spontaneous remission who had been in our hospital from December 2013 to August 2016 were retrospectively analyzed.

Results

1. All the 5 cases presented fever and cough as the predominant symptoms. The fever presented as middle to high degree and got completely remission spontaneously with the febrile time for 6 to 9 days; 1 case presented dyspnea; 1 case presented pleuritis. 2. The chest radiograph showed segmental or lobar pneumonia in 3 cases and lobular pneumonia in another 2 cases. 3. There was no elevation of the peripheral white blood cell count or procalcitonin whether the cases were in the febrile period or not. 3 cases presented elevated C-reactive protein in the febrile period and returned to the normal range with the fever remission. 4. There was no improvement of pulmonary symptoms or sighs at the same time with the fever remission.

Conclusions

MPP can present fever spontaneous remission in children, however the improvement of pulmonary symptoms and sighs are not simultaneous with the fever remission. MPP with fever spontaneous remission exhibit common features in clinical manifestations and chest radiography compared with the MPP which we have known.
Background and aims

The relative prevalence and impact of coinfection in children with human rhinoviruses (HRV) infections remains uncertain. The aim of this study was to analyze the epidemiology, clinical features and outcomes of lower respiratory tract infections (LRTIs) caused by HRV mono-infection compared to coinfection among hospitalized children.

Methods

Aged one month to 14 years children with episodes of LRTIs and detectable entero/rhinoviruses RNA in nasopharyngeal aspirates between January 2014 and December 2014 were investigated.

Results

Altogether 295 of the 992 nasopharyngeal aspirates (29.7%) were positive for entero/rhinoviruses. Co-pathogens were detected in 197 children, 158 (53.6%) episodes considered coinfection were analysed. The viruses most frequently codetected with entero/rhinoviruses was RSV (34, 13.3%), followed by parainfluenza and adenovirus. *Mycoplasma pneumoniae* and *S. pneumoniae* were the most commonly detected atypical respiratory pathogens and bacterial, respectively. The median age of children with entero/rhinoviruses mono-infection was significantly lower than those coinfected with atypical pathogens (10.0 vs. 22.0 (month), P<0.05). Children with entero/rhinoviruses mono-infection presented with significantly lower rate of moist rale (36.7% vs. 53.3%, P<0.05) and oxygen uptake (11.2% vs. 28.0%, P<0.01) than those coinfected with other respiratory virus. Laboratory examinations, chest radiographic abnormalities, and duration of hospitalization were no significant difference between entero/rhinoviruses mono-infection and coinfections.

Conclusions

Coinfection is common in LRTIs among children with entero/rhinoviruses detection. Age, moist rale and oxygen uptake are different clinical features between entero/rhinoviruses mono-infection and coinfections. The outcomes was no significant difference between entero/rhinoviruses mono-infection and coinfections.
PERTUSSIS – AN UNDERAPPRECIATED CAUSE OF CHRONIC COUGH IN CHILDREN

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Chronic cough is one of the most common problems referred to pediatricians and respiratory physicians. Pediatric chronic cough is defined as any cough lasting more than 4 weeks. Pertussis, or whooping cough, is an highly contagious bacterial disease of respiratory tract. However, in countries with routine vaccination against pertussis with high coverage, pertussis is always overlooked and underappreciated, and not usually taken into consideration for the etiology of chronic cough in children. We conducted a prospective study to determine the prevalence of pertussis in children with chronic cough.
COMPARISON STUDY OF METHICILLIN-RESISTANT AND METHICILLIN-SUSCEPTIBLE STAPHYLOCOCCUS AUREUS BLOODSTREAM INFECTION IN CHILDREN
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Background and aims
Staphylococcus aureus (SA) is an important pathogen of bloodstream infection (BSI) in pediatric patients. We aimed to compare the epidemiologic characteristics and the antimicrobial sensitivity of BSI caused by methicillin resistant S. aureus (MRSA) and methicillin sensitive S. aureus (MSSA), and to explore the risk factor of MRSA-BSI and its effect on clinical outcomes.

Methods
Cases with confirmed SA-BSI from January 2004 to December 2016 were studied. BSI which developed >48h after admission was defined as hospital-acquired (HA). While these developed within 48h was community-acquired (CA).

Results
161 SA-BSIs (MRSA-BSI 63 and MSSA-BSI 98) were identified. The age ranged from 1h to 16y (median age 26d). 103 cases were CA-BSIs and 58 cases were HA-BSIs. MRSA was responsible for 60.3% of HA-BSI. The common concomitant diseases were skin or soft tissue infection (n=53), followed by pneumonia (n=52) and purulent osteoarthritis (n=16). Patients with MRSA-BSI were more likely to use antibiotics in the past one month (42.9% vs. 21.4%) and previous antibiotics therapy (OR=2.274, P<0.05) was an independent risk factor. The resistant rates of MRSA to cefazolin,ceftriaxone,erythromycin,clindamycin,gentamycin,trimethoprim and sulphamethoxazole,chloramphenicol,ciprofloxacin were were significantly higher than MSSA. 18 patients were died including 7 cases of MRSA-BSI and 11 MSSA-BSI. the fatality rates were 11.1% and 11.2%, respectively. The length of hospital stay in patients with MRSA-BSI was significant longer than those with MSSA-BSI (27.3 d vs. 19.2 d).

Conclusions
Previous antibiotic therapy is an independent risk factor for MRSA-BSI. MRSA is a predominant hospital-acquired pathogen in children with BSI. Although MRSA-BSI prolonged the hospital stay, the fatality rate is similar to MSSA-BSI.
CLINICAL FEATURES OF 413 CASES OF TINEA FACIEI IN CHILDREN DURING TEN YEARS IN BEIJING

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Background and aims

To analyze the age distribution, the mycology and clinical presentation of tinea faciei in children.

Methods

From Jan 2006 through Jan 2016, 413 patients were diagnosed with tinea faciei from Beijing Children’s Hospital.

Results

Four hundred and thirteen patients aged 19 days to 15 years (187 men and 226 women) with a mean age of 5 years. Four hundred dermatophytes were isolated from those patients. The pathogen responsible for tinea faciei was Microsporum canis in 155 patients (38.8%), Trichophyton mentagrophytes in 110 (27.5%), M. gypseum in 95 (23.8%), T. rubrum in 31 (7.7%), T. violaceum in 8 (2.0%), and T. verrucosum in 1 (0.2%). Contacting with infected pets was the significant risk factors of tinea faciei in children. A trend for an increase in M. gypseum and T. rubrum-positive tinea faciei has been observed. The application of topical steroids may modified the manifestations of tinea faciei.

Conclusions

The dermatophytes most frequently isolated were Microsporum canis, Trichophyton mentagrophytes and M. gypseum. Contacting with infected pets was closely related to the pathogenesis of tinea faciei in children. The infection route of tinea faciei began to change. The use of corticosteroids could lead to atypical facial ringworm caused by misdiagnosis.
Background and aims

By comparing the use of antibiotics in hospitalized children before and after antibiotic special rectification activities (the end of 2015 year), evaluate the rationality of antibiotics, to provide a reference for the rational use of antibiotics.

Methods

Survey 2000 medical records have been filed in 2015 year and 2016 year according to the principle of rational use of antibiotics.

Results

The antibiotic use rates were 82.5% and 41.38% in 2015 and 2016 respectively, single medication is 64% and 73.7%, drug combination is 34.5% and 24.82%. The proportion of using antibiotics in community-acquired pneumonia children is 82% and 42.12%. The use of antibiotics is mainly macrolides, cephalosporins and penicillins, accounting for 52.17%, 30.43% and 17.39%. The positive rate of respiratory tract sputum specimens is 44.20% and 35.20%. 2015 year lower respiratory tract detection of bacteria is Streptococcus pneumoniae 46%, Haemophilus influenzae 27%, Moraxella catarrhalis 15%, Staphylococcus aureus 7%. 2016 year lower respiratory tract detection of bacteria is Haemophilus influenzae 41%, Streptococcus pneumoniae 39%, Moraxella catarrhalis 17%, Staphylococcus aureus 1.3%. The positive rate of alveolar lavages is 7.5% and 27.7%. The bacterial rankings in alveolar lavage fluid are haemophilus influenzae 42%, Streptococcus pneumoniae 31%, Pseudomonas aeruginosa 7%, Escherichia coli and Staphylococcus aureus were 4%.

Conclusions

After the antibiotics special rectification activities, the use of antibiotics is more rational. Antibiotic selection is based on possible pathogens, severity, duration, age, previous antibiotic use, epidemiological data of local bacterial resistance, and liver and kidney function etc. Choose the most suitable antibiotics.
Clinical Characteristics of Pertussis Encephalopathy in 8 Infants

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Objective To investigate the clinical characteristics, diagnosis, treatment and prognosis of Pertussis encephalopathy.

Methods Clinical data of 8 infants with Bordetella pertussis infection, confirmed by culture or real-time polymerase chain reaction (PCR) of nasopharyngeal secretion, in the course of the disease, and with toxic encephalopathy, diagnosed with Pertussis encephalopathy, were retrospectively analyzed.

Results From October 2013 to December 2015, 868 cases were diagnosed with pertussis in Shenzhen children's hospital, 352 were infants less than 3 months of age. 8 cases were involved in the study. 7 cases were male and 1 case was female, age ranged 20~78 days, the mean age was (45.5±23.23) days. Pertussis encephalopathy occurred in 0.92% of all pertussis cases, occurring in 2.27% of those the same age. Time elapsed between onset of first symptoms and hospital admission was 7~22 days, mean (11.5±6.35) days. 8 cases with no symptoms such as rhinobyon and rhinorrhea, had paroxysmal cough; 7 cases displayed cyanosis; 2 cases showed frequent apnea. Encephalopathy occurred at 6~29 days from the onset of the cough, mean (16.63±9.02) days. All cases presented with seizures. Encephalopathy was associated with fever in 5 cases, the highest temperature was 38.9 ℃. Lumbar puncture was performed in 6 cases. Cerebrospinal fluid (CSF) showed elevated pressure in 3 cases with mildly elevated protein in 4 cases. Brain CT examination was performed in 6 cases, cerebral edema was seen in 2 cases. Brain magnetic resonance imaging (MRI) was normal in 3 cases. 8 cases were treated with erythromycin or azithromycin for 6~14 days, mean (9.88±2.7) days. All cases showed significant improvement.

Conclusions Pertussis encephalopathy is an uncommon complication of pertussis, but is still observed clinically. It should be considered in patients not vaccinated with DTP, especially the course of 2~4 weeks.
RELATIVE FACTORS ANALYSIS OF PEDIATRIC DIABETIC KETOACIDOSIS: INFECTION IS STILL AN IMPORTANT ONE

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Background and aims

The main objective of this research was to investigate the risk factors of Diabetic ketoacidosis (DKA), so as to minimize the incidence of DKA and reduce the severity to the maximum extent.

Methods

Analysis was conducted on the inpatient medical records of the 185 cases of type 1 diabetes patients hospitalized during 2003-2012. The contents of record included sex, age, admission date, birth date, duration of symptoms, and whether infection was accompanied. The detail about the living environment of the patients when the disease occurred was conducted by means of telephone interview. The patients were divided into the DKA group and the non DKA group for comparative analysis.

Results

The DKA group included 84 patients, the non-DKA group, 101 patients. There were 53 patients having been ill for less than 2 weeks before the hospitalization, 46 patients, less than 8 weeks, and 86 patients, more than 8 weeks (46.5%). There were 101 patients accompanied by infections, and 84 patients were without infections. The multivariate logistic regression was conducted on the correlation factors. The results indicated that the duration of illness and the infection status were the important influential factors for DKA.

Conclusions

The ratio of patients sick for more than 8 weeks before the hospitalization was the highest. The ratio of infections for patients with DKA was higher. The duration of symptoms and infections were the important risky factors for DKA.

Control of the infections can help to reduce the incidence and severity of DKA.
SAFETY OF RECOMBINANT HUMAN INTERFERON A1B INJECTION INHALING AS THERAPY FOR VIRAL DISEASES IN CHILDREN: A SYSTEMATIC REVIEW AND META-ANALYSIS
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Background and aims
To systematically assess the safety of recombinant human interferon α1b (rhIFNα1b) injection inhaling as therapy for viral diseases in children, so as to provide reference of evidence-based medicine for the clinical treatment

Methods
Randomized controlled trials (RCTS) of rhIFNα1b injection inhaling for viral diseases in children were searched through PubMed, SCI, CNKI, WanFang Database; RCTs were selected according to the inclusion and exclusion criteria. Related data were extracted and the meta-analysis was performed.

Results
Eight RCTs were involved, including 1446 patients. The Meta-analysis revealed that, in the overall, 24 cases out of 780 cases in rhIFNα1b injection inhaling treatment group and 41 cases out of 666 cases in control group had adverse reactions. The incidence of adverse reactions was lower in rhIFN α1b injection inhaling treatment group than that in control group: [Z=2.65 (P=0.008), RR=0.52 (95%CI: 0.33-0.85)]. But, there was no statistically significant difference of incidence of adverse reactions between rhIFN α1b injection inhaling treatment group and control group in gastrointestinal adverse reaction subgroup and the test for overall effect was Z=1.56 (P=0.12), RR=0.65 (95%CI: 0.38-1.12)

Conclusions
Compared with other antiviral drugs, the treatment of pediatric common viral diseases with rhIFNα1b injection inhaling has good safety, low incidence of adverse reactions.
PREDICTING VALUE OF THROMBOSPONDIN-2 FOR CORONARY ARTERY DILATATION IN PATIENTS WITH KAWASAKI DISEASE

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Background and aims

To investigate the predictive value of thrombospondin-2 (TSP-2) in children with coronary artery dilatation (CAD) secondary to Kawasaki disease (KD).

Methods

This study was a retrospective controlled study, the patients were divided into KD group (33 cases with CAD, 31 cases without CAD) and control group (32 cases in fever group, 32 cases in healthy group). The levels of TSP was measured by Enzyme linked immunosorbent assay (ELISA) method and the related clinical information was analyzed. Normal distribution of data were compared by analysis of covariance or two independent samples t-test. Analysis of covariance was used to remove the effect of age. The chi-square test was used to analyze categorical data and receiver operating characteristic (ROC) curve for evaluating the predictive value of TSP-2.

Results

Compared with the febrile group and healthy group, plasma TSP-2 and TSP-1 of KD group was significantly elevated. The TSP-2 concentration in the group with CAD was significantly higher than the group without it. Regarding the predictive effect of TSP-2 for CAD, sensitivity was 54.5%, specificity was 80.6%, and the cut-off point was 33.9 mg/L. When TSP-2 was combined with albumin<35 g/L to predict CAD, the area under the ROC curve was 0.701, sensitivity was 60.0%, specificity was 82.4%, and the cut-off point was 33.8 mg/L.

Conclusions

During the acute phase of KD, TSP-2 levels were significantly elevated. It could be used to predict the occurrence of CAD. The predictive value of TSP-2 was significantly improved when combined with albumin.
ST59-SCCmec IV-t437 clone with strong biofilm-forming capacity was identified predominantly in MRSA isolated from Chinese children

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Background and aims

Biofilm can protect Staphylococcus aureus from the damage of antibiotics and host immune system. This study aimed to investigate the biofilm formation of clinical Staphylococcus aureus isolated from Chinese children, and the relationship between biofilm formation and various genetic characteristics.

Methods

Staphylococcus aureus strains were isolated from children in Beijing, China, from February 2016 to January 2017. All strains were typed by MLST and spa typing. MRSA strains were also typed by SCCmec typing. Biofilm formation and biofilm associated genes were analyzed.

Results

A total of 209 isolates were collected, and 47.8% (100/209) were identified as MRSA. ST59-SCCmec IV-t437 (62%) was the most prevalent genotype of MRSA, and ST22-t309 (13.8%), ST398-t571 (11.0%), ST5-t002 (8.3%), ST25-t078 (6.4%), ST188-t189 (5.5%) were the top five genotypes of MSSA. 85% of MRSA and 53.2% of MSSA showed strong biofilm formation. 88.7% of the predominant ST59-SCCmec IV-t437 clone of MRSA were strong biofilm former, and this predominant clone could produce significantly higher biofilm than other MRSA isolates (P=0.0041). The biofilm formation of MSSA ST188-t189 clone was much higher than ST22-t309, ST398-t571 clones (P=0.0070, and P=0.0114, respectively). The prevalence of the biofilm associated genes among ST59-SCCmec IV-t437 clone was: icaA (100%), icaD (98.4%), fnbpA (100%), fnbpB (0), clfA (100%), clfB (100%), cna (1.6%), bbp (0), ebpS (82.3%), sdrC (79.0%), sdrD (4.8%), and sdrE (96.8%).

Conclusions

These results indicated strong homology of the MRSA isolated from Chinese children, in which ST59-SCCmec IV-t437 clone with strong biofilm formation was determined predominantly. The MSSA, in contrast, were very heterogeneity.
DETECTION OF CIRCULATING HISTONE H4 IN CHILDREN WITH SEPSIS

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OBJECTIVITIES:
To identify the differences of circulating histone H4 levels in different phrase of children with sepsis, investigating its possible role in the process of the disease.

METHODS: 22 Children with sepsis who were admitted to the Pediatric Intensive Care Unit (PICU) of Shen-Zhen Maternity and Children Healthcare Hospital between November 1st, 2016 and May 30th, 2017 were test group. The diagnosis followed Consensus on Diagnosis and Treatment of Pediatric Septic Shock 2015. 20 healthy children were the control group. Plasma of the two groups children were gathered, including the samples on the 1st and the 3rd day after admission. Histone H4 levels of all children were detected by enzyme-linked immunosorbent assay (ELIZA). All data were reconfigured and analyzed by SPSS 23.0. Employing ONE-WAY ANOVA for comparison among groups and Pair-samples T Test for comparison within the group.

RESULTS: 1. Difference of histone H4 levels between the two groups is not statistically significant (F=0.732, P=0.397). 2. Difference of histone H4 levels between samples collected on the 3rd day after sepsis and those of control group is statistically significant (F=5.028, P=0.030). 3. The levels of H4 histone in samples collected on the 3rd day after sepsis increased significantly comparing to those of the 1st day (Δ=30.2±66.0umol/L, t=2.14, p=0.044).

CONCLUSION: The levels of circulating histone H4 in sepsis children increase significantly as the disease develops, suggesting that it might affects the process of the sepsis in certain ways.

Keywords: Sepsis; Histone H4; Children
ANALYSIS ON THE CLINICAL FEATURES AND ETIOLOGY OF THE HFMD (HAND-FOOT-AND-MOUTH DISEASE) PATIENTS CHARACTERIZED WITH BULLAE IN TAIYUAN

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Background and aims

To analyze the clinical features and the etiology of HFMD patients with Bullae in Taiyuan from January to July, 2017.

Methods

The clinical data of 10 cases of HFMD patients characterized with bullae diagnosed in Shanxi Children’s Hospital from January to July, 2017 were collected and all the patients were followed up. The Fluid in skin bullae were determined by RTFQ PCR (real-time fluorescence quantitative PCR). The serum antibodies were determined in the laboratory in Shanxi Children’s hospital.

Results

In the 10 cases, 7 cases of antibodies against enterovirus were positive, 8 cases of CA6 (Coxsackievirus 6) were positive, 1 case of EV71 was positive, 1 case of CA16 (Coxsackievirus 16) was positive.

Conclusions

HFMD with bullae should be clinically paid more attention to because of the easy misdiagnosis as erythema polymorphe, chickenpox, herpes zoster.
Background and aims

To investigate clinical features, treatment and prognostic factors of infection-associated hemophagocytic lymphohistiocytosis (IAHLH) in children.

Methods

A retrospective study was performed to analyze the clinical features, laboratory assessment, treatment and clinical outcomes of 145 childhood IAHLH from January 1st 2010 to June 30th 2017.

Results

IAHLH accounts for 81% (145/180) in all HLH patients at the same period. Of the 145 cases, 50 were infected with Epstein-Barr virus (34%), 4 with typhia, 2 with tsutsugamushi disease, 1 with tuberculosis. 80 were with other infection and 8 with unknown causes. All patients had fever. Complete blood count indicated two cell lines decreased or pancytopenia. Other laboratory findings included hypertriglyceridemia and/or hypofibrinogen, elevation of ferritin. Bone marrow examination found hemophagocytes. Other clinical manifestations included polyserositis, liver function damage, jaundice, respiratory system and central nerve system involvement. Treatment for IAHLH involved treating the underlying medical condition and taking consideration the circumstances to follow HLH 2004 protocol. The course of the treatment depended on the assessment of the disease. Of the 145 patients studied, 122 achieved remission (84%), 1 recurrence (0.6%), 22 deaths (15%). Of the 22 dead cases, 11 were EBV associated, 11 were caused by sepsis.

Conclusions

Our single center experience indicates that IAHLH is induced by varies causes. EBV associated HLH is the most prominent causes of AIHLH. Enhance our understanding of IAHLH, early diagnosis and intensive treatment can improve the prognosis. HLH 2004 protocol can help to improve the survival.
Streptococcal toxic shock syndrome (STSS) is rare and severe manifestation of Streptococcus pyogenes infection. Recently, Streptococcal toxic shock-like syndrome (STSLs) has also been described in relation to other streptococcal infections, including Streptococcus agalactiae, but much less common than S. pyogenes. There were 22 reported cases of S. agalactiae STSLs but all happened in adult. We perform a brief review of the 22 cases. Until recently, STSLs was considered very uncommon in children. STSS of S. pyogenes has been attributed to the presence of superantigens, while the pathogenesis of the ‘toxic shock’ in S. agalactiae infection is less clear.

**Methods**

We discuss the possible role of toxins in a reported case of a 6 month-old infant with S. agalactiae STSLSA.

**Results**

This child tragically died from Group B STSLs, which does not exclude due to hemolysin and other toxins. Further clarification of the role of toxins in S. agalactiae infection should be consideration. STSLs is common in elderly and have underlying chronic disease in adult patients, but our case was a previously healthy children, this point may a features of STSLs differ between kids and adults.

**Conclusions**

The child case of Group B STSLs belongs late, late-onset GBS infection, but presented with rapidly progressive deterioration of clinical condition. In the current “one child policy” China special status, the STSLs cases had special warning value for the importance of early correct diagnosis and treatment for future relevant cases.
ACUTE SUPPURATIVE THYROIDITIS SECONDARY TO CONGENITAL PYRIFORM SINUS FISTULA: A CASE REPORT AND CLINICAL REVIEW
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Background and aims

Acute suppurative thyroiditis (AST) is a rare disease. Most cases have been reported caused by aerobic bacteria. However, those caused by anaerobic bacteria, mycobacteria, fungi, or other nonbacterial pathogens are rarely reported. Here, we report a case of AST in children caused by more than two kinds of bacteria. Besides we provide a review of the literature and an approach to early diagnosis, prompt management and prognosis estimate based on multidisciplinary experts opinions through this case.

Methods

We reported a 14-year-old teenager who presented with thyroid abscess. The whole diagnosis and treatment process for this case was reviewed, and a retrospective review related to AST in children was performed utilizing PubMed.

Results

This case is caused mainly by Streptococcus gordonii and Prevotella disiens. The patient suffered a congenital pyriform sinus associated with a third branchial arch anomaly, and through this abnormal route bacteria infected the thyroid gland. Fine-needle aspiration (FNA) for bacterial culture and imaging tests were used to help diagnosis. Meropenem, Vancomycin and Metronidazole were used for antimicrobial therapy. The operation was performed for treating congenital pyriform sinus.

Conclusions

Recognition of the clinical features of AST is essential for prompt management. US-FNA for bacterial culture and recognition of the clinical and bacteriological features are essential for verifying diagnosis. The primary treatment for AST is antimicrobial therapy, directed against the likely bacterial pathogens. Operation is necessary to treat the pyriform sinus. There are multiple surgical treatment options and endoscopic treatment is a better choice.
CHEST RADIOGRAPHIC AND CT FINDINGS IN CHILDREN WITH NOVEL SWINE-ORIGIN INFLUENZA A (H1N1) VIRUS (S-OIV) INFECTION

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Background and aims

This article evaluates the chest radiographic and CT findings in children with laboratory-confirmed novel swine-origin influenza A (H1N1) virus (S-OIV) infection. Focused on the imaging characteristics of mild and severe.

Methods

42 children with novel S-OIV (H1N1) infection who underwent chest radiographs and CT scan formed the study population. Group 1 patients (n = 9) were coma, whereas required ICU admission and advanced mechanical ventilation, and group 2 (n = 33) did not. 42 cases of the children underwent chest X-ray examination, 23 cases of children (all children with the first group and second group of 14 cases of children) line of CT examination. The chest radiographs and CT scans were evaluated for the pattern (consolidation, ground-glass, nodules, interstitial lesion, and reticulation), distribution, and extent of abnormality. Two groups were compared using χ² test cases of lung between the different imaging.

Results

All group 1 patients were abnormal; extensive disease involving bilateral lung 100%(9/9), and ≥ 3 lung zones was seen in 100% (9/9) versus (7/33, 21.2%), and 9.0% (3/33) in group 2 (p < 0.05, p < 0.001, chi-square test). Pleural effusion (n=2), mediastinal emphysema (n=2) were observed in group 1. 11 patients were normal in group 2. Performance anomalies in 22 cases, 7 cases of lesions involving bilateral lung, 3 cases of lesions in three or more lobes. The two groups statistically significant differences. morphology and distribution of lesions were no significant differences.

Conclusions

In this study, Imaging of the chest may reflect the disease severity of complications and disease, and clinical manifestations of good consistency.
Background and aims

To conclude medication therapeutic regimen of urinary tract infection in Nephropathy Department, in order to provide related information to guide pharmacist further clinical works.

Methods

The clinical data of mid-stream urine culture, drug sensitive test, and urinary tract malformations in urinary tract infected children were collected from Jan. to Dec. 2016. Therapeutical and discharged medication result were analyzed.

Results

Totally 119 children were included in our study. Infants and male were in the majority. Urinary tract malformation in 44 children. The first three bacteria in mid-stream urine culture were Enterococcus faecium, colon bacillus, Klebsiella pneumo, pseudomonas aeruginosa inpatient. The most commonly used antibiotics were atamoxef, ceftriaxone, cefoperazone/sulbactam, meropenem during patients hospitalization. The third generation cephalosporin were the most used discharged medication.

Conclusions

The use of medications should be based on specific bacteria flora in children of urinary tract infection complicated with urinary tract malformation. The third generation cephalosporin for discharged patients are not recommended.
STUDY ON THE RELATIONSHIP BETWEEN INFECTION AND CLIMATIC FACTORS IN PEDIATRIC ICU PATIENTS IN A HOSPITAL IN XINJIANG

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Background and aims

To understand the relevance of the regional climate change in pediatric ICU patients and to provide reference for the prevention and control of the disease.

Methods

Collect all patient data of pediatric ICU in a hospital in Xinjiang from January 2011 to December 2016, then calculate the monthly infection rate, find the average temperature and mean temperature of Urumqi. Analyze the relationship between hospital infection and climate.

Results

(1) The increase in average temperature increases the chances of infection in the hospital ,correlation is positively correlated \( r=0.926, P=0.000 \); It is negatively correlated with average humidity \( r=-0.878, p=0.000 \); (2) The infection of the pediatric ICU Staphylococcus aureus, klebsiella pneumoniae and the enterobacter of the gutter in a hospital in Urumqi was positively correlated with the mean temperature, it is negatively correlated with moisture \( P<0.05 \); (3) The respiratory tract infection was positively correlated with average temperature, and the air humidity was negatively correlated \( P<0.05 \).

Conclusions

The ambient temperature and air humidity were significantly correlated with the infection in the pediatric ICU in Xinjiang, special attention should be paid to the prevention measures of respiratory tract infection and key bacteria during the high temperature and humidity in spring and summer.
ASSOCIATION OF ORMDL3 AND HLA-DQ SINGLE NUCLEOTIDE POLYMORPHISMS IN CHILDREN WITH MYCOPLASMA PNEUMONIAE INFECTION RELATED ASTHMA
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Background and aims

To investigate the distribution of single nucleotide polymorphisms (SNPs) and the gene-gene interactions between ORMDL3 and HLA-DQ in children with Mycoplasma pneumoniae (MP) infection related asthma.

Methods

200 children with MP infection were enrolled and divided into MP-asthma group and MP-non-asthma group. DNA was extracted by Fluidigm Juno 96.96 Genotyping integrated fluid pathway system Genotyping. SPSS19.0 software was used for statistical analysis. Gene-gene interactions were analyzed by generalized multifactor dimensionality reduction (GMDR).

Results

194 of the 200 cases with MP infection were included (6 lost cases). MP-asthma group (63 cases) accounted for 32.5% (63/194) and MP-non asthma group (131 cases) accounted for 67.5% (131/194). There are three genotypes of ORMDL3 gene rs4794820: AG, GG, AA. The frequency of GG genotype and G allele in MP-asthma group was higher than that in MP-non-asthma group (P<0.05). The percentage of AA genotype was the lowest among the two groups, but it was higher in the MP-non-asthma group than MP-asthma group (P<0.05). The rs7216389 had three genotypes including TT, TC and CC. The frequency of TT genotype and T allele in MP-asthma group was significantly higher than that in MP-non-asthma group (P<0.05).

Conclusions

1. MP infection reduced asthma accounted for 32.5% (63 cases) in total which indicates that MP infection is an important external cause of asthma in children. 2. The genotype of rs7794820 GG and rs7216389 TT are an important internal trigger for asthma after childhood MP infection. 3. There is no significant difference in single nucleotide polymorphisms of HLA-DQA1 rs9272346 and HLA-DQA2 rs7773955 between MP-asthma versus MP-non-asthma group.
Background and aims

*Mycoplasma pneumoniae* (MP) is a common and significant pathogen in aseptic encephalitis. Mycoplasma pneumoniae-associated encephalitis (MPIE) is one of the most severe extrapulmonary complications in relation to MP infection. The aim of this study was to assess the prevalence of MP infection in children with aseptic encephalitis and find clinical, radiological and laboratory features helpful to diagnosis and prognosis of MPIE.

Methods

Blood and cerebrospinal fluid (CSF) samples were obtained from all patients with informed consent. Meanwhile, CSF was cultured and assessed by real-time PCR for the presence of MP, and MP-specific IgM in serum was determined by a semi-quantitative agglutination assay. The outcome of these patients was also evaluated by the Glasgow Outcome Scale (GOS) to investigate the prognostic factors associated with MPIE.

Results

A total of 133 aseptic encephalitis children were confirmed in our study. Among them, 23 cases (17.3%) were identified as MPIE, 13 (56.5%) by the serology specific MP-IgM test, 8 (34.8%) by the CSF real-time PCR test, and 2 (8.7%) by both. Onset age older than 5 years \( (P=0.014) \), respiratory symptoms \( (P=0.019) \), consciousness disorders \( (P=0.036) \), serum CRP elevation \( (P=0.048) \), pleocytosis \( (P=0.015) \), chest imaging changes \( (P=0.026) \).

Conclusions

There are no very typical characteristics to distinguish MPIE from those non-MP-associated aseptic encephalitis cases. Combination with respiratory symptoms, consciousness disorders and chest imaging changes may be indicative for MPIE. For timely specific treatment, acute diagnosis by both serology and CSF PCR test, and even MP culture in some cases were needed.
A CASE OF SUSPECTED CVID FROM CHINA

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Background and aims

Common variable immunodeficiency is a primary immunodeficiency characterized by hypogammaglobulinemia and recurrent bacterial infections.

Methods

We report a case of a ten-year-old boy with the left axillary lump, right eyelid nodules, abnormal liver function and repeated fever in the past two years.

Results

Effective anti-infection treatment and immunoglobulin replacement therapy Physical examination, Multiple enlarged, non-tender lymph nodes in the submandibular, axillary and groin region. Hepatomegaly 4cm below costal margin, no splenomegaly Pathology of the left armpit nodes revealed atypical lymphoid hyperplasia is given priority to T cells. Contrast CT suggested multiple granulomatous lesions in the liver and spleen, differential diagnoses included fungal infections. Fungal G test was positive. GM test was negative. The immune globulin showed IgM 0.35g/L, IgG 2.35g/L.

Conclusions

Genetic analysis: It has two heterozygous mutations in LRBA coding region, c.6785T > G and c.52G > A.
CLINICAL FEATURES OF CHILDREN WITH INFECTIOUS MONONUCLEOSIS AND ANALYSIS OF RELATED FACTORS OF LIVER INJURY

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Background and aims

in order to find and intervene IM with liver function damage, analyze the clinical characteristics of children with infectious mononucleosis (infectious mononucleosis, IM) and the related factors of liver function damage.

Methods

the clinical data of 102 hospitalized children with IM were retrospectively analyzed, including the demographic characteristics, clinical manifestations, laboratory tests and complications of IM patients. 56 patients with liver function damage were enrolled in this study, The age, gender, season and severity of disease were statistically analyzed.

Results

102 cases of hospitalized patients were enrolled, male to female ratio was 2.29:1. The age of the patients was from 10 months to 12 years old, and the mean age was (4.75±2.82) years old. The largest number of cases is 3~7 years old group. The peak incidence of IM is autumn. There was significant difference between mild group and moderate group, severe group.

Conclusions

IM is mainly occurred in preschool children, especially in children aged 3 to 7 years old. The majority clinical manifestations of children is fever, cervical lymphadenopathy and angina. The clinical symptoms, physical signs, laboratory findings, and complications of the patients varied with age, but the prognosis was good. The level of liver function damage in children with IM was related to the age, season, duration of fever and severity of illness. Clinical treatment of IM is symptomatic support therapy and antiviral treatment. We should be attention to the case of serious complications, and should be regularly reviewed and followed up, diagnosis earlier and intervene the liver function damage.
THE LEVEL OF SERUM TNF-A IN INTRAVENOUS IMMUNOGLOBULIN NON-RESPONSIVE CHILDREN WITH KAWASAKI DISEASE
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Background and aims

Investigate the outcome of intravenous immunoglobulin (IVIG) therapy in 131 patients with Kawasaki Disease (KD), study serum TNF-a levels of in these patients, help pediatricians to identify KD patients with a higher risk of IVIG non-responsiveness, and explore further treatment of IVIG non-responsiveness.

Methods

KD patients were required to meet the following criteria: meet 2004 AHA diagnostic criteria, treatment with IVIG, and could participate in a long-term clinical follow-up. 131 patients with KD received initial IVIG therapy within 10 days. Patients were divided into a non-responsive group and a sensitive group, and their clinical experiences and outcomes were recorded. 28 healthy children and 16 febrile patients who were composed of acute upper respiratory infection were also recruited in this study. TNF-a concentrations are described as median (25%~75%), and p-values of <0.05 were considered statistically significant.

Results

1) 15.3% (20/131) patients fail to manifest an excellent clinical response. 2) The proportions of CAA (30.0% vs. 7.2%) in the non-responsive group was significantly higher than those in the sensitive group (p<0.01).

Conclusions

The high elevation of TNF-a levels existed in KD children. IVIG could allow serum TNF-a concentrations to reduce, but the level of TNF-a was continually elevated in the non-responsive group after initial IVIG therapy. IVIG non-responsiveness was an independent risk factor for cardiovascular complications. Thus, the non-responsive group needed additional IVIG therapy as soon as possible. Risk factors associated with the need for IVIG re-treatment include Male sex and the high level of TNF-a across the study.
LETHAL INFANT COMMUNITY-ACQUIRED PSEUDOMONAS AERUGINOSA PNEUMONIA
CLINICAL ANALYSIS
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Background and aims
To investigate the outbreak of deadly infant onset clinical and imaging characteristics of
Pseudomonas aeruginosa community-acquired pneumonia, in order to improve the early diagnosis
and treatment of the disease.

Methods
2013-2016 in Anhui province children’s hospital treated 4 cases of burst onset infants with community
acquired clinical and imaging of Pseudomonas aeruginosa. Histological features were retrospectively
analyzed in 4 cases, male 3 cases, female 1 cases, age < 1 years old, are warm seasons, 4 cases of
blood culture were Pseudomonas maltophilia.

Results
all 4 cases had fever, cough, progressive dyspnea, septic shock, and all of the pulmonary
hemorrhage, Leucocytopenia and CRP level higher than 100 mg/L was present in 4 cases in blood
routine examination, there were 3 cases of thrombocytopenia, The first patient and the second case
patient are failed to select sensitive antibiotics, death within a few hours, the third patient select
sensitive antibiotics because of the possibility of Pseudomonas aeruginosa was considered, but also
eventually died of multiple organ failure, the fourth case was discharged after treatment for 36 days.

Conclusions
the age is less than 1 years old characterized with rapid onset in the warm season, manifestations of
fever, rapid progression of dyspnea, pulmonary hemorrhage, sudden septic shock or leukocytopenia
with significantly elevated CRP, and a high degree of suspicion of infection with Pseudomonas
aeruginosa, bacterial culture, rational anti infection and supportive treatment immediately are the key
factors for the prognosis of the patients.
HUMAN BOCAVIRUS INFECTION IN CHILDREN WITH ACUTE LOWER RESPIRATORY TRACT INFECTION AND A COMPARISON STUDY OF THE CLINICAL CHARACTERISTICS

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Background and aims

To explore the epidemiology and clinical characteristics of acute lower respiratory tract infection (ALRTI).

Methods

Total 4370 children with clinical diagnosis of ALRTI during the period of March 2007 to February 2015 were enrolled into this study. These cases were hospitalized patients or outpatients in emergency department in Beijing Children’s Hospital. Each patient’s nasopharyngeal aspirate specimen was collected when admitted. The patients were divided into four groups, including <1 year old, 1 - <3 years old, 3 - <6 years old, and ≥6 years old. Reverse transcription (RT) PCR methods were used to detect common respiratory viruses including respiratory syncytial virus (RSV), human rhinovirus (HRV), parainfluenza virus (PIV) type 1-4, adenovirus (ADV), human coronavirus (HCoV), enterovirus (EV), human metapneumovirus (HMPV) and human bocavirus (HBoV). The incidence, epidemiological and clinical features of ALRTI with HBoV infection were analyzed. According to inclusion criteria, a comparison study of clinical features was carried out among three groups of pneumonia with single HBoV infections, with single RSV infection and with coinfection with RSV and HBoV.

Results

There were no significant differences in others clinical manifestations, complications and mechanical ventilation among these three groups.

Conclusions

1. Children under 3 years old were major population in children with ALRTI caused by HBoV infection.
2. HBoV infection was sporadic throughout a year with high coinfection rate.
3. HBoV infection could result in pneumonia in children. The incidence of dyspnea in group with HBoV and RSV coinfection was higher than that of in groups with single HBoV infection or single RSV infection.
BACKGROUND AND AIMS

To summarize the clinical characteristics of invasive pulmonary fungal infection (IPFI) with leukemoid reaction.

METHODS

A retrospective analysis of the clinical data of a patient with IPFI complicated with leukemoid reaction and literature review.

RESULTS

A patient, female, 7 months old, because of pneumonia that was treated with antibiotics, glucocorticoid ineffectively in other hospital. Then she was given mechanical ventilation and then was transferred into our hospital. After being treated with broad-spectrum antibiotics, the condition was improved once, and the ventilator was withdrawn. Later, the symptoms repeated. Blood and sputum culture had aspergillus growth. Lung CT had increased the density of the subpleural nodules consolidation shadows, and empty or crescent air sign. Diagnosis of IPFI was established. During hospitalization the WBC in peripheral blood occurred more than 50×10^9 / L, because of no bone marrow leukemia cells, diagnosis of leukemoid reaction, given antifungal treatment, clinical symptoms such as fever, cough were reduced, and lung CT showed pulmonary cavity had disappeared.

CONCLUSIONS

IPFI is mainly due to the severe degree of basic diseases, and the patients with long time of mechanical ventilation, antibiotics and glucocorticoids can have concurrent leukemoid reactions. In clinical work, clinical should be combined with laboratory examination to prevent, early diagnose and treat IPFI.
SUCCESSFUL TREATMENT OF MUCORMYCOSIS-INFECTED LIVER ABSCESS IN A CHILD WITH ACUTE MYELOID LEUKEMIA USING ITRACONAZOLE AND AMPHOTERICIN B

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Background and aims

The survival of patients with hematologic malignancies has been improved for aggressive chemotherapy nowadays, however its incident of secondary infection including fungus increased and some death cases were frequently reported. We report a case of mucormycosis liver abscesses in a patient with acute myeloid leukemia (M2b).

Methods

A 5-year-old boy was admitted to hospital because of relapse of acute myeloblastic leukemia and received regular chemotherapy. During process of Homoharringtonine and Cytarabine he was found fungus pneumonia according to the characteristic of pulmonary CT and voriconazole was given. One month later the liver abscess was observed while reexamination and he was stroke by sudden fever. The CRP rose to 97.4mg/L with WBC normal and liver lesion was 67×64×61mm by ultrasonography. He was suspected of having a complication of liver abscesses and percutaneous liver biopsy was performed and tissue pathology showed majority mucors and minority monilia. Then antifungal monotherapy of itraconazole and liposomal amphotericin B (1mg/kg/d) was administered. The temperature normal three days later. Two abdomen CT scan were performed during one-month hospitalization and the liver lesion were observed small.

Results

After departure the child received itraconazole for another month and drug was discontinued without doctor consent. Two months later until now, the only ultrasound showed the liver lesion waned but not diminished with no uncomfortable.

Conclusions

Our clinical experience suggests that child cancer patient with long-term chemotherapy is at high risk of liver fungus infection if fungal pneumonia is present. Combination of anti fungal therapy is effective in mucor infection.
THE CHANGES OF T LYMPHOCYTE AND IMMUNOGLOBULIN IN CHILDREN WITH SEVERE HAND, FOOT AND MOUTH DISEASE

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Background and aims

Objective: To investigate the levels and effects of peripheral blood subgroup of T lymphocyte and immunoglobulin on Critically ill children with hand, foot and mouth disease.

Methods

We adopted prospective clinical study, Divided into the case group and control group, Control group of the same period age-matched healthy children. case group from of February 2013 - November 2013 patients with severe hand, foot and mouth disease in our hospital intensive care unit. According to its severity is divided into intensive and critical care group. children were take blood immediately afterhospitalization. The percentage of total T cells(CD3+), Th cells (CD4+), Ts cells (CD8+), NK cells, B cells and the ratio of Th/Ts(CD4+/CD8+) and the immunoglobulin (IgA, IgG and IgM) levels were analysed.

Results

Of 98 kids with hand foot and mouth disease were divided into severe group (52 cases) and serious group (46 cases). Compared with control group, the level of CD3 +, CD4 +, CD8 +, IgM, NK cells of severe group were significantly reduced (P < 0.05), the B cells increased significantly (P < 0.05); the level of CD4 +, CD4 + / CD8 +, IgA, IgG, IgM of serious group were significantly difference compared with the control group and the severe group. The level of CD3 +, CD8 + and NK cells, B cells of serious group compared with control group, were significantly increased (P < 0.005), but there was no statistically significant difference compared with severe group.

Conclusions

the hand foot and mouth disease might disordered the immune function of kids and lower the cell immune response.
CLINICAL ANALYSIS OF HEPATIC DYSFUNCTION IN KAWASAKI DISEASE
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Background and aims
Kawasaki disease (KD) is also classified as mucocutaneous lymph-node syndrome. KD is an acute systematic vasculitis and affects medium-sized muscular arteries throughout the body. The vasculitis developed not only in coronary, but also in abdomen. Recently abnormalities of liver panel were frequently documented in KD. Our studies aimed to analyze the clinical characteristics of KD patients and their treatment outcome.

Methods
We retrospectively reviewed the medical records of all KD patients admitted between 2009 and 2017. The liver panel test included alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma glutamyl transferase (γ-GT), and bilirubin. These patients were divided into 2 groups. Those with one or more abnormal liver function were in abnormal group.

Results
249 patients with KD reviewed all had the liver function test. One hundred and six (42.5%) had one or more abnormal liver panel test. Patients in the abnormal group were more likely complicated with abdominal distention and intestinal obstruction ($P=0.04$) and were more likely have the coronary abnormalities ($P=0.01$). There was no significant difference between groups in the febrile time, C-reactive protein and albumin level. The abnormal group was more likely to have intravenous immunoglobulin (IVIG) resistance ($P=0.01$). Multivariate analysis identified total bilirubin as significant predictors for the coronary abnormalities and IVIG resistance.

Conclusions
The abnormalities of liver function panel were frequently found in patients with acute KD. The children with hepatic dysfunction (especially elevated total bilirubin) were at higher risk for coronary abnormalities and IVIG resistance.
DIAGNOSIS AND TREATMENT OF INFANT CYTOMEGALOVIRUS INFECTION

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Background and aims

The cytomegalovirus (CMV) is a double-stranded DNA virus and belongs to the herpes virus family. According to the timing of primary infection, CMV infection is divided into: congenital infection (confirmed to have CMV infection within 14 days after birth), perinatal infection (there was evidence of CMV infection within 3-12 weeks, while no infection within 14 days after birth), acquired infection (confirmed to have CMV infection after 12 weeks). As for immunocompromised neonate or infant, CMV infection is one of the major causes of congenital defects, and may even cause life-threatening diseases, so it is very important to standardize the diagnosis and treatment of infant cytomegalovirus infection.

Methods

We collected clinical data of patients who were diagnosed cytomegalovirus infection in our department from January 2007 to January 2017.

Results

From January 2007 to January 2017, 75 hospitalized patients in our department were diagnosed as CMV infection (female 25), congenital infection in 3 cases (4%), perinatal infection in 44 cases (59%), acquired infection in 28 cases (37%). 44 patients with elevated liver enzymes (65%), 7 patients with blood system involvement (mainly manifested as thrombocytopenia), 7 patients with hearing impairment (9%) and 4 patients with CMV pneumonia 4 (5%). For those who refused Ganciclovir antiviral therapy have continued viral replication and elevated liver enzyme, poor response to symptomatic treatment.

Conclusions

Diagnosis and treatment of CMV infection is more standardized in our department, and for patients who meet the indication of antiviral therapy, standardized anti-viral treatment can effectively shorten the course of disease, reduce organ involvement.
A RAPID AND ACCURATE METHOD TO EVALUATE HELICOBACTER PYLORI INFECTION FROM GASTIC MOCUSA IN CHILDREN

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Background and aims

To explore a rapid and accurate method to evaluate Helicobacter pylori infection from gastric mocusa in children.

Methods

20 gastric mucusas were taken from 20 young children who were undergoing gastric discomforts. PCR was used to detect the HP infection by CSTP, HP-16s, urea C, cag 595 and cag750 genes of H pylori. At the same time, the patients also took the 13-C test or blood HP-Ab test. Gathering the test results and analyze them.

Results

The positive rate of HP-16s was 70% while the CSTP and urea C were 25%. The positive rate of HP-Ab or 13-C test was 40% at all.

Conclusions

Detecting HP by PCR is a rapid and accurate method.
THE ASSOCIATION BETWEEN MITOCHONDRIAL F1F0-ATP SYNTHASE AND THE ORGAN FUNCTION IN CHILDREN WITH SEPSIS

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Background and aims

To explore the difference of Mitochondrial F1F0-ATP synthase activity between children with sepsis and healthy children, and to assess the relationship between the activity of F1F0-ATP synthase and organ functions.

Methods

1. 91 septic children treated in ICU of Children’s Hospital Affiliated to the Capital Institute of Pediatrics and 90 healthy children were enrolled in the study from September 2013 to December 2015. 2. The activity of Mitochondrial F1F0-ATP synthase in peripheral blood leukocyte was measured when the diagnosis of sepsis was established and healthy children was on the day for health examination. The differences were assessed between the two groups.

Results

1. There were 181 children enrolled in the study, 118 boys and 63 girls. The average age was 2.5 years, range from 0.1 to 14 years; There were no significant differences in mean age and gender between septic group and healthy group (P>0.05); 2. The sepsis group was divided into different dysfunctions groups and Non-dysfunctions groups according to whether the patients had a kind of organ dysfunctions or not, including MOF, liver dysfunctions, gastrointestinal dysfunctions, Coagulation dysfunctions, brain dysfunctions and metabolize dysfunctions. The average activity of the dysfunctions group was significantly lower than that of the Non-dysfunctions group (P<0.05);

Conclusions

The activity of Mitochondrial F1F0-ATP synthase in septic group was significantly lower than that of the control group. There is significant association between the Mitochondrial F1F0-ATP synthase activity and organ functions in septic children. Low level of mitochondrial F1F0-ATP synthase activity may be a predictor of organ dysfunction in sepsis.
DIFFERENTIAL DIAGNOSTIC VALUE OF HEMORGRAM AND CRP IN CHILDREN WITH ACUTE UPPER RESPIRATION TRACT INFECTION

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Background and aims

To investigate the differential value of hemogram and C-reactive protein(CRP) in etiological diagnosis of early acute upper respiration tract infection.

Methods

1200 cases with first-diagnosis AURI were randomly selected as observation group. They went and saw the doctor to our hospital from May 2016 to April 2017. Get sick within 24 hours. No antibiotic was applied. During the same period, 200 cases were randomly selected as control group. They came to our hospital for physical examination. All the children, the ages ranged from 1 to 6. The two groups of white blood count and its classification and CRP levels were compared and analyzed. In the observation group, antibiotic application was analyzed retrospectively and the prognosis of the disease was followed up.

Results

Compared with the control group, the difference in the hemogram and CRP were statistically significant. There was a positive correlation between the hemogram and the CRP in the observation group. The percentage of neutrophils and CRP increased in the observation group. Antibiotic use rate was 66%.

Conclusions

In the observation group, patients with significantly elevated percentage of neutrophils and CRP could be cured with the antibiotics in 3-5 days. Therefore, that the hemogram and CRP is of definite differential value for children with AURI in etiological diagnosis.
Background and aims

This study aimed to explore the epidemiology of pathogens in children who were hospitalized with lower respiratory tract infections (LRTIs) at the Children’s Hospital.

Methods

Children aged less than 18 years who were hospitalized with LRTIs were recruited from January 2013 to December 2015. Respiratory specimens were collected for the detection of common respiratory viruses, atypical bacteria and bacteria using current laboratory diagnostic tests. The epidemiological characteristics of the respiratory pathogens were analysed.

Results

Of the 10,123 specimens obtained from the patients, 5,966 (58.7%) were positive for at least one pathogen. *Mycoplasma pneumoniae* was the most commonly detected pathogen (15.7%), followed by respiratory syncytial virus (RSV) (13.9%). Co-infections were found in 11.4% of patients. Of these co-infections, viral-bacterial co-infections were the most common. The detection rates for the respiratory pathogens varied considerably by age. RSV was the most common pathogen in children aged less than 24 months. Clear seasonal peaks were observed for RSV, *M. pneumoniae*, para-influenza virus (PIV), human metapneumovirus (hMPV), *Moraxella catarrhalis* and *Haemophilus influenzae* infections.

Conclusions

Various pathogens lead to LRTIs in children in Shanghai, China. Different pathogens demonstrated different epidemiological patterns with respect to seasonal and age distributions.
EFFICACY OF LANQIN ORAL LIQUID, IN ADDITION TO CONVENTIONAL THERAPY, FOR THE TREATMENT OF MILD HAND-FOOT-MOUTH DISEASE: A RANDOMIZED DOUBLE-BLIND CONTROL TRIAL IN A CHINESE TERTIARY HOSPITAL

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Background and aims: The guidelines for diagnosis and treatment for Hand-Foot-Mouth Disease (HFMD) published by National Health and Family Planning Commission of China in 2010 recommends the Chinese traditional herb, Lanqin oral liquid, for the treatment of mild HFMD cases. However, the recommendation was not based on high-quality evidence. The objective of this study was to investigate the efficacy of Lanqin, in addition to conventional therapy, in treatment of mild HFMD.

Methods: All eligible children were recruited from May 2016 to May 2017 with admission diagnosis of mild HFMD in Pediatric department of a tertiary hospital. A third party was assigned to do the randomization and sent the trial identification number to researcher for allocation. A total of 187 patients, aged 1-8 years, were randomly assigned into control or intervention (with Lanqin prescription) group. Patients in both groups received conventional therapy for 7 days, including antipyretic, fluid replacement, and maintenance of water-electrolyte balance. Duration of fever (hour), clearance of rashes (day), duration of hospital stay (day), and risk of developing into severe cases were observed.

Results: There were 103 patients in the control group and 84 in the intervention group. There was no significant difference in age or gender between the groups. Compared to the control group, the intervention group had shorter duration of fever and shorter time for clearance of rashes (10.2±4.8 vs.11.1±6.6 for fever duration, and 5.68±1.4 vs.5.73±1.5 for clearance of rashes), but not significantly (P>0.05). The median length of hospital stay in both groups was 4 days. There was no significant difference in risk of developing into severe HFMD between two groups (P>0.05). No adverse effect of Lanqin was observed during the trial.

Conclusions: Shorter duration of fever and clearance of rashes (without statistical significance) in mild HFMD was observed with Lanqin therapy in mildly affected cases. Lanqin did not prevent development of mild to severe HFMD.
HUMAN ADENOVIRUS RESPIRATORY TRACT INFECTION AMONG HOSPITALIZED CHILDREN IN SHENZHEN, CHINA

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Background and aims

The data of epidemiology, clinical features, inflammation markers, managements of children with adenovirus respiratory infection in developing country is rare. The aim of this study is to collect the data from children with adenovirus respiratory tract infection admitted in hospital in Southern China.

Methods

179 children with adenovirus respiratory tract infection confirmed by nasopharyngeal swab direct immunofluorescence antigen admitted to Shenzhen children's hospital, Southern China, from December 5, 2009 to July 13, 2013. 79 patients were diagnosed as pneumonia by radiology. The underlying conditions, epidemiology, clinical presentations, types of adenovirus, managements and outcomes of these children were retrospectively analyzed.

Results

The commonest presentation was cough (n=179, 100%), followed by fever (n=165, 92.2%), wheezing (n=48, 26.8%) and tachypnea (n=31, 17.3%). Among 179, Leucocytosis (WBC > 10×10^9/L) in 101 (56.4%) and increased level of C-reactive protein in 102 (57%) were investigated. Adenovirus 3 (30.7%) and adenovirus 7 (18.4%) were the predominant types. 168 (93.9%) patients received antibiotic therapy. 178 (99.4%) among all of patients were improved and one (0.6%) was dead. 1 (0.6%) developed bronchiolitis obliterans and 1 was diagnosed as mild lung fibrosis by radiology.

Conclusions

Changes of inflammation markers including total white blood cell count, C-reactive protein were similar to bacterial infections. Antibiotic use in high proportion was inappropriate.
ANALYSIS OF MISDIAGNOSED CASES OF HEMORRHAGIC FEVER WITH RENAL SYNDROME IN CHILDREN: REPORT OF TWO CASES

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Background and aims

Hemorrhagic fever with renal syndrome (HFRS) is an acute disease caused by Hantavirus infection and clinically characterized by fever, various hemorrhagic manifestations and transient renal and hepatic dysfunction. The typical disease progresses contain five phases: febrile, hypotensive, oliguric, diuretic, and convalescent. Hantavirus infection is a global problem, while about 90% of the world's cases are reported in China. Clinically reported HFRS is very rare in childhood. With atypical manifestation, HFRS in children are always misdiagnosed. The purpose of this study was to analyze the causes of misdiagnosis of HFRS.

Methods

This paper adopted 2 cases of misdiagnosed cases which are representative from Pediatric Department of Nephrology in First Hospital of Jilin University. We analyzed the cause of misdiagnosis through the observation of the children's mode of onset, clinical manifestations, accessory examination and prognosis.

Results

in case 1, the girl had fever, cough, edema and oliguria, with a elevated levels of usea nitrogen, creatinine, and mild proteinuria, microscopic hematuria, a decreased levels of C3. We got a conclusion: Acute glomerulonephritis. In case 2, the girl was misdiagnosed as encephalitis at local hospital. She did have headache, orbital pain and thrombocytopenia, but she also had splenomegaly and heteromorphic lymphocyte. Even the infectious disease department did not consider HFRS first. Both of the two cases were diagnosed until hantavirus infection was proven serologically.

Conclusions

The clinical manifestations of children with HFRS are atypical accompanying multiple complications, that are the main cause of misdiagnosis.
THE ASSOCIATION BETWEEN THE QUANTITATIVE VALUE OF REAL-TIME PCR OF MYCOPLASMA AND THE CLINICAL MANIFESTATIONS IN MYCOPLASMA PNEUMONIAE IN CHILDREN

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Background and aims

Mycoplasma pneumonia is very common in school-aged children and adolescents, which accounts for approximately 10-30% of all community acquired pneumonia. But the clinical manifestation varies a lot. Pathogen invading and the overwhelming immune response are both important factors in the pathogenesis of Mycoplasma pneumonia. The main goal of this study is to investigate the relationship between the severity of clinical manifestations and the quantitative value of Real-time PCR of Mycoplasma.

Methods

We retrospectively enrolled 597 hospitalized patients diagnosed as Mycoplasma pneumonia to investigate the relationship between the quantitative value of Real-time PCR of Mycoplasma and patient’s fever duration, fever pattern, tachypnea, wheezing, chest pain, atelectasis, pleural effusion, and the frequency of corticosteroid treatment. We used multiple statistical ways such as t-test, one-way ANOVA, and multiple linear regression to do the statistical analysis.

Results

The P values are 0.468, 0.357, 0.794, 0.586, 0.372, 0.873, 0.694, 0.556, 0.107, 0.998 and 0.573 respectively. Our data showed that there was no statistical significance between the severity of clinical manifestations and the quantitative value of Real-time PCR of Mycoplasma in Mycoplasma pneumonia patients.

Conclusions

This reminds us to pay more attention to the overwhelming immune response during the process of pathological lesion in Mycoplasma pneumonia.
STUDY ON THE CORRELATION BETWEEN CELLULAR IMMUNE RECONSTITUTION AND INFECTIOUS DISEASES AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN

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Background and aims: Infection is a common complication after allogeneic hematopoietic stem cell transplantation, affecting the quality of life and survival rate of children. This study investigated the effect of cellular immune reconstruction on infectious diseases after transplantation.

Methods: The T cell subsets of 20 patients aged 1-18 years were monitored after one, three, six, nine, twelve month of allogeneic hematopoietic stem cell transplantation.

Results: The immune reconstitution of CD4+ cells is later than that in CD8+ cells. After transplantation, CD4+/CD8+ were significant differences between infection and non infection group.

Conclusions: CD4+ may rely on the thymus pathway for immune reconstitution. The delayed immune reconstitution of CD4+ cells is an important factor affecting the occurrence of infectious diseases after transplantation.
Fecal microbiota transplantation for pediatric recurrent Clostridium difficile infection treatment and the intestinal microbial composition analysis

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Background and aims

FMT can successfully treat recurrent clostridium difficile infection (RCDI). Our aim is to evaluate the clinical efficacy of fecal microbiota transplantation on children with recurrent clostridium difficile infection (RCDI) and explore microbial composition.

Methods

6 patients diagnosed as RCDI and treated with FMT at Shanghai Children’s Hospital between 2014 and 2016 were evaluated. 16S rRNA sequencing was used to analyze the microbial composition of 4 RCDI children before and after FMT.

Results

Among 6 patients, 4 were male. 2 children received a single FMT treatment and achieve clinical remission; 4 children were treated with multiple FMT in order to achieve clinical remission. Single FMT success rate was 33%. All patients had no severe side effects either during the FMT or after FMT. At the phyla, class, order, family, and genera levels, the original patients’ microbiota had low diversity. At the family level, Fecal samples of RCDI patients were rich in members of the Enterobacteriaceae, however, the Bacteroidaceae and Ruminococcaceae were poor. At the genera level, increased abundance of klebsiella and erwinia, and decreased abundance of Bacteroides, Faecalibacterium and Sutterella were observed. Samples taken after each transplant demonstrated quick remodeling towards the donor’s sample composition coinciding with symptom resolution, and these communities remained stable in each patient.

Conclusions

FMT can be used to treat children with RCDI, and it is safe and tolerant. The diversity of the intestinal microbiome in children with RCDI decreased. FMT can significantly increase the diversity of the intestinal microbial composition in children with RCDI.
Clinical Characteristics of 23 Children with Orbital Cellulitis and Literature Review

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Background and aims

Background and Objective: To summarize the clinical features and discuss the common pathogens in orbital cellulitis.

Methods

Methods: Retrospective study of the clinical features and common pathogens of 23 orbital cellulitis cases, which were admitted to Beijing Children's Hospital affiliated to Capital Medical University from 2014 to 2016.

Results

Results: Most orbital cellulitis occurred in winter and spring. All of the patients were under 5 years old, averaged 3.7 years old. 13 patients were male and 10 patients were female. The average hospitalization time of was 13.5 (4-32) days. 3 routes of transmission were observed: spread of infection around the orbital tissue (74%), bloodstream infection (22%) and trauma (4%). According to radiology examination, 4 cases (17%) were preseptal orbital infection and 19 cases (83%) were orbital cellulitis (deep orbital). On admission, the average count of WBC (neutrophile dominant), CRP and ESR were increased significantly. Pathogen culture of 21 cases was conducted using blood, secretion or pus. The number of positive culture was 9 cases, the most common pathogens were Staphylococcus (MRSA), coagulase-negative staphylococcus (staphylococcus epidermidis), staphylococcus simulans and Streptococcus (streptococcus pneumonia, streptococcus constellatus, Streptococcus viridans). All patients were given intravenous antibiotics. 3 patients received surgical treatment. The condition of all patients improved by discharged.

Conclusions

Conclusions: Orbital cellulitis was most prevalent under the age of 5. Early phase empirical antibiotic treatment should cover Staphylococcus and Streptococcus. Early etiological investigation and treatment is the key to the prevention of severe complications.
ASSOCIATION OF POLYMORPHISMS IN INTERLEUKIN-12/INTERFERON-GAMMA PATHWAY GENES WITH SUSCEPTIBILITY TO ENTEROVIRUS 71-INFECTED HAND, FOOT, AND MOUTH DISEASE

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Background and aims

Over the past two decades, the number of cases of hand, foot, and mouth disease (HFMD), which may cause disability and death (especially for enterovirus 71-infected (EV71) HFMD), has escalated dramatically. This study aimed to investigate polymorphisms in the genes of the IL-12/IFN-γ pathway and their interactions with susceptibility to EV71-infected HFMD.

Methods

This prospective study was conducted in 145 patients with EV71-infected HFMD, 104 children with EV71-infected recessive infections, and 89 healthy controls. Serum EV71 IgG and IgM were measured by ELISA. Six single nucleotide polymorphisms (SNPs) in IL-12RB1 (rs12461312, rs17882555, rs1870063, rs2305740, rs2305741, and rs3746190), one in IFNGR2 (rs9808753), and one in STAT4 (rs11676659) were detected by the imLDR™ assay.

Results

The genotype and allele distributions of the eight SNPs were different between EV71-infected HFMD patients and healthy controls (all P<0.05), except the allele distribution of STAT4 rs11676659 (P=0.063). There were no significant differences in genotype and allele distributions of the eight SNPs between EV71-infected recessive infections and healthy controls (all P>0.05). The GCGCAG (rs3746190(A/G), rs12461312(A/C), rs17882555(A/G), rs1870063(C/T), rs2305740(A/G), rs2305741(A/G)) of IL12RB1 was a high-risk haplotype associated with EV71-infected HFMD (P=0.017; OR: 2.116; 95%CI: 1.131-3.956).

Conclusions

These results could suggest that polymorphisms of IL-12RB1, STAT4, and IFNGR2 could be involved in the susceptibility to EV71-infected HFMD.
RISK FACTORS FOR CARBAPENEM-RESISTANT K. PNEUMONIAE BLOODSTREAM INFECTION AND PREDICTORS OF MORTALITY IN CHILDREN

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Background and aims

Bloodstream infection (BSI) caused by Carbapenem-Resistant K. pneumoniae (CRKP) are associated with high rates of morbidity and mortality, and are hard to treat. Early identification of patients at highest risk is very important. The aim of this study was to evaluated risk factors for CRKP BSI and for K. pneumoniae BSI-related death among pediatric patients.

Methods

From January 2011 to December 2014, a case-control study was conducted at Beijing Children’s Hospital, China. Patients with BSI caused by K. pneumoniae were identified from the microbiology laboratory database. Data were collected from medical records.

Results

A total of 138 patients with K. pneumoniae BSI were enrolled, including 54 patients with CRKP BSI and 84 patients with Carbapenem-Susceptible K. pneumoniae (CSKP) BSI. Most of the BSI (114; 82.6%) were health care associated, while the rest (24; 17.4%) were community-acquired. Hematologic malignancies (odds ratio (OR):4.712, 95% CI: [2.181-10.180], P<0.01) and previous cephalosporins administration (OR: 3.427, 95% CI: [1.513-7.766], P<0.01) were independent risk factors for CRKP BSI. 28-day mortality of K. pneumoniae BSI was 8.7%. Mechanical ventilation (OR: 9.502, 95% CI: [2.098-43.033], P<0.01), presentation of septic shock (OR: 6.418, 95% CI: [1.342-30.686], P<0.05), and isolation of CRKP (OR: 9.171, 95% CI: [1.546-54.416], P<0.05) were independent risk factors for the 28-day mortality of K. pneumoniae BSI.

Conclusions

Our study suggests that hematologic malignancies and previous cephalosporins administration were associated with the development of CRKP BSI, and patients’ physical conditions were independent mortality predictor. More attention should be paid to CRKP BSI in the pediatric population.
STUDY ON EARLY WARNING FACTORS OF INTESTINAL MUCOSAL BARRIER FUNCTION IN SEVERE HAND, FOOT AND MOUTH DISEASE

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Background and Aims
To analyze the changes of levels of plasma diamineoxidase (DAO), D-Lactate and endotoxin in children with severe hand, foot and mouth disease (HFMD), exploring the changes of intestinal mucosal barrier function in children with severe HFMD and investigating the sensitivity of the indexes described previously on the damage of intestinal mucosal barrier.

Methods
170 children with severe HFMD were selected as severe case group in Xi'an children's Hospital from June 2016 to June 2017, and 200 children with mild HFMD were randomly selected as mild case group, in the same period, 150 healthy children were served as healthy control group. The blood samples were collected on the next day after admission. The levels of endotoxin, DAO and D-Lactate in the plasma were detected respectively by improved chromomeric substrate azo, improved method of o-dianisidine agent and enzymologist spectrophotometers. SPSS 17 software was used for statistical analysis.

Results
The level of D-Lactate (29.94 + 6.52mg/L) in severe case group is significantly higher than that in mild case group (26.31 + 5.55mg/L), and show significant difference (t=5.785, P=0.044), but have no significant difference between mild case group (26.31 + 5.55mg/L) and healthy control group (25.59 + 5.18 mg/L). There are no significant difference of the levels of endotoxin (1.26±0.49U/L vs 1.17±0.43U/L vs 1.12±0.45U/L, P>0.05) and DAO(3.53±1.75U/L vs 3.31±1.06U/L vs 3.28±1.23U/L, P>0.05) in the three groups.

Conclusion
Children with severe HFMD have increased intestinal permeability and impaired intestinal mucosal barrier function. D-Lactate increased significantly in the early stage of intestinal barrier damage, compared with DAO and endotoxin, D-Lactate is a sensitive index of impaired intestinal mucosal barrier function.
BIOLOGICAL AND CLINICAL CHARACTERS OF RESPIRATORY SYNCYTIAL VIRUS IN CHILDREN WITH BRONCHIOLITIS IN BEIJING IN TEN CONSECUTIVE YEARS, 2006-2016

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Background and aims

To investigate the clinical characters of respiratory syncytial virus (RSV) bronchiolitis and molecular biological characters of RSV in children in Beijing.

Methods

In a systematic retrospective study, 2296 nasopharyngeal aspirates (NPA) were collected from children diagnosed with bronchiolitis from July 2006 to June 2016. For specimens positive for RSV, subgroup A or B was confirmed and genotype of RSV was determined. Clinical data were evaluated by the modified Tal score to compare the severity between RSV subtypes, as well as genotypes.

Results

In 2296 bronchiolitis cases, 961 (41.9%) were RSV positive. The dominant RSV subtype changed from year to year: A-A-B-A-B-AB-A-AB and more bronchiolitis cases were identified in RSV A dominant years. The dominant genotypes of RSV A were NA1 (55.9%) with high rates (50.0%~100%) before 2014 and ON1 (39.1%), mainly detected after 2014, while BA9 (90.6%) was the absolute dominant RSV B genotype. No significant difference in the severity of bronchiolitis was shown between cases of RSV A and B. Children positive for NA1 were more likely to stay longer in hospital compared to that group positive for ON1 (U=1.035, P=0.005) and had higher proportion of moderate to severe degree symptoms compared with ON1 group (U=9.785, P=0.008). In the group positive for ON1, more children were with fever (c²=11.064, P=0.001) and more were younger than 3 months (c²=77.408, P<0.001)

Conclusions

The dominant RSV subgroup changed from year to year with a shifting pattern. The correlation between RSV genotypes and the severity of disease was documented in the study.
CLINICAL ANALYSIS OF 8 NEONATAL HAND-FOOT-MOUTH DISEASES

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Background and aims

To study the clinical features, treatment and prognosis of neonatal hand-foot-mouth disease.

Methods

Neonatal hand-foot-mouth disease patients admitted from July 2014 to May 2016 were respectively studied. EV71, CA16 and universal enterovirus were detected from newborn swabs by RT-PCR.

Results

A total of 8 neonatal hand-foot-mouth diseases patients, 6 boys and 2 girls, were diagnosed, their age ranged from 7-26 days. 7 patients had exposure history. Clinical manifestations including rash (8 cases), fever (6 cases), irritability (4 cases) and vomiting (1 case), no body suffered convulsions or convulsions. The results of RT-PCR showed the aetiology was universal enterovirus excluding the EV71 and CA16. 5 cases had pulmonary infection with antibiotic therapy. All of the 8 cases had a good prognosis.

Conclusions

Most of the hand-foot-mouth diseases had exposure history, with no special clinical manifestations, they had intestinal virus infection but excluding the EV71 and CA16, some patients had pulmonary infection. Therefore neonatal hand-foot-mouth diseases need more clinical attention and should be centralized management.
ACYCLOVIR TREATMENT IN INFECTIOUS MONONUCLEOSIS: A CASE-CONTROL STUDY
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Background and aims

To evaluate whether acyclovir affects fever time and length of hospital stay among patients with infectious mononucleosis.

Methods

A retrospective analysis of 100 patients with infectious mononucleosis between January and December in 2016 from Shenzhen Children’s Hospital was collected. Statistical analysis was used to compare the fever time and length of hospital stay between the acyclovir group (50 patients) and the control group (50 patients).

Results

With regard to fever time and length of hospital stay, there is no significant difference between the acyclovir group and the control group (P>0.05)

Conclusions

Acyclovir was not correlated to fever time and length of hospital stay of patients with infectious mononucleosis.
HUGE AND ISOLATED CEREBRAL ABSCESS IN A CHILD WITH ACUTE LEUKEMIA—
CEREBRAL MUCORMYCOSIS
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Background and aims

Isolated CNS mucormycosis is very rare and have a high mortality. We describe a patient with a huge and isolated cerebral abscess in a child with acute leukemia. To our knowledge, this is the largest isolated cerebral abscess of mucormycosis and have a good prognosis.

Methods

We collected the patient’s clinical material and follow-up for one year.

Results

A 4-years-old girl had been diagnosed with acute leukemia for 56 days before admission, and during chemotherapy she got myelosuppression, aphasia and the right hemiplegia for about 20 days before. After 10 days of admission, she got severe headache, brain CT show a large cystic lesion, with irregular edge intensity. After 18 days, the lesion enlarged, even oppress the brain stem. After 22 days, she received surgical debridement of brain abscess. After 27 days, the endoscopic-biopsy specimen shows “acute, necrotizing, granulomatous inflammation and large clusters of fungal organisms in the necrotic tissue and vascular cavity, the fungi had broad, sparsely septated hyphae that branched at right angles”. The morphologic features of the fungus were most consistent with mucormycosis. Amphotericin B and Posaconazole were used as systemic antifungals. Before that, repeated culture for peripheral blood, CSF and drainage fluid were negative, G and GM tests were negative, and we had used voriconazole for more than one month. After one year of follow-up, the patient ended her chemotherapy, the nervous system symptoms disappear and her cerebral image gradually recover.

Conclusions

Mucorales have a strong tropism for invasion of blood vessels, resulting in tissue infarction and necrosis.
A CONTROLLED CLINICAL STUDY OF SEQUENTIAL COMBINATION THERAPY OF INTERFERON AND LAMIVUDINE IN CHILDREN WITH IMMUNE-TOLERANT CHRONIC HEPATITIS B

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Background and aims

To prospectively study the efficacy, safety and related factors of sequential combination therapy of IFN and LAM in children with immune-tolerant CHB.

Methods

46 children with CHB (ALT <60 U/L) between 1~15 years of age, participated in this study. They received with IFN alone (3 MU/m2~5 MU/m2 ,qod) for 12 weeks followed by IFN plus LAM (if HBVDNA declined <2log10) for another 60 weeks, LAM alone continued for 24 weeks during follow-up. Twenty-three cases of immune-tolerant CHB children free of treatment were involved as a control group.

Results

In the treatment group, at 96 week HBeAg seroconversion was achieved in 15(32.6%) cases. Ten (21.7%) cases achieved HBsAg clearance. In control group only 1 case achieved undetectable HBV DNA, 1 case had HBeAg seroconversion.

At week 96 , HBeAg seroconversion rate was 45.5% and 20.8% in 1~7 and 7~15 year old group(P=0.075); and HBsAg clearance rate was 36.4% and 8.3% in 1~7 and 7~15 year old group(P=0.021). HBeAg seroconversion rate was 5.6% and 50% in patients with normal ALT and abnormal ALT(p=0.005); HBsAg clearance rate was 5.6% and 32.1% in patients with normal ALT and abnormal ALT(P=0.077).

Multiple logistic regression analysis revealed the seroconversion rate of HBeAg was correlated with non-MTCT transmission and abnormal ALT level; HBsAg clearance rate was correlated with the age of children.

Conclusions

Using IFN for children no serious adverse effects were observed.
Children with immune-tolerant CHB under the age of 7 years and mild abnormal ALT could achieve HBsAg clearance and HBeAg seroconversion with antiviral therapy, and possesses good safety.
THE RELATIONSHIP BETWEEN RHINOVIRUS AND RECURRENT WHEEZING

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Background and aims

Early studies showed that Respiratory Syncytial Virus (RSV) was the main trigger of wheezing in infants. New evidences indicated that rhinovirus (RV) may play a significant role in the development of asthma.

The purpose of this study was to assess virus etiology of recurrent wheezing and without wheezing children, and to instigate the signs between RV infection and other virus infection in wheezing children.

Methods

A total of 109 children with recurrent wheezing and 70 controls without wheezing were recruited between October 2013 and March 2015. RV, Human metapneumovirus (hMP), Bocavirus (BoV) were tested by reverse transcription-polymerase chain reaction from nasopharyngeal aspirate. Respiratory syncytial virus (RSV), parainfluenza virus, influenza virus and adenoviruses was (ADV) confirmed by detection of viral antigens via fluoroimmunoassay.

Results

The viral infection was more common in recurrent wheezing children than that in controls (odds ratio [OR] 6.10; 95%[CI] 2.89-12.87). RV infection was commonly detected both in wheezing children and controls, however RV was more found in wheezing children than in controls (OR 3.07; CI 1.37-6.90), followed by RSV (OR 5.33; CI, 1.53-18.62). Compared with other virus, RV was more tend high blood eosinophil in wheezing children (P<0.05). The percentage of RV positive was highest in toddlers in children 5 years and younger.

Conclusions

Respiratory viral infections, especial RV, are commonly in recurrent wheezing children. RV infection is may relative with eosinophilia. This virus can be tend infect in toddlers.
Background and aims

Antimicrobial surveillance data is essential as a part of antibiotic stewardship program and assessment of the appropriateness of prescriptions. This study aimed to describe rate and pattern of antimicrobial prescriptions in neonatal care units at King Chulalongkorn Memorial Hospital (KCMH).

Methods

A standardized one-day cross sectional point prevalence survey (PPS), which is a part of the Global Antimicrobial Resistance, Prescribing, and Efficacy among Neonates and Children (GARPEC), was conducted for 6 rounds from January to June 2016. We included all neonates receiving an antimicrobial at 8:00 am on the day of the PPS. Denominators included the total number of hospitalized neonates in neonatal care units.

Results

In 2016, PPS included 489 neonates including 82% in general wards and 18% in neonatal intensive care unit (NICU). Overall antibiotic consumption rate in neonatal care units was 15% (95% CI 12-19%), 10% in general neonatal wards and 40% in NICU (p<0.0001). Overall common antibiotic prescriptions were ampicillin plus gentamicin (49%), vancomycin (16%) and meropenem (15%). The most common prescribed antibiotics in general neonatal wards were ampicillin plus gentamicin (68%) followed by cefotaxime (14%), while in NICU were ampicillin plus gentamicin (41%), vancomycin (29%) and meropenem (24%). The most common indications of antibiotic prescribing were sepsis/bacteremia (80%) followed by prophylaxis (6%). Hospital-acquired infections accounted for 24% of prescriptions.

Conclusions

Fifteen percent of inpatient neonates in KCMH received at least one antimicrobial agent which was compatible with global data but high consumption of meropenem and vancomycin were identified.
COMBATING ANTIMICROBIAL RESISTANCE AND ANTIMICROBIAL STEWARDSHIP

POINT PREVALENCE SURVEY AND ANTIMICROBIAL PRESCRIPTION PATTERNS IN A TERTIARY-CARE PEDIATRICS UNIT IN THE GARPEC NETWORK

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Background and aims

Global Antimicrobial Resistance, Prescribing, and Efficacy among Neonates and Children (GARPEC) network is aimed to survey antimicrobial consumptions in children globally. The study aims to describe rate and antimicrobial prescribing pattern in pediatric wards at King Chulalongkorn Memorial Hospital (KCMH), a single GARPEC site.

Methods

A one-day cross-sectional point prevalence survey on antimicrobial use was conducted monthly between January and June 2016 using standardized tools. All in-patient children receiving an antimicrobial treatment at 8:00 am on the day of survey were included in the analysis.

Results

The study included 644 children, 62% from general pediatrics, 15% surgery, 13% oncology and 10% intensive care unit. The overall antibiotics consumption was 43% (95% CI 39-47), of which 75% use single antibiotic and 25% use poly-antibiotics. Rate of antibiotic prescriptions and choice of antibiotics is shown in table 1. The most common reasons for antimicrobial use were sepsis, lower respiratory tract and skin/soft tissue infections. In surgery wards, 68% of antibiotic prescription was for surgical prophylaxis. The appropriateness of antibiotics use was evaluated according to hospital treatment guidelines, 70% of antimicrobial prescribing was appropriate.
Conclusions

About half of children hospitalized received antibiotics. Eventhough rate of antibiotics consumption is similar to other pediatric tertiary care centers, but up to one-fourth were meropenem. Antimicrobial stewardship program should be implemented.

Table 1 Antimicrobial prescriptions rate and choice of antibiotics in pediatric wards

<table>
<thead>
<tr>
<th>Type of pediatric wards</th>
<th>Antimicrobial prescription rate</th>
<th>Antibiotics rank #1</th>
<th>Antibiotics rank #2</th>
<th>Antibiotics rank #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Pediatrics (N=400)</td>
<td>149 (37%)</td>
<td>Meropenem (25%)</td>
<td>3rd cephalosporin (20%)</td>
<td>Antipseudomonas (13%)</td>
</tr>
<tr>
<td>Pediatric Oncology (N=83)</td>
<td>39 (47%)</td>
<td>Antipseudomonas (37%)</td>
<td>Meropenem (31%)</td>
<td>Vancomycin (17%)</td>
</tr>
<tr>
<td>Intensive Care Units (N=62)</td>
<td>24 (39%)</td>
<td>Meropenem (29%)</td>
<td>Antipseudomonas (14%)</td>
<td>Colistin (11%)</td>
</tr>
<tr>
<td>Surgery (N=99)</td>
<td>67 (68%)</td>
<td>3rd cephalosporin (41%)</td>
<td>Cefazolin (23%)</td>
<td>Metronidazole (15%)</td>
</tr>
</tbody>
</table>

*3rd generation cephalosporin include ceftriazone and Cefotaxime
Antipseudomonas antibiotics include ceftazidime and piperacillin/tazobactam
Background and aims

Carbapenem-resistant Enterobacteriaceae (CRE) is an emerging global infection threat. Few data on CRE infection in pediatric population are available. This study reviewed the clinical characteristics, antibiotic resistance, therapy and outcomes from a cohort of children infected with CRE in China.

Methods

We performed a retrospective, matched case-control study. Cases with CRE infection during January 2006 to December 2015 were individually matched to 2 children with carbapenem-susceptible Enterobacteriaceae (CSE) infection.

Results

32 children with CRE infection were indentified. Median age was 6.5 months (ranged from 30 minutes to 15 years). 53.1% of children had one or more underlying diseases, including preterm birth, congenital heart disease, digestive malformation and so on. 59.4% was hospital-acquired infection. Pneumonia, sepsis were the most common diseases. The following risk factors were identified for CRE infection by univariate analysis: previous exposure to β-lactam/β-lactamase inhibitors and carbapenem, admission in ICU, receiving mechanical ventilation and invasive procedures (all $P<0.05$). Totally, 36 CRE isolates were isolated. The most frequently isolated CREs were Enterobacter cloacae (41.7%) , followed by Klebsiella pneumoniae (19.4%) and Escherichia coli (13.9%). 97.2% of the CRE isolates were multidrug-resistant. Only 5.6% of isolates were resistant to amikacin. Seven tested isolates were all sensitive to tigecycline. Children with CRE infection had a longer length of stay and higher mortality than those with CSE infection (34 d vs.14 d, $P=0.009$, 21.8% vs.1.6%, $P=0.003$).

Conclusions

CRE infection mainly causes severe pneumonia and sepsis. There are few antibiotics choices and the mortality is pretty high.
Initial evidence from resource-limited countries using the WHO HIV drug resistance (HIVDR) threshold survey suggests that transmission of drug-resistance strains is likely to be limited. However, as access to ART is expanded, increased emergence of HIVDR is feared as a potential consequence. We have performed a surveillance survey of transmitted HIVDR among recently infected persons in the geographic setting of Accra, Ghana.

As part of a cross-sectional survey, 2 large voluntary counseling and testing centers in Accra enrolled 50 newly HIV-diagnosed, antiretroviral drug-naïve adults aged 18 to 25 years. Virus from plasma samples with >1,000 HIV RNA copies/mL (Roche Amplicor v1.5) were sequenced in the pol gene. Transmitted drug resistance-associated mutations (TDRM) were identified according to the WHO 2009 Surveillance DRM list, using Stanford CPR tool (v 5.0 beta).

Subtypes were predominantly D (39/70, 55.7%), A (29/70, 41.4%), and C (2/70; 2.9%). Seven nucleotide sequences harbored a major TDRM (3 NNRTI, 3 NRTI, and 1 PI- associated mutation); HIVDR point prevalence was 10.0% (95%CI 4.1% to 19.5%). The identified TDRM were D67G (1.3%), L210W (2.6%); G190A (1.3%); G190S (1.3%); K101E (1.3%), and N88D (1.3%) for PI.

In Accra, the capital city of Ghana, we found a rate of transmitted HIVDR, which, according to the WHO threshold survey method, falls into the moderate (5 to 15%) category. This is a considerable increase compared to the rate of <5% estimated in the 2006-7 survey among women attending an antenatal clinic in Mamobi. As ART programs expand throughout Africa,
A SURVEILLANCE OF CARBAPENEMASE-PRODUCING KLEBSIELLA PNEUMONIAE REVEALS INCREASED PREDOMINANCE OF NDM-1 AND EPIDEMIOLOGY OF CARBAPENEM-RESISTANT BLOODSTREAM INFECTIONS IN A CHINESE CHILDREN’S HOSPITAL

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Background and aims

To characterize CPM-non-susceptible K. pneumoniae and carbapenemase produced by these strains isolated from Beijing Children’s Hospital, we conducted this study to investigate the molecular epidemiology and clinical characteristics of BSIs due to CRKp at a tertiary pediatric hospital in China.

Methods

The Minimal Inhibition Concentration values for 15 antibiotics were assessed using the Phonix100 compact system. PCR amplification and DNA sequencing were used to detect genes encoding carbapenemases. Relationships were determined by performing multilocus sequence typing (MLST).

Results

179 strains of CPM-non-susceptible K. pneumoniae were isolated from 2010 to 2014. NDM-1 producing isolates increased from 7.1% to 63.0% in five years and IMP-4 producing isolates decreased from 75% to 28.3% (Table 1). During the study period, 52 (31.7%) were caused by CRKp strains. blaNDM-1, blaIMP-4, and blaKPC-2 were detected in 53.8%, 36.5%, and 7.7% of the isolates, respectively. The distribution of CRKp isolates between 2011 and 2014 is shown in Figure 1. The antimicrobial susceptibility profiles of the CRKp isolates are listed in Table 2. The baseline clinical characteristics of the study population are presented in Table 3. These 31 STs were further separated using eBURST software into one clonal complex (including ST11 and ST1326) and 29 singletons (Figure 2).

Conclusions

A high prevalence of CRKp isolates collected from blood cultures and the predominance of NDM-1-producing among children. The most predominant sequence type in our study was ST782; notably, ST14 was the most common NDM-1-positive clone. For patients who have risk factors, further surveillance and strict infection control measures are urgently needed to prevent the expanded spread of CRKp.
Trends in microbiological spectrum and antimicrobial susceptibility of bacterial isolates at a tertiary pediatric and maternal care center in Ulaanbataar, Mongolia

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Background and aims

Information on microbiological and susceptibility profiles of clinical bacterial isolates in Mongolia is scarce. In order to develop infection control and stewardship policies at Mongolia’s National Center for Maternity and Children’s Health, species and resistance profiles were analyzed over a four year period.

Methods

All samples submitted for culture from 01/2014 to 06/2017 were included, duplicates isolated within 30 days were excluded. Species identification and susceptibility testing, interpreted following Clinical and Laboratory Standards Institute guidance, patient demographics, specimen data and adequacy of the microbiological work-up were analyzed.

Results

Of 11,889 isolates, E. coli (27.7%), Enterobacter spp. (20.7%), S. aureus (21.2%), Candida (12.7%) and Coagulase-negative staphylococci (8.4%) accounted for 90% of organisms. Most enterobacteriaceae would have fulfilled criteria but did not undergo confirmatory testing for extended spectrum beta-lactamases (ESBL). Among Klebsiella spp., isolates exhibiting susceptibilities concerning for ESBL production increased from 73% to 95% during the study period; two-thirds were resistant to three or more antimicrobial classes. Multidrug resistance more than doubled among E. coli and Enterobacter spp. between 2016 and 2017 from 6% to 17% and 10% to 21%, respectively. Reduced carbapenem susceptibility was present in 12% of Enterobacter spp. and 19% of Klebsiella spp. isolates. Main sources of highly resistant enterobacteriaceae were intensive care wards.

Conclusions

Enterobacteriaceae exhibiting susceptibility patterns concerning for ESBL production and multidrug resistant organisms were common. This has informed strategies to strengthen microbiological diagnostic and surveillance systems, infection control measures emphasizing the intensive care environment, and antimicrobial stewardship at Mongolia’s largest children’s and maternity hospital.
Background and aims

It has been reported that approximately 23% of neonatal deaths are caused by infections worldwide. A detailed understanding of antibiotic treatment for neonatal infectious diseases is the first step to determine the scope of the problem. There is currently limited data on antibiotic use for neonatal infectious treatment in China. This study describes antibiotic prescribing patterns in hospitalised neonates in Chinese hospitals.

Methods

One-day cross-sectional Point Prevalence Surveys (PPSs) of antibiotic prescribing were conducted between February 2016 and February 2017. A web-based surveillance system was used for data collection across Chinese hospitals during the study period. The surveys included all neonates aged ≤ 30 days receiving at least one antibiotic for treatment on the day of PPS. Data collected included demographics, clinical data, antibiotics, dose, frequency, route of administration, and reasons for treatment.

Results

A total of 18 Chinese hospitals were participated in 4 PPS surveys, 722 neonates were included (male: 59.7%; 431/722). The mean gestation age was 36.2 weeks (SD 3.8). Amoxicillin and enzyme inhibitor accounted for 18.1% of all antibiotic prescriptions, followed by ceftizoxime (17.2%), and meropenem (13.9%) for neonatal infectious treatment (Figure 1). The common recorded reasons for antibiotic prescribing were lower respiratory tract infection (41.9%), sepsis (14.8%), and newborn prophylaxis for newborn risk factors (9.7%).
Conclusions

This survey demonstrates the feasibility of conducting antibiotic prescribing surveillance among hospitalised neonates through a web-based system in China. It needs to further assess the appropriate choice of antibiotics in this population.
A MULTICENTER STUDY ON ANTIBIOTIC-RESISTANCE PATTERNS OF HAEMOPHILUS INFLUENZAE ISOLATED FROM PEDIATRIC PATIENTS IN 2016, CHINA

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Background and aims

*Haemophilus influenzae* (*H. influenzae*) is a common pathogen of acute respiratory tract infections, otitis media and vulvovaginitis in children. In recent years, ampicillin-resistant *H. influenzae* increased yearly based on some single-center studies in China, as a result, study on susceptibility to more antibiotics in *H. influenza* stains based on multicenter is needed.

Methods

Specimens obtained from patients in 6 children’s hospital were inoculated on Haemophilus selective medium. Drug-sensitivities tests were performed with the disc diffusion method. Cefinase disc was used to detect β-lactamase.

Results

A total of 2073 *H. influenzae* strains, 83.6% from respiratory tract specimens and 16.3% from other specimens (11.1% from vaginal swab) were identified in 2016. The age of the children with respiratory tract strains were significantly younger than those with other originated strains (*P* < 0.01). Among all strains, 50.3% were β-lactamase positive, and 58.1% were resistant to ampicillin. The susceptibilities rates to sulfamethoxazole-trimethoprim, cefuroxime, azithromycin, ampicillin-sulbactam, amoxycillin-clavulanic acid, chloramphenicol, cefotaxime, meropenem and levofloxacin and were 36.4%, 63.5%, 68.0%, 82.3%, 83.7%, 89.5%, 93.9%, 99.1% and 99.6% respectively. Higher resistance to ampicillin, cefuroxime, azithromycin, and sulfamethoxazole-trimetoprim was found in respiratory tract strains, compared with other strains (*P* < 0.05).

Conclusions
The drug-resistance rates of *H. influenzae* isolated from respiratory tract specimens were higher than those from other specimens. Resistant rate of ampicillin in *H. influenzae* strains is high in China, and third-generation cephalosporins, such as cefotaxime, are effective antibiotics to treat *H. influenza* infected diseases.
Background and aims

The study evaluate the antibiotics’ influence on intestinal flora in premature infants.

Methods

33 preterm infants were divided into four groups according to when (within 1 week after birth) application of antibiotics and the types of antibiotics. Every infant stool was collected respectively. Application of 16srRNA technology to analysis the composition of fecal flora at different levels, the content of each flora, diversity of each group.

Results

The overall content and diversity of intestinal flora in premature infants was low. On the level of phylum, mainly proteobacteria and Firmicutes. Some groups which application of antibiotics, including Actinobacteria and tenericutes. The application of penicillin antibiotics had the least effect on intestinal flora. Application of two kinds of cephalosporins antibiotics had the greatest impact on intestinal flora. On the level of genus, compared with the untreated group, the number of Escherichia coli, Klebsiella and Clostridia decreased in the use of penicillin antibiotic group, the difference is statistically significant. Compared with the untreated group, the number of Escherichia coli and Klebsiella decreased, Clostridia increased in the use of cephalosporin or penicillin antibiotic group, the difference is statistically significant. Compared with the untreated group, the number of Clostridia decreased, Paenibacillus increased in the use of two kinds of cephalosporin antibiotic group, the difference is statistically significant.

Conclusions

In the abundance and diversity of bacteria, application of two kinds of cephalosporins antibiotics than control group and one cephalosporin antibiotics group was significantly reduced. After using antibiotics, the normal intestinal flora has been reduced (Escherichia coli, Klebsiella and Clostridia). Paenibacillus increased.
THE ANALYSIS OF ANTIBIOTIC USE IN BRONCHIOLITIS HOSPITALIZED CHILDREN IN YUYING CHILDREN’S HOSPITAL OF WENZHOU MEDICAL UNIVERSITY FROM 2006 TO 2015

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Background and aims

Children with bronchiolitis should not be given antibiotics to treat the infection because it is usually caused by a virus, such as the respiratory syncytial virus. However many bronchiolitis children were treated with antibiotics in our present world. This study aims to investigate the antibiotic use in bronchiolitis hospitalized children in Yuying Children’s Hospital of Wenzhou Medical University from 2006 to 2010 and from 2011 to 2015 and evaluate the rationality of their utility.

Methods

There were 456 and 572 cases randomly selected from a total of 2356 and 2959 bronchiolitis hospitalized children during the period from 2006 to 2010 and from 2011 to 2015 as the research object, respectively. The usage rate of antibiotics, combined medication and rational drug use conditions of different time were analyzed.

Results

From 2006 to 2010, 424 cases used antibiotics and the antibiotic prescription rate was 93.0%; while from 2011 to 2015, 338 cases used antibiotic and the antibiotic prescription rate was 59.1%. Antibiotic use rate decreased significantly compared with the two periods. Cephalothin was the mostly prescribed antibiotics in clinical use. The proportion of oral medication increased, and a combined usage of two antibiotics decreased.

Conclusion

The antibiotics were more rationally used for bronchiolitis children in-patients in our hospital in recent years than early tends, but it needs a further strengthen management and rational use of the clinical.
BACKGROUND AND AIMS

Antimicrobial stewardship is an important component of modern medical practice. Audit and surveillance of antibiotic use with feedback to prescribing clinicians is recommended as a high impact core stewardship intervention. The aim of this study was to assess and reduce unnecessary antimicrobial use in a neonatal unit.

METHODS

A prospective audit was performed to systematically assess compliance of antimicrobial prescribing with local antimicrobial guidelines in September 2016. Following this, educational interventions were applied to improve compliance with the guideline and electronic prescribing was introduced to the neonatal unit and re-audit was performed. The primary outcome was a reduction in days of antibiotic therapy per 1000 patient days.

RESULTS

There were 312 neonatal admissions throughout the study. There was a significant overall reduction in the primary outcome of DOT/1000 patient days from 572 to 417 DOT from September to March (p<0.0001). This represents a 27% reduction in total antibiotic use. Prolonged antibiotic treatment >36 hours in negative PSWU cases were reduced from 82 DOT to 7.5 DOT (p=0.0004). Similarly treatment courses >5 days for culture negative sepsis were reduced from 46.5 DOT to 7 DOT (P=0.0009).

CONCLUSIONS

Anti-microbial stewardship plays an important role in the neonatal unit in ensuring that the appropriate drug, dose, route and duration are employed to ensure adequate treatment while minimising the risks of unnecessary antibiotic use. Monitoring antibiotic prescribing data, as in this audit, can provide useful insights into the trends of antibiotic use and also inform clinicians of potential areas where antibiotic use may be safely reduced.
Background and aims

Bloodstream infections caused by multidrug-resistant Gram-negative bacteria represent a significant cause of morbidity and mortality in hospitalized children. Better understanding regarding the epidemiology and the development of antimicrobial resistance in these conditions is mandatory to guide appropriate empirical antimicrobial drug therapy. The goal of this study was to assess such parameters focusing on gram-negative bloodstream infections occurring in a Pediatrics Sector of a tertiary university hospital during a 4-years timespan.

Methods

The Santa Casa de São Paulo is a third level university hospital containing 129 beds dedicated to the Pediatrics Sector. A retrospective study of microbiological surveillance was conducted and all pediatric patients that exhibited gram-negative bloodstream infections in the period of January 2013 to December 2016 were included.

Results

Overall, 332 blood cultures in 320 patients were included, 281 (84.8%) were classified as healthcare-associated bloodstream infections. The median age of the patients was 7 months. Most frequently isolated strains were Klebsiella sp. (37.7%), Acinetobacter sp. (14.5%), Pseudomonas sp. (12.9%) and Escherichia coli (12%). The percentage of multidrug-resistant (MDR) organisms among isolated species was 41.3% and pandrug resistant (PDR) was 2.7%. The mortality rate within 30 days was 19.3%. The percentage of MDR organisms among isolated species from dead individuals was 46.7% and PDR was 8%.

Conclusions

The increasing incidence of antibiotic-resistant bacteria is of great concern. For this reason, multi drug treatment should be used as empirical treatment until definitive resistance profile is obtained, it is suggested that each hospital develops periodic assessments of the epidemiology of microbial infection and drug resistance like the one reported here.
Background and aims

Since the introduction of new guidelines by the National Institute for Health and Care Excellence (NICE) in August 2012, there have been changes in our management practice of newborns with suspected early onset sepsis (EOS). A major area of revision has been in investigations, where inflammatory markers are repeated after commencement of treatment and consideration for further investigations if there are raised inflammatory markers or no satisfactory clinical improvement.

The aim of our review was to compare our management practice with recommendations by NICE and by so doing, improve our antibiotic prescribing.

Methods

The study was a retrospective review of management of neonates with suspected sepsis admitted to the postnatal unit in Prince Charles Hospital, Merthyr Tydfil, during a 12 months period between 1st of January to 31st of December 2014.

Results

82 babies were started on antibiotics on labour ward, theatre rooms and PNW. 17(21%) were preterm infants born before 37 completed weeks of gestation. 79/82 (96%) had blood culture taken. There were 3/79(4%) positive blood cultures. Two of these (streptococcus sanguis and Acinetobacter iwoffii) were considered to be contaminants while one blood culture of Streptococcus agalactiae (GBS) was the only significant culture growth.

The median time to commencement of antibiotics was 3.7 hours, and median duration of therapy was 102.5 hours.

There were 29/82 babies with two CRP <1, and negative blood culture after 24 hours whose antibiotics could have been stopped after 36 hours.

Conclusions

The best antimicrobial stewardship would be to stop Intravenous antibiotics at 36 hours when there is clearly no evidence of infection.
SURGICAL ANTIBIOTIC PROPHYLAXIS IN CHILDREN: ADHERENCE TO GUIDELINES AND POST-OPERATIVE INFECTIONS - A COHORT STUDY

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Background and aims

Surgical antimicrobial prophylaxis (SAP) reduces post-operative infections, with appropriate prescribing being the cornerstone of antimicrobial stewardship. SAP guidelines exist, but little is known about their use, performance and practice in children.

We aimed to review adherence to SAP, assess risk factors for non-adherence and assess rate of early post-surgical infections.

Methods

We performed a retrospective cohort study of pediatric surgical cases (0 to < 18 years) at a tertiary children’s hospital (2016). Patient characteristics, surgical factors, and antibiotic details were evaluated against hospital guidelines for overall adherence and domains of: antibiotic choice, dose (within +/- 10%), re-dosing, timing and duration. Multiple regression analysis was used to determine risk factors for non-adherence. Hospital records were reviewed for post-operative infections at 7 and 30 days.

Results

Among 326 cases, overall guideline adherence was 39.6% but varied by domain and surgical subspecialty. Incorrect wound classification was associated with overall non-adherence on multivariate regression (OR: 2.795; p <0.001). Incorrect antibiotic choice was more likely with penicillin hypersensitivity (OR 138.34, p = 0.0004) and incorrect dosing more likely in adolescent patients (OR 6.41; p =0.003). Invasive devices were associated with prolonged duration of antibiotics (OR 2.92, p=0.016). Only 2 post-operative infections were documented by 30 days. Data were insufficient to exclude mild infections managed in the community.

Conclusions

SAP was suboptimal in children and with varying non-adherence across different domains, each representing areas for future improvement and interventions to optimise adherence. Documented infections were rare but enhanced follow-up was an identified gap.
Impact of Pneumococcal Immunization on Antibiotic Resistance - Results of the German Colonization-Surveillance Study

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Background: In 2006, German health authorities recommended universal pneumococcal conjugate vaccination for infants. Immunization started with PCV7, later substituted by PCV10 or PCV13. Epidemiological data show that PCV-serotypes often carry antibiotic resistance. Our multicenter prospective epidemiological trial investigated this important aspect of mucosal colonization.

Methods: Testing of nasopharyngeal pneumococcal isolates before the first dose of PCV (age 3-4 months, visit 1), after the third dose (age 9-12 months, V2), after completed primary series (age 17-19 months, V3), and at age five (V4) for antibiotic susceptibility against frequently used anti-infectives.

Results: We followed-up 154 of 242 initially included healthy subjects (65.3%) to the age of five years. In parallel with mucosal decolonization, a decrease of antibiotic-resistant pneumococci was observed, especially for macrolides (21% at V1, 11% at V4) and clindamycin (from 12% to 4%). For tetracyclines, which are more important in older age groups, a decrease from a maximum of 10.5% to 3% was found.

Discussion & Conclusion: Our surveillance-study shows a continuous decrease of resistance against important antibiotics, confirming effective decolonization also in clinical practice. This supports the concept of herd protection from invasive pneumococcal diseases. In times of globally increasing antibiotic resistance, a positive „side effect“ of PCV-immunization is a subsequent decrease of antibiotic resistant-pneumococci.
Paratyphoid fever caused by *Salmonella* Paratyphi can lead to severe morbidity if treatment is delayed. However, empirical treatment is often based on susceptibility data of *Salmonella* Typhi. With rising reports of decreased ciprofloxacin susceptibility (DCS) and multidrug resistance (MDR; resistance to ampicillin, chloramphenicol and cotrimoxazole) of *Salmonella* Typhi, newer antibiotics are frequently prescribed. Little is known about antimicrobial susceptibility of *Salmonella* Paratyphi. We investigated susceptibility patterns of *Salmonella* Paratyphi-A isolates in Bangladesh and the respective gene mutations.

Between 1999 and 2016, 647 *Salmonella* Paratyphi-A strains were isolated from blood of suspected patients. Identification was confirmed by agglutination with specific antisera. Antibiotic susceptibility was determined using CLSI guidelines. GyrA-83, 87, gyrB-464, parC-57, 80 and parE-420 mutations were identified by PCR-RFLP.

No resistance was observed against chloramphenicol, cotrimoxazole and ceftriaxone. No MDR strain was detected; 0.7% (5/176) were resistant to ampicillin. DCS was observed in 97% (628/647) isolates (MIC50=0.5μg/mL, MIC90=1μg/mL). Overall, 97% (628/647) strains had gyrA-83/87 mutations; 90% (585/647) and 86% (556/647) had gyrB-464 and parC-57 mutations. No strain had parE-420 mutation. Average ciprofloxacin MIC of strains with gyrA-83/87 and parC-57 mutations was 1.5μg/mL (median MIC 0.75 μg/mL).

This is the first comprehensive study demonstrating antimicrobial susceptibility of *Salmonella* Paratyphi-A in the region. Prevalence of DCS in our strains is verified by DNA-gyrase and topoisomerase mutations. Absence of MDR implies that paratyphoid can be treated with first generation antibiotics in Bangladesh and should not be grouped with typhoid. This could reduce use of newer antibiotics and curb the emergence of newer resistance.
Background and aims

Background

Enteric fever is a major public health problem in tropical countries including India. Distribution of paratyphoid fever is 0.25 illnesses for every typhoid fever. There have been reports of changing antibiogram and age wise incidence.

Aims

To analyze the antibiotic sensitivity pattern and changing trends in antibiotic resistance of culture positive paratyphoid fever.

Methods

It is a retrospective study of case records of all children (196 cases) in the age group of 0-18 years diagnosed with culture proven paratyphoid fever, at Manipal hospital, Bangalore, India, between November 2008 to June 2016.

Blood culture was done by BacT/Alert 3D system Susceptibility to antimicrobial drugs was tested by the disc diffusion according to Kirby Bauer method.

Results

Of 826 cases of culture positive enteric fever, 630 were S. enterica serovar Typhi (76.2%) and 196 were Paratyphi A strains (23.7%).

8 % of the paratyphoid cases were below 2 years of age.

All strains were susceptible to third generation cephalosporins and azithromycin. Susceptibility to ampicillin (99.5%), chloramphenicol (100%) and cotrimoxazole (100%) is resurging. Resistance to nalidixic acid (96.43%) has been increasing.

Conclusions

S. paratyphi continues to remain susceptible to third generation cephalosporins. Resurgence of susceptibility to first generation antibiotics is noteworthy. Local antibiograms improve patient care, and reduce the treatment cost in developing countries, improving the compliance.
In view of high prevalence of paratyphoid fever in children, it may be advisable to strengthen vaccination at an early age and develop a bivalent vaccine to cover paratyphoid.
COMBATING ANTIMICROBIAL RESISTANCE AND ANTIMICROBIAL STEWARDSHIP

THE RELATIONSHIP BETWEEN ANTIBIOTIC RESISTANCE AND THE VIRULENCE GENES CAGA AND VACA OF HELICOBACTER PYLORI CLINICAL ISOLATES

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Background and aims

To evaluate the expression of virulence genes cagA and vacA of Helicobacter pylori clinical isolates and the prevalence of drug resistance in children in Guiyang, and to investigate whether there was any relationship between genotype and drug resistance in the Guiyang area.

Methods

Thirty-one Helicobacter pylori isolates were obtained from patients who underwent endoscopy in our unit. Polymerase chain reaction assays were used for the determination of virulence factors. Antimicrobial susceptibility was tested by Agar dilution method.

Results

The positive rate of cagA was 83.87%. Of the 31 specimens, 83.87%, 0%, 19.35%, 12.90% and 74.19% carried vacAs1a, vacAs1b, vacAs1c, vacAm1, and vacAm2, respectively. The resistance rates to amoxicillin, clarithromycin, and metronidazole were 16.13% (5/31), 19.35% (6/31) and 41.94% (13/31) respectively. No multiple resistant strain was found. Correlation was observed between resistant strains in clarithromycin and vacAs1a-positive strains (P=0.018), vacAm1-positive strains (P=0.029), and vacAm2-positive strains (P=0.035). Correlation was observed between metronidazole-resistant strains and vacAs1c-positive, cagA-positive (P=0.001) and vacAm2-positive strains (P=0.031).

Conclusions

In our area, the dominant genotype was cagA and vacAs1m2-positive. Resistance to clarithromycin is more frequently associated with s1a, m1 and m2 vacA mosaics and with cagA-positivity.
ANTIMICROBIAL AND ANTI-INFLAMMATORY FLAVONOIDS FROM ONOSMAHOOKERI C. B. CLARKE
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Background and aims

Onosmahookeri C. B. Clarke (hereafter referred to as O. hookeri), a perennial herb from the Boraginaceae family, is mainly distributed in the high altitude area of Tibet province of China, Bhutan, India, Nepal. The radix of this plant is an important traditional herbal medicine and has been widely used for the treatment of lung disorders and tuberculosis. However, the active ingredients of O. hookeri have not been explored.

Methods

Here we prepared total flavonoids (TFL) from O. hookeri and evaluated its antimicrobial and anti-inflammatory activities. TFL was found to possess significant antimicrobial and anti-inflammatory activity. Thus, TFL was submitted to a bioassay-guided purification. Structures of isolated compounds were identified by spectroscopic analysis.

Results

Two flavonoids, hydroxyethylrutin and taxifolin, were isolated from O. hookeri for the first time. The two compounds showed significantly inhibitory activity against gram positive, gram negative bacteria, fungi and LPS-activated NO production in RAW 264.7 cells.

Conclusions

These results indicated that TFL as well as the two isolated flavonoids could be considered as a potential source of functional food and pharmaceutical for reducing the risk of diseases associated with bacteria, fungi and inflammation.
ANTIMICROBIAL CONTROL IN OUTPATIENT DEPARTMENT OF A MATERNAL AND CHILD HEALTHCARE HOSPITAL

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Background and aims

Our hospital has launched a compulsory program on reducing the intravenous infusion and irrational use of antibiotic and antivirals in outpatient department. Hospital administration department announced and delivered extensively the regulation of antimicrobial control program to publics and clinicians.

Methods

We identified which diagnosis were mostly overprescribed or misprescribed with antibiotics and antivirals in outpatient department, discovered the barriers that lead clinicians to deviation from best practice, educated and conciliated with target clinicians to conquered related barriers; audited and reviewed prescriptions monthly, feedback and bulletin the clinicians who often overprescribed or misprescribed antimicrobials; furthermore enhanced advertisement of the risk of abuse of antimicrobials in public through WeChat Subscription of our hospital.

Results

We found that antibiotic and antivirals in outpatient department were mostly misprescribed to treat upper respiratory diseases and bronchitis, such as oral antibiotics cefixime, cefprozi, amoxicillin-clav, intravenous antibiotics ceftriaxone and cefoxitin. Acyclovir were usually misprescribed for respiratory infection. We invited famous infection control experts from Taiwan to educate the clinicians monthly on the treatment of specific respiratory infection. Clinic pharmacists educated clinicians acyclovir is rationally confined to treat HSV, VZV infection seasonally. After 18 months continuous regulation and propagation, the intravenous injection rate decreased from 10.4% to 2.27% in the first half of the year; the rate of antibiotic use decreased from 30.86% to 9.77%; the antibiotic use rate of pediatric department decreased from 30.2% to 25.4%;

Conclusions

The prescription of acyclovir was decreased from over 5000 times in May 2016 to 1117 times in May 2017.
ANALYSIS OF EFFECT FACTORS IN FASTIDIOUS BACTERIA ISOLATION OF LOWER RESPIRATORY TRACT SPECIMENS

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Background and aims

To investigate the effect factors in fastidious bacteria (Streptococcus pneumoniae and Haemophilus influenzae) isolation of lower respiratory tract specimens.

Methods

210 lower respiratory tract specimens from children were enrolled and the factors of deliver time, transport medium, and inoculation medium which effect on separation of fastidious bacteria were studied.

Results

The results of 210 specimens showed that the isolation of Streptococcus pneumoniae and Haemophilus influenzae significantly decreased with the increasing of acquisition time (P<0.05), but no significant difference were observed in the period of 0.5h, 2h, and 6h. The isolation of fastidious bacteria in semi-solid medium were higher than the other two transport medium with no statistical significance(P>0.05). No significant difference were detected in the isolation and the growth of Streptococcus pneumoniae and Haemophilus influenza (P>0.05).

Conclusions

The appropriated of deliver time, transport medium, and inoculation medium have some guidance significance for improving the isolation of fastidious bacteria.
GENETIC DIVERSITY AND ADAPTIVE EVOLUTION OF MULTIDRUG-RESISTANT STREPTOCOCCUS PNEUMONIAE ISOLATES
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Background and aims

Pneumococcal infections threaten the health of children throughout the world, and antimicrobial resistance in Streptococcus pneumoniae has become a serious problem.

Methods

We investigated genetic diversity and adaptive evolution in antibiotic-resistant S.pneumoniae isolates, by randomly selecting 25 pneumococcal strains isolated from children in Shanghai Children’s Hospital and determining their different antimicrobial resistance profiles.

Results

The results revealed that the genome size of the isolates was approximately 2.1 Mbp, covering >90% of the total estimated size of the reference genome. The overall G+C% content was approximately 39.5%, and 2200–2400 open reading frames were present. All the isolates with different drug resistance profiles harbored many indels (range, 131–171) and SNPs (range, 16 103–28 128). Genetic diversity analysis showed that the variation of different genes were associated with specific antibiotic resistance. Known antibiotic resistance genes (pbps, murMN, ciaH, rplD, sulA, and dpr) were identified, and new genes (regR, argH, trkH and PTS-EII) closely related with antibiotic resistance were found, although these genes were primarily annotated with functions in virulence, carbohydrate transport and metabolism, and amino acid transport and metabolism. Phylogenetic analysis unambiguously indicated that isolates with different antibiotic resistance profiles harbored similar genetic backgrounds. One isolate, 14-LC.ER1025, showed a much weaker phylogenetic relationship with the other isolates, possibly caused by genomic variation.

Conclusions

Further investigation of the genetic variation in the clinical isolates is needed to determine whether it is necessarily related to drug resistance.
ANTIMICROBIAL RESISTANCE AND GENOTYPES OF HAEMOPHILUS INFLUENZAE ISOLATES FROM RESPIRATORY TRACT IN CHILDREN

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Background and aims

To investigate the resistance and ftsI genotypes of Haemophilus influenzae isolates from respiratory tract in children.

Methods

141 consecutive non-repeat clinical strains of Haemophilus influenzae were collected from January to March 2016. Antimicrobial susceptibility was determined by K-B method. Beta-lactamase production was detected by Nitrocefin disk test. PCR technique was employed for ftsI genotyping. Antimicrobial resistance was compared between different ftsI genotypes.

Results

The prevalence of β-lactamases was 40.4%(57/141) in Haemophilus influenzae. The resistance rate to ampicillin was 53.2%. FtsI gene mutation was positive in 72.3%(102/141) of the isolates. The dominant genotype of genomic beta-lactamase-negative ampicillin-resistant (gBLNAR) was type III(72/102). Ampicillin and cefuroxime resistance rate of (gBLNAR) were higher than the genomic beta-lactamase-negative ampicillin-susceptible(gBLNAS) (P<0.05).

Conclusions

High prevalence of ftsI gene mutation, the dominant genotype of genomic beta-lactamase-negative ampicillin-resistant (gBLNAR) was type III. FtsI gene mutation in Haemophilus influenzae increased the resistance rate of ampicillin and cefuroxime.
Background and aims
To analysis the antimicrobial resistance profile in children.

Methods
10 tertiary children hospitals were involved in the ISPED program. Antimicrobial susceptibility testing were carried out according to a unified protocol using automated systems complemented with E-test and disk diffusion methods. Results were analyzed according to CLSI 2016.

Results
A total number of 56241 isolates, of which 41.5% gram positive organisms and 58.5% gram negative organisms were collected from January to December 2016. The percentage of the predominant organisms were 14.2% for *Escherichia coli*, 11.5% for *Staphylococcus aureus*, 11.1% for *Streptococcus pneumonia*, 9.2% for *Haemophilus influenza* and 7.6% for *Klebsiella pneumonia* respectively. The resistant rates of *Klebsiella pneumonia* to meropenem in neonatal and non neonatal groups were 27.4% and 15.4%, The resistant rates of *Pseudomonas aeruginosa* and *Acinetobacter baumannia* to meropenem in these two groups were 19.6% and 13.7%, 49.6% and 53.4% respectively. The MRSA rates of these two group were 46.2% and 33.3%. The penicillin non susceptible rates of *Streptococcus pneumonia* in these two groups were 6.6%, 18.2% respectively. The β-lactamase positive rates of *Haemophilus pneumonia* in these two groups were 48.6%, 65.2% respectively.

Conclusions
This investigation highlighting the worrisome situation of antimicrobial resistance in children in China.
SHORTENED POST-OPERATIVE ANTIBIOTIC REGIMEN IS SAFE IN CHILDREN AFTER LAPAROSCOPIC APPENDECTOMY FOR PERFORATED APPENDICITIS: A RETROSPECTIVE COMPARATIVE ANALYSIS

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Background and aims

Treatment of perforated appendicitis is a major concern in the children population. In the past 10 years, most pediatric surgeons preferred a 1-2-week post-operative antibiotic regimen in China. We reviewed our data in the past 28 months to testify the safety of shortened post-operative antibiotic management.

Methods

We conducted a retrospective comparative analysis of all the children who got admitted in Dalian children hospital, China with diagnosis of perforated appendicitis both pre-operative and post-operative. The patients were separated into 2 groups, that is 5 days group and 7 days group. They all received intravenous (I.V) antibiotic treatment of cefoperazone/cefathiamide and ornidazole post-surgery. Discharge criteria was normal WBC, able to tolerate feeds orally, afebrile for more than 24hrs and stable clinically. The patients in day 5 group were those who got discharged home after a complete 5 days of IV antibiotics post-surgery. The group of 7 days were those who had at least 7 days of intravenous antibiotic treatment according to the old protocol we use. Outcome was compared based on hematological indices and inflammatory biomarker, complications after surgery, hospital cost etc.

Results

Of all 62 patients eligible for the study, there was no record of re-hospitalization for surgical related complication with mean follow up of 3 months in both groups (abscess formation or wound infection) in both groups. There was significant difference in terms of health care expenses between the two groups.

Conclusions

Its safe to discharge children who meet discharge criteria with normal count of WBC in day five of I.V antibiotics.
Background and aims

To investigate the pattern of antibiotic use in the emergency department of a pediatric institution and the correlation between antibiotic usage, inflammation markers, and indication.

Methods

To analyze the indication of antibiotics used and the distribution of antibiotic spectrum in all 24-hour emergency antibiotic prescriptions. We collected general patient information including demographics, diagnosis, peripheral white blood cells (WBC) and high sensitive C Reactive Protein (hsCRP), as well as detail information of the antibiotics including name and administration.

Results

On December 10, 2016, a total of 656 emergency cases were enrolled. The overall antibiotic usage was 32.5%. The percentage of people used a single type of antibiotics was 94.4%, versus the percentage of two types of antibiotics was 5.6%. For the method of administration of the antibiotics: intravenous administration was 40.8%, and oral administration was 59.2%. The top three intravenous antibiotics classes used were: second-generation cephalosporins, macrolides, penicillins. The top three oral antibiotic classes were: macrolides, third-generation cephalosporins, second-generation cephalosporins. The number of cases who had been treated with antibiotics and have examined WBC and hsCRP was 132, of which 63.6% had increased WBC, 39.4% had increased hsCRP, and 27.3% with WBC and hsCRP elevated. The main indications for antibiotic use were: acute bronchitis, acute upper respiratory tract infection, acute bronchial pneumonia, acute asthmatic bronchitis, acute gastrointestinal infections.

Conclusions

The main indication for antibiotic use in emergency children was mainly related to respiratory tract infection. The two leading antibiotics used in emergency children were cephalosporins and macrolides.
ANTIBIOTIC USAGE IN CHINESE CHILDREN, DATA FROM NATIONAL ANTIBIOTIC POINT PREVALENCE SURVEY

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Background and aims

Now the antimicrobial resistance is the big threat all over the world, there is close relation between antibiotic therapy and resistance. Many researches on antibiotic resistance have been done but few studies giving the data of antibiotic prescription in Chinese children. In this study, we will report data of antimicrobial therapy in children and neonates admitted in 18 children's hospital and pediatric health centers.

Methods

Data on antimicrobials prescribed to all hospitalized patients under 18 years of age at participating centers within a 24 hour period was collected in China between December 2016 to February 2017. 18 children's hospitals and pediatric centers in 9 provinces joined this survey.

Results

The survey was done in 35 wards including surgery, special medical ward, neonatal intensive care unit, pediatric intensive care unit, general pediatric ward in 12 cities from 9 provinces. 1135 patients joined in this investigation and 808(71.9%) were given at least one antibiotic in the PPS day. Antibiotics combination therapies in 25.2%. Just 0.98% of patients were prescribed antibiotic for prophylaxis and 99.02% for treatment of infectious disease. The commonest three reason for giving antibiotic were proven or probable bacterial LRTI(66.28%), Upper respiratory infections(6.65%), and Central nervous system infections(4.89%). The top 3 antibiotics were The third generation of cephalosporins(35.19%), macrolides(22.97%) and penicillins plus inhibitors(15.74%)

Conclusions

This survey provided the baseline data of antibiotic prescribing in Chinese children. LRTI was the commonest indication of antibiotic prescriptions. Overuse of third generation of Cephalosporins were found in children.
RESPIRATORY WARDS ANTIBIOTIC PRESCRIBING IN ONE WINTER DAY: POINT PREVALENCE SURVEYS IN CHINESE CHILDREN
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Background and aims

Antibiotic overuse in children remains common and more than 70% antibiotics was used for respiratory infection disease. The aim of this study was to analyse antibiotic prescribing in hospitalized children of respiratory wards in China.

Methods

The GARPEC project facilitates global standardized surveillance for antibiotic use in children and neonates. Through GARPEC, one Point Prevalence Surveys (PPSs) of antibiotic prescribing was conducted in China in December one day in 2016. Demographic and clinical data were collected.

Results

A total of 11 respiratory wards of Chinese hospitals were participated, including 393 children. These children received 27 kinds antibiotic in that winter day. The overall rate of antibiotics was 81.29% and 28.24% patients was given at least two antibiotics at the same time. The most commonly prescribed antibiotics were azithromycin, amoxicillin-clavulanic acid, and ceftriaxone among hospitalised children in respiratory wards. There were 6 hospitals in the northern region of China and 5 hospitals in the southern region in this PPS and the antibiotic rates between regions were significant difference (87.36% vs 75.00%, \(\chi^2=13.28, p<0.01\), respectively in northern region and southern region). However, the rates of combination usage were same (28.24% and 24.74%, \(\chi^2=2.65, p>0.05\)). Beta-lactam antibacterials and macrolides were most combined used.

Conclusions

This study has showed the rate of antibiotic use was relatively higher, especially in the northern region in China. And the further study should be focused on the rationale use of antibiotics in children.
A CLINICAL ANALYSIS OF MICAFUNGIN TREATMENT IN PULMONARY INVASIVE FUNGAL INFECTION IN PEDIATRIC PATIENTS WITH HEMATOLOGICAL MALIGNANCIES OR POST HEMATOPOIETIC STEM CELLS TRANSPLANTATION

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Background and aims

To investigate the clinical effects and safety of micafungin(MCM) for pulmonary invasive fungal disease(PIFD) in pediatric patients with hematological malignancies or post hematopoietic stem cells transplantation.

Methods

25 PIFD children with malignant hematological disease or post hematopoietic stem cells transplantation were selected to analyze the therapeutic effect and adverse effect. Among those children, 12 cases with acute Leukemia (AL) after chemotherapy, 4 cases with acute leukemia (AL) after allogeneic hematopoietic stem cell transplantation (allo-HSCT), 9 cases were β-thalassemia major after allo-HSCT. All the children received treatment of MCM for PIFD. A dose of MCM 3-4mg.kg.d⁻¹ was administered for once-daily. 7 days a cause of treatment, and the children received 2 to 6 courses individually. 1,3-β-D glucan assay(G test), high-resolution CT and the biochemical indexes for organs functions were kept on watch.

Results

In this group, 13 cases were cured, 4 cases turned better, 4 cases improved clinically and 3 cases were invalid, the total effective rate was 68%, the effective rate of MCM monotherapy group was 66.7%, the effective rate of MCM combining therapy group was 69.2%. No side-effects were found in those children with MCM treatment.

Conclusions

Micafungin is effective and safe in the treatment of pulmonary invasive fungal disease in pediatric patients with hematological malignancies or post hematopoietic stem cells transplantation.
ECONOMIC BURDEN OF FEVER AND GENDER DISPARITIES IN HEALTHCARE EXPENDITURE FOR TREATMENT OF FEVER AMONG CHILDREN IN INDIA

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Background and aims

Fever is an important public health challenge for India, particularly among young children. A large number of deaths due to fever among children. Objective of this study to examine economic burden healthcare expenditure (HCE) due to fever and gender disparity in HCE for treatment of fever among children (0-14 Age).

Methods

This study based on recent 71st round of nationally representative survey NSSO data (2014). Descriptive statistics and bivariate analysis used to estimate average HCE and Oaxaca decomposition used to find out determinants of gender disparity in HCE for fever.

Results

Result shows that 18% patient used healthcare facility for fever treatment among children in India. Average treatment cost of fever is INR 8610 for inpatient and INR 604 is for Outpatient care. Girls reported less use of healthcare facility for fever treatment, particularly inpatient care. Further average HCE is much lesser for girls compared to boys. Gender difference is much higher for inpatient care. Oaxaca Decomposition result suggests that education oh household head and economic status of household contributing more to widening the gap in HCE for boys and girls.

Conclusions

Economic burden of fever treatment is much higher in India. India has highest Out of Pocket health expenditure and low public spending on health. Large part of HCE is made by household, which leads inequality in HCE within family. In India due to social hierarchy and deep-rooted patriarchal structure parents are less prefer to girls to provide healthcare facility. Indians spend less on female healthcare than on male healthcare.
DENGUE FEVER

DENGUE FEVER IN CHILDREN ADMITTED FOR VIRAL HAEMORRHAGIC FEVER IN IBADAN, NIGERIA

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BACKGROUND AND AIM
Dengue fever is a mosquito borne viral hemorrhagic fever (VHF) known to be highly prevalent in tropical Asia but has been reported to have an increasing global incidence. The incidence and impact of Dengue in Nigeria is under-reported due to poor surveillance. Hence this case series is aimed at describing the cases of Dengue fever seen at the University College Hospital Ibadan.

METHODOLOGY
This was a case series of children admitted to Paediatric emergency ward over a 7-month period (April -October 2016). Diagnosis of Dengue was confirmed by Polymerase Chain Reaction test. Information collected included socio-demographic characteristics, clinical and laboratory parameters as well as outcome.

RESULTS
A total of 8 children were studied. The median age was 36 months (range 3- 60 months). There were 3 (37.5%) males and 5 (62.6%) females with 87.5% from low socio-economic class. Mean length of hospital stay was 6 days. Warning signs were identified in 6 (75%) patients, the most common being persistent vomiting and rapid breathing. Six (75%) had severe Dengue and severe malaria was a co-morbidity in 50% of cases. The mortality rate was 25% and all occurred within 48 hours of admission.

CONCLUSION
This case series demonstrates that Dengue fever is an important differential of VHF in Nigerian children. A high index of suspicion is required for diagnosis as most of the cases had non-specific symptoms. Early diagnosis and institution of supportive care is crucial for survival.
PREVALENCE OF DENGUE INFECTION AT A TERTIARY CARE HOSPITAL OF PUNE, WESTERN INDIA

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Background

Outbreaks of dengue fever / dengue haemorrhagic fever are being reported from countries in South-East Asia and India. We report a retrospective analysis of the suspected dengue cases tested in a tertiary care hospital, Pune.

Aim

To study the Prevalance of Dengue in the adult and paediatric patients of Bharati Hospital, Pune

This is a Retrospective study from 2011-2014. Serum samples from suspected cases were screened for NS1 antigen, IgM and IgG antibodies using Rapid solid Immunochromatography test.

Results

Out of suspected patients screened, 1169 were tested Positive. Of Positive cases 844 were adults and 325 were paediatric patients. 104 samples tested Positive for both IgM and IgG denoting Secondary Infection. Primary infection was reported in 809 cases. Of these cases, 754 were Positive for NS1 antigen and 55 were Positive for IgM antibody. Rest were either positive for IgG or for NS1, IgM and IgG together.

Conclusions

There was increased occurrence of Dengue infection during Monsoon and Winter season. Studies need to be done to identify circulating serotypes of dengue virus to design proactive strategies.
GREEN SYNTHESIZED SILVER NANOPARTICLES USING ZEUXINE GRACILIS AGAINST DENGUE VECTOR, AEDES AEGYPTI

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Background and aims

Mosquitoes are the most critical group of insects in the context of public health, since they transmit key parasites and pathogens, causing millions of deaths annually. Insecticides of from natural products may help the effectiveness of vector control programs. The utilization of various plant resources for the biosynthesis of metallic nanoparticles is called green nanotechnology. The present study reports the plant mediated synthesis of silver nanoparticles using the leaf extract of Zeuxine gracilis, which acts as a reducing and capping agent. The aim of the present study was to assess bio-synthesized AgNPs against dengue vector, Aedes aegypti.

Methods

The obtained nanoparticles were characterized using UV-visible spectroscopy; EDX (energy-dispersive X-ray), SEM (Scanning electron microscope), transmission electron microscopy (TEM), XRD (X-ray diffraction), Fourier transform infrared (FTIR), and dynamic light scattering (DLS) analysis. The efficacy of green synthesized AgNPs at different concentrations (50, 100, 150 and 200µg/ml) were tested on A. aegypti.

Results

The synthesis of AgNP was confirmed analyzing the excitation of surface Plasmon resonance using ultraviolet–visible (UV–vis) spectrophotometry. SEM, TEM showed the irregular shapes of AgNPs. The presence of silver was determined by EDX. FTIR spectroscopy, XRD and DLS analysis were carried out. The maximum efficacy was observed in synthesized AgNPs against dengue vector, respectively.

Conclusions

This method is considered as a new approach to control dengue vector. Therefore, this study suggests that the Z. gracilis- synthesized AgNPs can be a rapid, environmentally safer bio-pesticide to be used vector control programmes.
The clinical manifestations of dengue infections during early childhood are different opposed to older children. We have conducted this study in order to show the clinical aspects in early childhood and compared with older children.

This study was conducted in the Department of Pediatrics, Faculty of Medicine, Chulalongkorn University from 1987-2007. The study was done in all hospitalized pediatric dengue patients from aged 0-15 years. Comparison was done in all parameters between aged 0-2 years and 2-15 years.

Of 2,221 children aged 0-15 years diagnosed with dengue, 179 were children aged 0-2 years. Compared with 2,042 comparative subjects, the study group presented significantly more frequently with hepatomegaly, drowsiness, diarrhea, rash, convulsions, splenomegaly and unusual manifestations. The mean value of Hct (max) was 40.93%. The mean value of WBC (min) was 8,627 cells/mm\(^3\), and the mean of maximal percentage of lymphocytes, atypical lymphocytes and PMN were 55.42%, 10.29% and 30.94%, respectively. The mean minimal value of the platelet count was 62,473 cells/mm\(^3\). DF was more common in the study group and DHF was less common. The mortality rate of the study group at 1.67% was significantly higher than the comparative. Approximately 65% of study subjects were serologically proven to have primary infection while only 9.8% of older children have primary infection.

Dengue during early childhood is not uncommon and most of them acquire primary infection. Clinical manifestations show the different in some aspects. The essential recognition is to diagnose correctly and find the specific prevention in each group.

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Dengue during early childhood is not uncommon and most of them acquire primary infection. Clinical manifestations show the different in some aspects. The essential recognition is to diagnose correctly and find the specific prevention in each group.
CLINICAL CHARACTERISTICS OF HOSPITALIZED PATIENTS WITH DENGUE FEVER IN CHILDREN IN GUANGZHOU DURING AN EPIDEMIC OF 2014
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Background and aims
To explore the clinical characteristics of children hospitalized patients with dengue fever (DF) in Guangzhou in 2014, and raise the level of clinical physicians understanding of dengue fever in children.

Methods
Clinical data of 78 children hospitalized patients with DF admitted to our hospital in Guangzhou were retrospectively analyzed.

Results
The 78 cases of aged 27 d ~ 14 years old, average 5.64 years old. Epidemic areas have gathered trend, mainly concentrated in Baiyun, Haizhu and Yuexiu district. Major clinical manifestations are fever (100%), rash (82.05%) and myalgia/fatigue (28.21%). The main signs of lymph node enlargement (19.23%), liver (10.26%), spleen big rare (3.85%). Laboratory tests suggest leukopenia (80.77%) and thrombocytopenia (82.05%), ALT elevations (30.77%), AST rise 42.31%, blood coagulation function APTT prolonged obviously, accounted for 57.69%. Etiology examinations showed 66 cases of children with dengue virus nucleic acid detection, the positive rate 89.19%, found in the course of 1~10d, an average of 4.45d; 48 cases IgM positive, the positive rate of 81.36% of children with dengue virus, began to appear positive in the earliest time for the course of the first d, average 5.35d. Classification of the viral nucleic acid showed that the popular mainly for dengue virus type I. Clinical classification are typical dengue fever.

Conclusions
In 2014 guangzhou epidemic of dengue fever in children for dengue virus I type. With fever, rash, white blood cells and thrombocytopenia, clotting disorders, liver function damage as the main clinical features, such as not present typical dengue hemorrhagic fever and dengue shock syndrome, the prognosis is good.
Etiology of non-rotavirus-associated gastroenteritis pathogen among hospitalized children under five years of age in the Philippines, 2015

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Background and aims

Diarrheal disease continues to be a global health problem, particularly among young children in developing countries. In the Philippines, rotavirus infection remains to be one of the leading causes of child morbidity and mortality. In 2015, nearly forty percent of confirmed rotavirus cases were identified from the National Rotavirus Surveillance. To estimate the burden of disease caused by non-rotavirus-associated gastroenteritis in hospitalized children in the Philippines, confirmed rotavirus negative and positive stool specimens were tested for norovirus, adenovirus, sapovirus and astrovirus.

Methods

Randomly selected negative and positive samples for rotavirus collected in 2015 were included in the study. Stool specimens were tested for the presence of norovirus, adenovirus types 40 and 41, astrovirus and sapovirus by real-time polymerase chain reaction (qPCR).

Results

Enteric pathogens were detected in 52.5% (196/373) of the samples. A single pathogen was observed in 122 (32.71%) specimens and mixed infection showed in 74 (19.83%) specimens. In terms of frequency, 295 enteric pathogens were isolated from the 196 positive stool specimens. Adenovirus were the most common enteric pathogens identified in 66 (17.69%). The prevalence rates of norovirus, astrovirus and sapovirus were all at about 8%.

Conclusions

This data showed that in the Philippines, viral enteric viruses are the most cause of acute gastroenteritis in children less than 5 years of age. Such finding implies that continued monitoring in the epidemiology of enteric viruses is essential in planning the diarrheal disease control strategies, develop a more effective vaccine and assist policy makers in decision making on future vaccine implementation.
Background and aims

Background: worldwide, diarrhea is the second leading cause of childhood mortality, accounting for 1.34 millions deaths per year among children under five years of age. Rotavirus is the leading cause of severe diarrhea in young children and is responsible for approximately one-third of all diarrheal deaths. However, the incidence of norovirus infection in Cameroon and many other African countries is not known, recently rotavirus vaccine have been implemented within national childhood immunization programs in Cameroon.

Aim: To determine the period prevalence of NoV(norovirus) and identify different genogroup at the Chantal Biya Foundation (Yaoundé) in children presenting gastroenteritis and aged below five years.

Methods

During January 2014, 94 samples were tested for norovirus using enzyme-linked immnosorbent assay, and further genogrouped by one step RT-PCR as described by Kojima et al and modify by Chuan jay et al.

Results

Twenty (21.27%) of the 94 diarrhoeic stool samples tested for norovirus by ELISA were positive. Genogroup (G) distribution was 10% for GI, 30% for GII, 10% for both Of GI/GII. We obtained 50% of unspecific bands after the electrophoretic migration. A potential explanation can be the fact that the primers (used to target the ORF of the C region of the virus) are known for their high genetic variability.

Conclusions

This study is the first indication that NoVs circulates widely at the Mother and Child Center and it may become the major cause of gastroenteritis in children with the introduction of rotavirus vaccine in our country.

Key words: Norovirus, Diarrhea, Cameroon, RT-PCR, Chantal Biya Foundation
Background and aims

We want to evaluate the global existed evidence-based guidelines of diarrhea, aims to provide some references for its treatment, and explore the methodology to develop our own evidence-based diarrhea medicine manual of children.

Methods

We have finished systematic retrieve in 6 literature databases containing Pubmed, Embase, CBM, CNKI, VIP, WanFang, and 7 guidelines websites including CGC, NGC, APP, GIN, NICE, SIGN, WHO. The guidelines of diarrhea or acute gastroenteritis in children would be included. There were 2 assessors to evaluate guidelines independently by AGREE II, which included 6 domains (23 items). The ICC was used to value the differences among assessors and analyze the difference of each guidelines

Results

① We included 15 evidence-based guidelines of diarrhea or acute gastroenteritis in children, 14 in English, and 1 in Chinese. ② There were 2 assessors participated in the assessment, and the ICC >0.75, F value high and P value low, which mean the homogeneity among them was good. ③ The quality of 15 guidelines were not high enough, sequence of scores from high to low were the follow: Scope and Purpose (84.5%), Clarity of Presentation (80%), Stakeholder Involvement (46%), Rigor of Development (41%), Editorial Independence (36.5%) Applicability (34%).④ The recommendations of management and treatment were almost consistent.

Conclusions

① The quality of evidence-based guidelines of diarrhea for children should be improved.② In light of the level of evidence for montmorillonite, probiotic and traditional medicine are poor and lack of sufficient high quality research. ③ We recommend the following drug therapy to physicians to treat childhood diarrhea: reducedosmolarity oral rehydration solution, zinc supplements and antibiotic in certain circumstance.
DISCUSSION ON THE BEST TREATMENT SCHEME FOR THE VIRAL ENTERITIS OF INFANTS

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Background and aims

To explore the optimal and simplest drug use scheme for the viral enteritis of infants.

Methods

According to the 2005 guidelines for treatment of diarrhoeal diseases published by the WHO and UNICEF, the children were randomly divided into three groups. The first and second groups were given low-osmotic oral rehydration salts, racecadotril granules, zincic-tonic and probiotics. In addition, the first group was combined with montmorillonite, the second group added traditional Chinese medicine (ErxietingKeli), the third group used low-osmotic oral rehydration salts, racemule granules and a new generation of aibao lactase (including zinc and probiotics). Observe the changes of fecal frequency, quantity, character and appetite improvement of 3 days, 5 days, 7 days, 10 days and 2 weeks after treatment.

Results

Compared with the first group and the second group, the third group showed significant improvement in the 5 days, 7 days, 10 days and 2 weeks after treatment (P < 0.001).

Conclusions

It is the best choice to treat the viral enteritis of infants with low osmotic oral rehydration salts, racecadotril granules and the new generation of aibao lactase.
Background and aims

Clostridium difficile is a major cause of antibiotic-associated diarrhea worldwide. Previous studies showed that the infant carried C. difficile would be a mobile ‘strain bank’ to cause Clostridium difficile infection (CDI) in adults. Therefore, we implemented the study to investigate the C. difficile carrying status in infants and characteristics of isolates in Shenzhen, China.

Methods

Two hundred and thirty-eight stool specimens were collected from infant < 1 year old in Shenzhen, from August 2015 to November 2015. Immunochromatography targeted GDH of C. difficile was used for C. difficile screening and those positive specimens were inoculated in CDIF for anaerobic culture. C. difficile isolates were genotyped by a capillary gel electrophoresis based PCR-ribotyping method, and Toxin A, B and binary toxin coding genes were tested by PCR.

Results

Fifty C. difficile strains were isolated from 238 stool samples, and the isolated rate of C. difficile was 21.0%. 52.0% (26/50) of the C. difficile isolates were toxigenic, and 69.2% (18/26) toxigenic isolates harbored tcdA+tcdB+cdtA-cdtB-. Fifty C. difficile isolates were genotyped as 16RTs, RT017 and RT012 were the commonest genotypes in toxigenic C. difficile isolates; however, that was RT085 in non-toxigenic isolates.

Conclusions

High C. difficile carriage was found in infants younger than 1 year old in Shenzhen, and more than half of C. difficile isolates were toxigenic.
APPLICATION OF IN VITRO FERMENTATION MODEL TO STUDY THE EFFECTS OF OLIGOSACCHARIDE ON CHILDREN WITH INFECTIOUS DIARRHEA

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Background and aims

In vitro fermentation model was used to study the effects of oligosaccharides on SCFA and gas production in the children with infectious diarrhea, which aims to explore the different relationship of intestinal flora disturbance and metabolism between virus and pathogen caused diarrhea.

Methods

There were 31 children with diarrhea in the experimental group and 12 normal children in the control group. The concentration of SCFA in feces was detected, and then the fresh fecal samples were inoculated into the batch fermentation systems, SCFA concentration at 24h and 48h were detected.

Results

1. Total SCFA, acetic acid, propionic acid, butyric acid, isobutyric acid and isovaleric acid in feces of normal children group were higher than those in bacterial enteritis group (P < 0.05); Total SCFA, butyric acid, isobutyric acid and isovaleric acid in the feces of normal healthy children were higher than those in the viral enteritis group (P < 0.05). 2. The levels of total SCFA and acetic acid in enteritis group after 24h and 48h fermentation with all tested oligosaccharides were lower than those detected in normal children and viral enteritis group after fermentation (P < 0.05).

Conclusions

1. The intestinal microbiota of children can use oligosaccharides to produce gases and SCFA which is beneficial. Acetic acid is the highest amount of SCFA produced in oligosaccharides fermentation, followed by propionic acid and Butyric acid. 2. When bacterial enteritis occurs, the amount of intestinal microbiota that can produce the acetic acid by oligosaccharides is reduced, as evidenced by the lower level of SCFA.
PHYLOGENETIC ANALYSIS OF THE VP7 GENES OF G1 AND G3 ROTAVIRUSES CIRCULATING IN CHILDREN IN BEIJING, CHINA IN RECENT TEN YEARS

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Background and aims

The distribution of rotavirus G-types in children appears to be changing over time in Beijing, China, especially more recently with the re-emergence and absolutely predominant circulating of G9 and decline of G3 and G1 rotaviruses which were most common rotaviruses in the past. To understand the evolution and origin of G3 and G1 strains within recent ten years.

Methods

Sequencing and phylogenetic analyses of the nucleotide sequences of the VP7 gene which were conducted on 16 G1 and 19 G3 rotavirus positive samples collected during 2008-2017, respectively.

Results

All the G1 strains in this study were clustered into the VP7 evolutionary lineage VI which including early local field G1 strain T73 (identified in 1998) from Beijing. Interestingly, these G1 strains in Beijing (China) within lineage VI appear to form three different sub-clusters by date. On the other hand, phylogenetic analysis revealed that all 19G3 strains clustered into the same recent G3 lineage a-S4 appearing to share a common origin, and distantly from earlier Beijing field strain T108 (a-S3) and AU-1(a-S1) like strains. Notably, all G1 and G3 strains during the decade in this study both are distant from corresponding vaccine strains contained in the currently licensed rotavirus vaccines RotarixTM and RotaTeqTM.

Conclusions

The factors that influenced the change of distribution of G3 and G1 rotaviruses in Beijing in the recent ten years need to further investigate. Detailed molecular characterization of the entire genome of these strains may help to determine the extent of genetic evolution and the relatedness with circulating distribution.
Leptospirosis is associated with a broad spectrum of severity ranging from subclinical illness following a biphasic course (septicemic and immunologic). Infectious myositis is uncommon but leptospira can act as a trigger for inflammatory muscular disease.

Case Report

A 17-year-old male presented with left hip pain and intermittent limp for 2 weeks that became bilateral and showed no improvement with anti-inflammatory drugs. There was no mention of trauma or fever. He had difficulty walking and complained of diffuse muscular pain, without any decrease in muscle strength or sensory complaints. Laboratory tests showed leucocytes 12.88\times 10^9/L, ESR 29mm/h, CRP 257mg/L, CK 1372 U/L, AST 47U/L, ALT 19U/L, urea 27mg/dL and creatinine 0.85mg/dL. He started flucloxacillin and clindamycin without improvement. Magnetic resonance imaging identified bilaterally a signal change of presumable inflammatory etiology in subcutaneous and muscular tissue (rectus femoris and adductor muscles, pelvic cellular adipose planes and pubic bone). The ecographic and electromyographic findings supported the diagnosis of unspecific myositis. Infectious etiologies, toxics, auto-immune and metabolic diseases were investigated. Because he lived in a rural area he was also investigated for leptospirosis. Leptospira DNA was positive in the urine. He completed doxycycline with favorable response.

The diagnosis of leptospirosis was established late on the evolution and the identification in the immunologic phase suggests a late consequence of the infection by this agent. The association between myositis and leptospirosis can result in a severe and atypical course of the disease. This case emphasizes the non-icteric forms which are often non-specific and may be missed by physicians.
Human coronaviruses (HCoV) are a group of emerging viruses capable of infecting children more frequently than adults. HCoV essentially cause respiratory and enteric disease in humans. To characterize coronavirus infection in the pediatric population.

Descriptive study of coronavirus infection in children hospitalized between 2015 and 2016. HCoV RNA was detected by RT-PCR of respiratory secretions. Demographic, clinical and laboratory parameters were studied.

45 (3.7%) of 1222 samples were positive: HCoV-OC43 (23), HCoV-229E (9), HCoV-NL63 (9), HCoV-HKU1 (2) and non identified HCoV (2) with median age of 2 years at admission. Peak detection occurred in February and March 2016 (20%). 18/45 (40%) cases were in children with underlying chronic disease: neurological disease (5), respiratory disease (3), congenital heart disease (3), and others (7). The diagnosis were upper respiratory infection (18), bronchiolitis (10), acute otitis media (7), pneumonia (5), gastroenteritis (2), conjunctivitis (2) and febrile convulsion (1). 15/45 (33%) children developed complications: hypoxemia (13) and acute respiratory insufficiency (2). One child was admitted to the ICU. Co-infection occurred in 35 (77.8%) cases: adenovirus (11), rhinovirus (10), RSV (8), bocavirus (6), influenza A/B (5), metapneumovirus (4), parechovirus (3), parainfluenza (3) and enterovirus (1). The median duration of hospitalization was 8 days. HCoV-NL63 and HCoV-HKU1 infections occurred in underlying chronic disease (39%). HCoV NL63 was the virus most associated with complications (33%).

HCoVs were infrequently detected in the studied population but may have significant complications and occurred frequently in chronic disease. The role of coinfections is not yet well established.
A CASE OF FASCIOULA HEPATICA WITH EOSINOPHILIA

Background and aims

Fascioliasis is a trematode flatworm infection caused by Fasciola hepatica. The diagnosis of fascioliasis should be considered in patients with abdominal pain and hepatomegaly accompanied by peripheral eosinophilia. Herein we present a case of fasciola hepatica with eosinophilia.

Case: A 2 year-old boy was admitted complaints of anorexia and abdominal pain. His physical examination was normal. He hadn't history of any medicine or food. Complete blood count showed hemoglobin 14.6 g/dl, White blood cell count was 33120/mm^3, absolute neutrophil count was 8450/mm^3, eosinophil count was 12150/mm^3, platelet count was 480000/mm^3. Peripheral blood smear revealed 36% eosinophil, 31% lymphocyte and 25% neutrophile. Bone marrow aspiration was performed and hematologic cause of eosinophilia wasn't detected. Allergic, biochemical tests and stool test for parasitic infections were normal. On ultrasound there was hypoechoic lesions sized 9 mm in liver (Figure 1) Indirect hemagglutination (IHA) revealed positivity for F. hepatica at a titration of 1/640. Liver biopsy was performed from the lesion and there was periodic acid schiff stained eggs on biopsy (Figure 2). Triclabendazole treatment was started at a dose of 10 mg/kg once a day and a second dose was given after two weeks. Because of persistent of eosinophilia third dose treatment was given. After third dose treatment, eosinophilia and nodular lesions resolved. Fasciola hepatica IHA was negative.

Conclusions

Although fascioliasis is rare in children, we should consider it among cause of eosinophilia and triclabendazole is successfully for treatment.
THE PROBLEMS OF TBE DIAGNOSTICS IN CHILDREN IN KAZAKHSTAN

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²Kazakh National Medical University, Infectious and Tropical Diseases, Almaty, Kazakhstan

Background and aims

TBE incidence in Kazakhstan associated with Ixodes persulcatus ticks common in Eastern Kazakhstan and Almaty regions bordering on China. Most symptomatic cases recorded here. The aim of this work was analysis TBE morbidity in children and causes of wrong diagnosis identification in Kazakhstan.

Methods

Clinical analysis, laboratory aetiological diagnostic (ELISA), TBE incidence dynamics and the number of tick bitten persons, including children epidemiological analysis.

Results

In recent years, TBE cases number ranged from 27 to 48 per year, with a tendency to increase, TBE in children were 3 to 8 cases, an average of about 20%. Tick bitten persons number where from 6300 to 11300 also with significant growth, half of them were children. On average, on 237 tick bites recorded 1 confirmed TBE case. According to our data the average TBE virus infection rate of tick is 3%, so the number of TBE cases must be 7 times more and in children – 35 times more. Thus in some patients TBE is not diagnosed.

Conclusions

TBE in children in Kazakhstan occurs in the form of two-wave infection, beginning as acute respiratory disease, pharyngitis or catarrhal tonsillitis. This first wave is usually not detected, not even a suspicion on TBE. The suspicion arises later, when some patients develop a second wave with the failure of CNS. Thus, the suspicion of the TBE should occur in all fever patients who have a history of risk factors of TBE.
Background and aims

TBE cases were recorded mainly in Kazakhstan South-Eastern region (Almaty and Eastern Kazakhstan region - AR and EKR). In AR TBE often occurs without CNS failure and in population IgG detected without TBE evidence in the last in the active natural foci. Therefore, it is important that standard case definition (SCD) had sufficient sensitivity and at the same time specificity. The aim of this work was to improve TBE SCD.

Methods

We have analyzed the sensitivity and specificity of existing TBE SCD using clinical, laboratory (ELISA) and epidemiological methods. The study included 361 confirmed and 417 probable cases in 2007-2016 years.

Results

At the stage of suspected case, in addition to clinical signs, we need to include epidemiological position on "place", - "stay or residence in endemic areas for 30 days (the TBE maximum incubation period) before the disease" that will make SCD more specific. Clinical signs should include, in addition to meningitis/encephalitis, also form without CNS pathology. It is also important for the timely diagnosis of the first wave of infection. In the probable case, detailed risk factors, in addition to tick bite plus, "use raw milk, home-made dairy products, obtained without heat treatment of the milk of cows, goats, sheep".

Conclusions

Developed SCD included in the Regulations on TBE and we start again the analysis of its efficiency. The dialectical contradiction between the sensitivity and specificity of SCD can be neutralized through judicious use of sensitive suspected and specific confirmed step of SCD.
TBE DIAGNOSTICS AND SURVEILLANCE PROBLEMS IN KAZAKHSTAN
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¹Kazakh National Medical University, Infectious and Tropical Diseases, Almaty, Kazakhstan
²Kazakh National Medical University, Pediatric Infectious Diseases, Almaty, Kazakhstan
³Scientific Practical Center Sanitary Epidemiological Expertise and Monitoring, Parasitology, Almaty, Kazakhstan
⁴Scientific Practical Center Sanitary Epidemiological Expertise and Monitoring, Parasitology, Almaty, Kazakhstan

Background and aims

Annually up to 40 TBE cases are registered in Kazakhstan. The work aim was to analyze the TBE clinical and epidemiological manifestations in Almaty city.

Methods

Retrospective analysis of 40 TBE patients in Almaty city for 2011 – 2015 and results of 1000 ticks taken from tick-bitten persons testing to TBEV (in ELISA for antigen) were provided.

Results

The I. persulcatus infection was only in third place- 0.5%; the most frequently reported infection of H. punctata - 1(0.98)%, and D. marginatus – 0.85%. Also there was noticeable infection of R. turanicus (0.33%), D. nivius (0.25%) and D reticulates (0.2%) rarely other species of ticks.

TBE incidence season lasted from April to August with a single peak in June (almost half of cases 17 of 40). Only half of the cases pointed to a tick bite.

6 (15%) received immunoglobulin against TBEV after a tick bite became ill.

Also 3 vaccinated became ill, 2 (5%) not complete vaccination, and 1 (2.5%) completed vaccination.

Half of patients seeking medical assistance at 1-3 days of disease, half of the patients had double-wave fever.

Disease was severe in 1/3 of patients, encephalitis and paralytic effects had developed, 2 of the 40 patients died.

Conclusions

Major gaps in TBE diagnosis in Kazakhstan is the lack of refinement in the history of the alimentary way of infection, does not identify the first wave of disease, lack of alertness of health workers in the epidemiological season, lack of awareness and late uptake.
Background and aims

Echinoccosis or cystic hydatidosis is a zoonotic parasitic disease due to the larval stage of taenia Echinococcus granulosus. In children that are the endangered group that gets the infection initially, it is believed to have special features such as higher rate of lung infection rather than in liver.

The objective was to evaluate the features of this disease in a high incidence setting in Cusco in the Peruvian Andes at 3400 meters above sea level.

Methods

Through observational study and protocolised review of medical records during the last five years. We sought to characterize epidemiologically, clinically and therapeutically a series of 132 patients younger than 20 years diagnosed with echinococcosis through a descriptive analysis of a previous study.

Results

More than 274 cysts and 132 medical records were found and evaluated. In this region hydatidosis affects mainly male (63.6%) and teenagers. The organ most affected was the lungs with 75 cases, in second place the liver 30 cases, and there were 26 cases with both liver and lungs affected. Only 41% presented eosinophilia. The predominant treatment was surgery plus Albendazole (93.3%), the most common surgical approach was right posterolateral in the lung infection (93.1%), and right subcostal laparotomy in the liver parasitation (68.2%).

Table 3. Clinical and pathological differences between gender groups

<table>
<thead>
<tr>
<th>Clinical and pathological features</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at diagnosis</td>
<td>11.7</td>
<td>10.79</td>
<td>11.00</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>12.74</td>
<td>12.29</td>
</tr>
<tr>
<td>Number of cysts</td>
<td>1.87</td>
<td>1.55</td>
<td>3.09</td>
</tr>
<tr>
<td></td>
<td>2.29</td>
<td>2.04</td>
<td>4.14</td>
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<tr>
<td>Diameter (centimeters)</td>
<td>11.6</td>
<td>10.26</td>
<td>11.07</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>13.10</td>
<td>12.55</td>
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<tr>
<td>Percentage of eosinophils</td>
<td>6.28</td>
<td>4.57</td>
<td>9.82</td>
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<td>7.99</td>
<td>5.10</td>
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<table>
<thead>
<tr>
<th>P</th>
<th>Mean CI</th>
<th>Mean CI</th>
<th>Mean CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;0.0</td>
<td>11.49</td>
<td>10.72 – 12.26</td>
<td></td>
</tr>
<tr>
<td>&lt;0.0</td>
<td>2.31</td>
<td>1.81 – 2.82</td>
<td></td>
</tr>
<tr>
<td>&gt;0.0</td>
<td>11.45</td>
<td>10.42 – 12.49</td>
<td></td>
</tr>
<tr>
<td>&lt;0.0</td>
<td>7.57</td>
<td>5.55 – 9.58</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

Results differ from the series at sea level. In our region Echinococcosis affected predominantly male, it had mainly pulmonary localization rather than hepatic, the population most affected was between 10 and 14 years. In our understanding this is the biggest case series evaluated in high altitude until now.

<table>
<thead>
<tr>
<th>Table 2. Localization and therapeutical choice</th>
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<tbody>
<tr>
<td><strong>Localization of the cyst(s)</strong></td>
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<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Lung</td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Liver</td>
</tr>
<tr>
<td>Liver and lung</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td>Retroperitoneal (kidney)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3. Clinical and pathological differences between gender groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical and pathological features</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Mean CI</strong></td>
</tr>
<tr>
<td>Age at diagnosis</td>
</tr>
<tr>
<td>Number of cysts</td>
</tr>
<tr>
<td>Diameter (centimeters)</td>
</tr>
<tr>
<td>Percentage of eosinophils</td>
</tr>
</tbody>
</table>
RENAL ECHINOCOCCOSIS: A REASON FOR A TOTAL NEPHRECTOMY IN A TEENAGER

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\textsuperscript{2}Regional Hospital of Cusco, Cusco, Cusco, Peru

Background and aims

The Cystic Echinococcosis (CE) or hydatidosis is a zoonoses produced by the larval stage (metacestode) of Echinococcus granulosus. It is distributed worldwide. The infection usually is believed to happen at early childhood and being discovered in the adulthood. The most affected organs in high altitude are the lungs according to some descriptive reports.

Methods

We report the case of a 18 year old patient that after he fell off a bicycle, immediately excruciating lumbar pain started and soon after intense haematuria that could not be attributed to trauma itself. Ultrasound and CT scan revealed non-contrast-enhanced cystic images that suggested hydatidosis in the right kidney as well as haemoperitoneum. In addition the hematocrit was decreasing rapidly with severe clinical deterioration of consciousness that made necessary to practice open lumbotomy.

Results

During surgery multiple cysts were discovered inside and outside the right kidney. CT scan with contrast had previously showed the scarce viable tissue so that total nephrectomy was performed after confirmatory exploration. The pathological analysis of the specimen confirmed the layers of hydatid cysts.
Conclusions

Surgical management is the best treatment option provided that appropriate measures to prevent anaphylaxis are taken. Epidemiological data added to image studies have improved the management of this zoonoses. The biggest case series of renal echinococcosis reported 34 cases among children and adults in 1997 but 30 years later the problem prevails in the Andes of Peru.
Background and aims

Zika has been linked to neurological disorders in affected children during gestation, leading to high costs for the individual and society. To mitigate the impact, we decided to supplement routine epidemiological surveillance with a clinical and psychosocial intervention.

Methods

We made a protocol that established, clinical and psychosocial actions developed during gestation, birth and controls of the child in children and families affected by the zika virus. This attention was differential based on the antecedent of exposure to zika and the physical examination to children.

Results

The protocol was socialized to 88.5% of the institutions responsible for healthcare. Of the 2957 pregnant women with zika, 77% had access to ultrasound after diagnosis, where 0.2% of CNS related malformations were detected. 87.9% received psychosocial care and delivery in 76.5% was assisted by gynecology.

The detection of fetal mortality is more frequent in the first weeks of gestation, whereas CNS anomalies are more evident in subsequent weeks. The prevalence of these alterations in children is 1.3%. Currently, the classification of affected children and adherence to the protocol is established.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td><strong>First trimester</strong></td>
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<tr>
<td>Fetal mortality</td>
<td>2.3</td>
</tr>
<tr>
<td>CNS disorders</td>
<td>0.2</td>
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<tr>
<td><strong>Second trimester</strong></td>
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<tr>
<td>Fetal mortality</td>
<td>0.8</td>
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<tr>
<td>CNS disorders</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Third trimester</strong></td>
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<tr>
<td>Fetal mortality</td>
<td>0.03</td>
</tr>
<tr>
<td>CNS disorders</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Conclusions
To deal with new diseases as ZIKA, it is necessary develop programs that accompany the processes of epidemiological surveillance that allow a comprehensive approach to unknown consequences. Currently this cohort of children is being monitored to better understand the complications related to this virus.
RE-EMERGENCE OF PERTUSSIS IN NEONATES: ALARM FOR BETTER COVERAGE OF MATERNAL IMMUNIZATION

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⁵Faculty of Medicine- Chulalongkorn University, Pharmacology, Bangkok, Thailand

Background and aims

Pertussis immunization during pregnancy is an effective way to prevent neonatal pertussis. However, coverage of the vaccine in Thailand is low. This study aims to describe clinical manifestations of neonatal pertussis, patterns of transmission, and pertussis vaccination during antepartum and neonatal periods.

Methods

A case-series of infants with confirmed pertussis. Inclusion criteria: neonates aged < 90 days, a positive nasopharyngeal swab polymerase chain reaction (PCR) for Bordetella pertussis. Laboratory testing was performed at the Department of Medical Sciences, Thai Ministry of Public Health and Center of Excellence in Clinical Virology, Chulalongkorn University.

Results

From January 2013 to June 2017, 9 neonates were diagnosed with pertussis. Median age was 51 days (range 26-71) at diagnosis. Median time from onset to diagnosis was 10 days (range 7-17). All presented during the paroxysmal stage, 4 (44%) had clinical symptoms of cyanosis. All had peak body temperatures < 37.8 C. Lymphocytosis (>9000 per mm3) and leukocytosis (white blood count >20,000 per mm3) were seen in 67% and 44%, respectively. Low erythrocyte sediment rates (ESR <10 mm/hr) was seen in 75%. Neither mother during pregnancy nor neonate had pertussis immunizations. Seven cases (78%) were suspected of contracting from a house-hold member. One neonate had aspiration pneumonia requiring ventilatory support. Treatment included erythromycin (44%) and azithromycin (56%). Median length of stay was 6 days (range 3-14).

Conclusions

Paroxysmal cough, absence of fever, lymphocytosis and low ESR are common manifestations of neonatal pertussis. Maternal immunization with pertussis vaccine during the 3rd trimester should be implemented to prevent neonatal pertussis.
BABESIOSIS IN CHILDREN: THREE CASES REPORT AND LITERATURE REVIEW

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Background and aims

To summarize the clinical characteristics and current status of babesiosis in children.

Methods

The data was retrospectively analyzed for three cases of hospitalized children with babesiosis from January 2014 to December 2015 in department of infectious diseases of Beijing children’s hospital. Using "babesiosis" as the key word, a review of more than 20 literatures in the past 10 years were searched with PubMed.

Results

There was no clear history of tick bites for three cases. Fever was the main manifestation for three cases. Two of the three cases had knee pain. There were no specific positive signs, obvious abnormality of immune function and other susceptibility factors of babesiosis for three cases. In three cases, thick blood smear showed the babesia trophosis, which was the main basis for the diagnosis. Nonspecific laboratory abnormalities had been described in babesiosis. Highly elevated ferritin levels(>2 times normal) were another nonspecific laboratory abnormality in babesiosis. The first case conformed to this characteristic. Given targeted treatment after the diagnosis was clear, the condition improved.

Conclusions

Early diagnosis of babesiosis in children is an important problem that exists, and the disease may be easily overlooked because of the absence of specific symptoms, signs and routine laboratory tests. Detailed inquiry history, if the patient has a suspicious epidemiological exposure history or the existence of babesiosis susceptibility factors, the related laboratory tests could be proposed. Because the target cells of babesia are red blood cells, some patients may have anemia, which may play a role in clinical diagnosis and treatment.
Zika virus (ZIKV), a mosquito-borne arbovirus in the genus Flavivirus, has emerged as a global health security threat because ZIKV infection can cause not only microcephaly in infants but also various neurological disorders including Guillain-Barré syndrome, meningoencephalitis, and myelitis in adults. Despite these severe disease outcomes, currently, neither vaccines nor specific antiviral drugs are available to prevent or treat ZIKV infections. Therefore, development of countermeasures to control ZIKV is urgently needed. Similar to other flaviviruses, ZIKV replicates its plus-strand RNA genome by a virally encoded RNA-dependent RNA polymerase (RdRp). Thus, this RdRp domain in the C-terminal part of the nonstructural (NS) protein 5 is an attractive target for direct-acting antiviral agents (DAAs). In the present study, we cloned and expressed a full-length recombinant ZIKV NS5 to establish an in vitro RdRp assay system using the purified NS5 protein capable of copying viral RNA templates. The purified NS5 containing the N-terminal domain with the methltransferase activity and the C-terminal domain with the RdRp activity showed primer-dependent RNA synthesis activity on a homopolymeric RNA template. It was also able to initiate de novo RNA synthesis from the 3′-ends of both the plus- and minus-strand RNAs of ZIKV. The RdRp activity was found to be enhanced by the N-terminal domain of NS5. The in vitro RdRp assay system established with a full-length NS5 will be useful for understanding the mechanisms of ZIKV RNA genome replication and for the development of anti-ZIKV DAAs.
ENVIRONMENTAL FACTORS AFFECTING OCCURRENCE OF SCRUB TYPHUS IN SOUTHERN INDIA

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²Christian Medical College, Community Health, Vellore- Tamilnadu, India
³National Remote Sensing Centre, Crop Parameter Retrieval Division, Hyderabad, India

Background and aims

Scrub typhus cases are increasing and its spatio-temporal clustering is known. In this study we explore the influence of environmental factors on the spatio-temporal clustering of hospitalized scrub typhus cases in children over a five year period.

Methods

All children <15 years admitted to Christian Medical College, Vellore with scrub typhus between 2010-2014 and belonging to three contiguous districts of Chittoor, Vellore and Tiruvannamalai in southern India were included in the study. Spatial clustering of scrub typhus was explored using the Getis-Ord Gi* hotspot detection analysis. Weekly averages for temperature, humidity, rainfall and normalized difference vegetation index (NDVI) in the neighbourhoods of cases were compared with the weekly count of patients.

Results

There were 419 children admitted with scrub typhus during the study period from the three districts. The number of admitted children were lowest between weeks 7 and 28 averaging <0.5/week and highest between week 34 and week 5 averaging >2.4/week. During the trough and peak periods, average temperature was 29.1°C and 26.3°C, average rainfall was 19.9mm and 26.6mm, average humidity was 61% and 73% and NDVI values were 0.602 and 0.697 respectively. Significant hot spots for scrub typhus cases were identified in one district. Details will be presented as graphs in the poster.

Conclusions

In southern India, higher burden of scrub typhus is observed during the cooler months and is associated with higher rainfall, higher humidity and higher values of NDVI. These observations can be used by health care systems to predict increased scrub typhus occurrence in this region.
Brucellosis is still an important disease in Turkey. The disease may lead to complications and economic loss. In this study we aimed to evaluate family history and clinical characteristics of children with brucellosis.
RE-EMERGENCE OF MEASLES GENOTYPE D8 AMONG THAI CHILDREN, 2016-2017

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1Faculty of Medicine- Chulalongkorn University, Pediatrics, Bangkok, Thailand
2Research Unit in Pediatric Infectious Diseases and Vaccines- Faculty of Medicine- Chulalongkorn University, Bangkok, Thailand
3Faculty of Medicine- Chulalongkorn University, Pharmacology, Bangkok, Thailand
4Thai Red Cross Emerging Infectious Diseases Clinical Center TRC-EID, Bangkok, Thailand
5Faculty of Medicine- Chulalongkorn University, Microbiology, Bangkok, Thailand
6National Institute of Health- Ministry of Public Health, Medical Sciences, Nonthaburi, Thailand

Background and aims

Before 2016, the majority of measles in Thailand was of genotypes D9, B3 and H1. Since 2016, there has been a re-emergence of measles in Bangkok with 71 reported cases per million population. We aimed to describe measles genotype and transmission patterns among children in Bangkok.

Methods

A case series of children aged < 15 years diagnosed measles at King Chulalongkorn Memorial Hospital, Bangkok, Thailand. Diagnosis was based on clinical manifestations and the presence of measles IgM and/or identification of RNA. Measles genotype was identified from nasopharyngeal swab at The Department of Medical Sciences, Ministry of Public Health.

Results

From July 2016-May 2017, 13 children were diagnosed with measles. Eight (62%) were under 1 year, 3 (23%) 1-4 years and 2 (15%) 5-14 years. Nine children (69%) had not been measles vaccination. Ten (77%) children were hospitalized with a median (range) length of stay 5 days (3-27). Five (39%) cases had complications of bacterial pneumonia. Source cases were identified in 7 patients, 3 from household members, 3 nosocomially, and 1 from a neighbour. Four source cases were infants and 3 adults aged between 20-37 years. All children had measles genotype D8. Measles genotype D8 was identified during the same period; 35 specimens (100%) in Bangkok and 206 specimens (63%) from other parts of Thailand.

Conclusions

The re-emergence of measles in Thailand is due to genotype D8. Infants are susceptible to measles and at risk of complications. The source cases are infants and adults. Booster measles vaccine in young adults should be considered.
EMERGING AND ZOONOTIC DISEASE

EPIDEMIOLOGICAL AND CLINICAL ANALYSIS OF 35 CASES OF BRUCELLOSIS IN CHILDREN
Y. Li¹, X. Liu¹
¹Xi’an Children’s Hospital, No3 Department of Infectious Diseases, Xi’an, China

Background and aims

To investigate the epidemiological and clinical characteristics of brucellosis in children and to provide evidence for the reduction of misdiagnosis and mistreatment

Methods

A retrospective analysis was made on the epidemiological characteristics, laboratory examination, treatment and prognosis of 35 children with brucellosis in Xi’an Children’s Hospital between March 2012 and March 2017.

Results

26 cases from the epidemic areas, 9 cases from the city. The rate of unexplained route of transmission in children brucellosis increased, and the cases with irregular fever increased. There were cases of family aggregation. There are multiple organs damage in children, and no specific clinical manifestations. The rate of misdiagnosis is as high as 100%. Brucella serum agglutination test were positive in 24 cases. It should be combined with blood culture or bone marrow culture to improve the diagnostic rate. ESR, CRP and hepatic enzymes increase are common. Early treatment with combined, regular and full course antibiotics is effective for children brucellosis.35 cases were followed up for 3 to 12 months, and no recurrence.

Conclusions

Children brucellosis epidemiologic history is not easy to discover, atypical cases increased significantly, the clinical manifestation is diversified. Therefore, patients with fever over 1 week, from epidemic areas, have related symptoms or eat dairy product without thorough disinfection should be suspected of brucellosis. Check as early as possible to confirm the diagnosis, and begin standard antibiotic treatment, in order to reduce the missed diagnosis, misdiagnose and complications.
Transmission of hepatitis A virus (HAV) is predominately by the faecal-oral route. Sexual transmission has been associated in men who have sex with men (MSM). Between February 2016 and 2017, 13 EU countries reported clusters associated with different HAV sequences of genotype IA. As of May of 2017 Portugal notified 242 cases since December 2016 of which 57% were MSM.

15 year-old boy with irrelevant past history was hospitalized for diarrhea, abdominal pain and jaundice. The investigation revealed hepatitis A. We found no epidemiological context. One week later a 14 year-old boy was admitted with the same symptoms, same absence of a clear epidemiological link and serological evaluation with hepatitis A. Although they lived in the same borough the two patients did not attend the same school, or had extracurricular activities together. In this context genotyping of the virus isolated was requested with determination of the HAV strain VRD_521_2016 of sub-genotype IA (identical viral RNA sequence of 505 nucleotides from the VP1/2A region). At the same time a third case, a 12 year-old boy, with the same symptoms and the same virus was found. The investigation identified a 40 year-old male subject who sold cookies in the borough and had sexual relations with the three patients.

Most cases of HAV are reported in adult MSM. These clusters are considered mainly propagated by person-to-person sexual transmission.

As such in children diagnosed it is very important to find a clear epidemiological link as it can be a first sign of sexual assault.
**Background and aims**

Echovirus 18 (E18) was a significant causative agent of viral encephalitis (VE)/meningitis (VM) in children, however, little E18 epidemiological data is available in mainland China. This study aims to investigate the epidemics of E18 in VE/VM in children of Hebei province in China.

**Methods**

The cerebrospinal fluid samples from children with encephalitis/meningitis at Children’s Hospital of Hebei Province during 2015 were collected for enteroviruses testing by real-time PCR. Enterovirus genotyping was done by BLAST analysis of partial VP1 gene. Phylogenetic analysis was conducted on the complete E18 VP1 gene sequences obtained with specific primers. Potential recombination of the E18 strain was scanned with the Simplot program.

**Results**

Total of 268 pediatric cases (190 male and 78 female) were enrolled into this study. The total positive detection rate of viruses was 64.9%, enteroviruses accounted for 51.1%. E18 was the most predominant among the genotyped enteroviruses, accounting for 74.4%, followed by E30, E6, and so on. E18 strains could be divided into three genotypes (A, B and, C). Genotype C can be further divided into two subgenotypes (C1 and C2), with the support of high confidence values and a mean genetic distance of 0.138. All isolates this study clustered into the C2 subtype. Two obvious crossing sites in the 5’UTR and 2A regions suggested that a potential recombination occurred in E18.

**Conclusions**

E18 was the main causative agent for VE/VM in children of Hebei province, China, in 2015. It was a new potential multiple-recombinant strain, which need further study.
MIRNA21 INHIBITS CVB3 REPLICATION BY TARGETING MAP2K3 EXPRESSION THROUGH TARGETING P38-MAPK SIGNALING PATHWAY
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Background and aims

Coxsackievirus B3 is an important infectious agent for viral myocarditis, pancreatitis and aseptic meningitis. CVB3 replication in the target organ could damage tissue directly. P38 mitogen activated protein kinase (P38-MAPK) involves in the process of CVB3 infection and inhibition of P38-MAPK could decrease CVB3 replication. miRNA-21 was detected to have a higher level in CVB3 infection mice model, and was reverse correlated with MAP2K3 expression, which locates upstream of P38-MAPK. This study aims to identify the importance of miRNA-21 in the process of P38-MAPK signaling pathway and CVB3 replication.

Methods

miRNA-21 and P38-MAPK related protein was detected in CVB3 infection process. CVB3 replication was evaluated in HELA cells in which miRNA-21 was overexpressed compared with control group. MAP2K3 and P38-MAPK were also detected in miRNA-21 overexpression HELA cells.

Results

CVB3 infection could induce alternation of miRNA-21 as well as MAP2K3 expression and P38-MAPK phosphorylation, upregulation of miRNA-21 could inhibit MAP2K3 expression and further phosphorylation of P38-MAPK. Overexpression of miRNA-21 in HELA cells could reduce CVB3 replication by directly targeting MAP2K3 expression, and further phosphorylation of the downstream P38-MAPK while not through alternation of ERK phosphorylation.

Conclusions

miRNA-21 could inhibit CVB3 replication by targeting MAP2K3 through P38-MAPK signaling pathway.
Background and aims

In immunocompromised patients with norovirus (NoV) gastroenteritis, the relationship between fecal NoV load and immediate and long-term complications have not been examined. Quantitative assessment of NoV burden in the stool may prognose clinical outcomes and predict transmission risks.

Methods

From March 2014 to January 2016, NoV positive stool specimens identified by Luminex xTAG Gastrointestinal Pathogen Panel (GPP) were included in this study. NoV real-time quantitative PCR assay was performed to determine NoV genogroup (GI and GII) and viral loads. Medical records were reviewed to obtain the relevant clinical information. Clinical severity of NoV gastroenteritis was classified using modified Vesikari scoring system (MVS).

Results

Among 152 patients with gastroenteritis, the fecal NoV Geometric mean of logarithmic copies (GMLC) per gram of stool (w/w) was correlated with mild (n=85, 7.97±1.55), moderate (n=23, 9.09±1.38), and severe (n=44, 10.39±0.91) episodes of severity by modified Vesikari scoring system (MVS), respectively. Multivariate analysis revealed that high level of NoV load was correlated with GII infections (OR=4.13; 95 % CI=1.62-10.55, p=0.003) and associated with development of severe clinical symptom (OR=5.53; 95 % CI=2.00-7.24, p=0.001) at the time of diagnosis.

Conclusions

In cancer patients with NoV gastroenteritis, infection with GII strains was more common and associated with higher viral load in stool than GI infections. Higher stool NoV load at the time of diagnosis predicts disease severity in this population regardless of infecting strain type.
MOLECULAR EPIDEMIOLOGICAL CHARACTERISTICS OF HEPATITIS A VIRUSES IN KOREA, 2014-2016

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Background and aims: In order to gain insights into the epidemiology of hepatitis A (HepA) outbreaks, monitoring biological characteristics of the circulating viruses is important. Therefore, we carried out sequence-based phylogenetic analyses of HepA viruses that circulated in Korea during 2014-2016.

Methods: Discarded serum from patients diagnosed with acute HepA by the presence of IgM anti-HAV were collected from 9 general hospitals nationwide for about 3 months each year from 2014 to 2016. Polymerase chain reactions (PCR) for sequencing the VP3-VP1 region of HepA virus genomes were performed for genotyping and phylogenetic analyses.

Results: PCR was performed on 33, 28, and 55 IgM anti-HAV positive serum samples collected in 2014, 2015, and 2016, respectively. Of these, HepA virus genomes were amplified in 32 (96.7%), 22 (78.6%), and 54 (98.2%) of the samples, respectively. Analyses of the sequences showed that 96.9% belonged to genotype IA, and 3.1% to IIIA in 2014; 100% to IA in 2015; 88.9% to IA, 7.4% to IB, and 3.7% to IIIA in 2016.

Conclusions: Compared with data from 2010-2011 (unpublished owned data), major changes in the prevalent genotypes of HepA viruses in Korea are observed, with replacement of genotype IIIA by IA. In fact, genotype IA was the most common wild type virus circulating throughout the country by the mid 2000’s. From 2007, IIIA emerged as the prevailing genotype, however, has been declining recently as IA has again become the most common genotype. The causes for these shifts are unknown and further investigations are required.
PECULIARITIES OF THE CLINICAL COURSE OF ENTEROVIRUSIS INFECTION FOR THE YEAR 2016
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Background and aims

Relevance. Enterovirus infection (EI) is a disease of high risk with tremendous contagiousness and the almost overall disease incidence (95%), asymptomatic forms (up to 75%). The purpose of research. Studying peculiarities of clinical course of EI among children for 2016.

Methods

Studies and methods. 135 scenarios of EI among children were examined.

Results

Results. Based on the data received following features of clinical course of EI for 2016 were determined: 68, 8% of cases marked a period in summer and autumn. EI had a slight processing therefore only 18,9% of the patients were hospitalized. The Average age of children with EI is 3,86 ± 0,52 year. Most patients with EI had intensive intoxication (96,7%). 73,4% all patients were followed by a short-term temperature reaction (2,54 ± 0,9 days). Enteritis (39%) and pharyngitis (37%) were dominating clinical forms of the disease, the involvement of respiratory tract was within 29,1%, 18,9% had exanthema and "hand-foot-mouth" syndrome, scaling of palm and foot epidermis had 5,9% of patients, onychomadesis was noted at 1,2 %. Clinical signs lasted for 5, 8 ± 0,9 days.

Conclusions

Conclusions. EI for 2016 was characterized by significant polymorphism of clinical forms with full-blowed intoxication syndrome (96,7%).

Unfortunately, insufficient level of laboratory diagnostics (33,6%) did not allow to conduct sequestration and phylogenetic identification of the virus. High prevalence of EI dictates the necessity of regular supervision and molecularly epidemiological monitoring of the infection at the worldwide level.
NOROVIRUS AMONG ACUTE GASTROENTERITIS CHILDREN AT THE CHANTAL BIYA FOUNDATION BEFORE THE IMPLEMENTATION OF ROTAVIRUS VACCINE IN CAMEROON

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Background and aims

Worldwide, diarrhea is the second most common cause of fatal childhood disease, estimated to cause approximately 1.34 million deaths among children aged below five years. Rotavirus is the leading cause of severe diarrhea in young children and is responsible for approximately one-third of all diarrheal deaths. The incidence of norovirus infection in Cameroon and many other African countries is not known, recently rotavirus vaccine have been implemented within national childhood immunization programs in Cameroon.

Aim: To determine the prevalence of NoV and identify different genogroup at the Chantal Biya Foundation in children presenting gastroenteritis and aged below five years.

Methods

During January 2014, 94 samples were tested for norovirus using enzyme-linked immunosorbent assay, and further genogrouped by one step RT-PCR as describing by Kojima et al and modify by Chuan jay et al.

Results

Twenty (21.27%) of the 94 diarrhoeic stool samples tested for norovirus (NoVs) by ELISA were positive. Genogroup (G) distribution was 10% for GI, 30% for GII, 10% for both Of GI/GII. We obtained 50% of unspecific bands after the electrophoretic migration. One possible cause of this may be the primers we have used in this study developed by Kojima et al to target the ORF of the C region of norovirus genome known for his high genetic variability.

Conclusions

This study is the first indication that NoVs circulate widely at the Mother Child Center in Cameroon and it may become the major cause of gastroenteritis in children with the introduction of rotaviruses vaccine in our country.

Key words: Norovirus, Diarrhea, RT-PCR
COST-EFFECTIVENESS OF ROTAVIRUS VACCINATION IN CAMBODIA

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Background and aims

Rotavirus infections cause considerable morbidities and mortalities among children under 5 years old in Cambodia, a Global Alliance for Vaccines and Immunization (GAVI)-country. The World Health Organization (WHO) recommends the inclusion of rotavirus vaccination (RV) in all national immunization programs. The present economic analysis assesses the value of introducing RV in Cambodia.

Methods

A published static, deterministic, population model was adapted to Cambodia to assess the cost-effectiveness of RV among children under 5 years of age over a 1 year time horizon uniformly covered with vaccination. Published data was used for input. Analysis was conducted from the government perspective. Vaccine efficacies from low-income countries settings were used: 61% against severe cases and 50% against moderate cases. All costs were updated to United States Dollar (USD) values of 2016 and a 3% discount rate was used for Quality-Adjusted Life Years (QALY) gained.

Results

At a coverage rate of 92%, the RV program could substantially reduce the rotavirus-related diarrhoea and associated deaths for children under 5 years old over 1 year (87,906 mild-to-moderate cases, 7,572 severe cases and 1,011 deaths). RV was estimated to be very cost-effective under the threshold of 1 Gross Domestic Product (GDP) per capita for Cambodia (1,159 USD in 2016) with an incremental cost-effectiveness result of 42.38 USD/QALY gained.

Conclusions

RV is very cost-effective in Cambodia and may be considered to be included in the national immunization program to improve health in young children.
The continuous surveillance of epidemiological characteristics and etiology of hand, foot and mouth diseases (HFMD) is important for the definition of therapeutic and prophylactic intervention strategies in China. This study aimed to monitor the epidemiological characteristics of HFMD and prevalent serotypes of enteroviruses causing the outbreaks of HFMD in Shanghai during 2010~2016.

The citywide surveillance data were used to analyze the epidemiologic characteristics of the HFMD outbreaks in Shanghai.

From 2010 to 2016, a total of 337,041 HFMD cases were notified and 1,716 (0.51%) were severe. The attack rates of HFMD in Shanghai were 1.62~2.82/1000 in the entire population and 37.23~66.54/1000 in children < 5 years old. In terms of proportion of HFMD and severe cases in the specific population, male, migrant population and children <5 years accounted for 59.33%~61.48% and 62.26%~73.77%, 45.34%~62.40% and 72.01%~85.71%, and 79.16%~86.08% and 82.86%~94.89%, respectively. HFMD peaked from April and July. The detection rates of EV71 and Coxsackievirus A16 (CA16) were 73.08%~100% and 0%~2.90% in severe HFMD cases, 19.64%~48.74% and 2.02%~23.69% in uncomplicated inpatients, and 8.36%~33.39% in mild community cases, respectively. The CA6 and CA10 in mild community cases in 2015~2016 accounted for 40.51%~45.11% and 1.64~2.50%, respectively.

The annual HFMD outbreak occurred in Shanghai during 2010~2016. Children <5 years old, migrant children and male were the major susceptible population. EV71 and CA16 were the predominant pathogens of HFMD during 2010~2014 and CA6 was predominantly prevalent in 2015~2016. EV71 remained the major pathogen responsible for severe HFMD.
Background and aims

Enterovirus 71 (EV71) -associated hand, foot and mouth disease (HFMD) causes significant morbidity and mortality, leads to some severe neurological complications, and poses a serious burden on the health of children and the public. Due to the lack of effective drug treatment, the vaccine is the main method to control the disease. This article summarizes EV71 vaccine development progress and application status in China.

Methods

Through literature retrieval, all documents related to EV71 vaccine research and evaluation, clinical trial and application since 2001 are reviewed and summarized.

Results

Fifty documents are retrieved from the database. Varieties of EV71 vaccine are in the development. Three inactivated vaccines have completed phase III clinical trials. Of them, the vaccine developed by Chinese Academy of Medical Sciences and Sinovac Biotechnology has been approved in Dec.2015. Three vaccines yield sound safety, efficacy and immune response in clinical trials. EV71-associated HFMD prevention rate is 90% ~ 97.3%, and severe case protection 100%. After one-year two-pin base immunization, 1-pin boosted inoculation is likely to generate long-term protection of the disease.

Conclusions

EV71 vaccine in China is in continuous progress, along with the collection of larger sample size and follow-up monitoring data, including safety, efficiency, EV71 genotype and gene recombination. Vaccine applications are still confronted with challenges of preventing other enteroviruses such as Coxsackievirus A16 and Echovirus. Further efforts are needed to develop multivalent broad-spectrum high-performance enterovirus vaccine and to combine with the pentavalent vaccine and other immunization.
EXPRESSION OF NEGATIVE COSTIMULATORY MOLECULES IN PERIPHERAL BLOOD T CELLS AND NK CELLS OF HAND FOOT AND MOUTH DISEASE

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Background and aims

To explore the role of negative costimulatory molecules in hand foot and mouth disease (HFMD) immune response.

Methods

Clinical data of 64 children with HFMD were collected from January 2016 to December 2016 in Guangxi. The patients were divided into fatal group, severe group and mild group, meanwhile, 15 healthy children were collected as control group. Flow cytometry was used to detect the proportion of T cell subsets and NK cells of the 79 cases and the expression level of the negative costimulatory molecules PD-1, Tim-3, LAG-3 and CTLA-4 on the T cell subsets and NK cells.

Results

The percentage of CD3⁺T cells, CD4⁺T cells, CD8⁺T cells and CD3⁻CD16⁻CD56⁺ cells in 64 HFMD cases were significantly lower than control group and the fatal group was the lowest (P<0.05). The expression level of PD-1 in fatal group was significantly higher than mild and control groups (P<0.05). The percentage of CD4⁺T cells and CD3⁻CD16⁻CD56⁺ cells in the HFMD cases was negatively correlated with PD-1 expression (P<0.05). The expression level of Tim-3, LAG-3, CTLA-4 on the T lymphocytes and NK cells among all groups were no significant difference (P >0.05).

Conclusions

There are T lymphocytes, NK cell immune dysfunction in HFMD children and T lymphocyte and NK cell function are depleted in fatal HFMD cases. High expression of PD-1 may inhibit T lymphocyte and NK immune function, and participate in the pathogenesis of HFMD.
THE MECHANISM OF RECOMBINANT HUMAN INTERFERON A1B AGAINST ENTEROVIRUS 71
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Background and aims
Clinical studies have confirmed that recombinant human interferon alpha 1b (IFN-α1b) can effectively alleviate the symptoms of children with hand, food and mouth disease (HFMD) induced by enteric viruses infection. However, the effect of IFN-α1b on Enterovirus 71 (EV71), one of the main pathogens of HFMD, especially those severe cases, still remains elucidated.

Methods
The inhibition of IFN-α1b on EV71 RNA and VP1 protein synthesis and the protection against EV71 infection were investigated in rhabdomyosarcoma (RD) cell line. The effect of IFN-α1b induced transmembrane protein IFITM3 on EV71 invasion was also evaluated.

Results
When treated 12h before or 1h after EV71 infection, IFN-α1b present a IC⁵₀ 258.53 IU/mL and 2113.58 IU/mL with SI >16497 and >3271, respectively, suggesting that IFN-α1b has obvious anti EV71 activity, and IFN-α1b treatment before EV71 infection is more effective. This study also showed that IFN-α1b significantly inhibited EV71 RNA replication and VP1 protein synthesis, and delayed the progeny virus release, which may prevent EV71 invasion by inducing IFITM3 expression.

Conclusions
IFN-α1b has anti EV71 activity and can act as an antiviral agent by influencing the viral life cycle including invasion, replication, assembly and release.
PATHOGEN ANALYSIS OF HERPANGINA AND PHARMACODYNAMICS STUDY OF RECOMBINANT HUMAN INTERFERON α1b ON COXSACKIE A VIRUS IN VITRO

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Background and aims

To study the epidemiological characteristics of children with herpangina in northern China in 2016 and the protection of recombinant interferon α1b (IFN-α1b) against Coxsackie A virus (CV-A) infection in vitro.

Methods

Throat swab samples were collected from children with herpangina in 4 provinces and cities of northern China from May to September in 2016. RNA of viruses were exacted and used for the universal detection of enterovirus and further pathogen type analysis by RT-PCR and BLASTn alignment. The cell protective effects from isolated CV-A viruses of IFN-α1b were determined by MTT and LDH methods.

Results

102 out of 196 samples show enterovirus positive and the types of 66 pathogenic viruses were confirmed. CV-A10 accounted for 45% (30/66) followed by EV71 virus infection with 44% (29/66). Each of CV-A 4, CV-A 5, CV-A 16 accounted for 3% (2/66) and only one shows CV-A6 infection (2%, 1/66). The inhibition of cell proliferation induced by CV-A viruses infection were attenuated by IFN-α1b in a dose-dependent and time-dependent manner. Among all the enteric virus strains which have been tested, CV-A 6 shows the most susceptibility to IFN-α1b, followed by CV-A 16, CV-A 4 and CV-A 10.

Conclusions

CV-As and EV71 are still the main pathogens inducing herpangina in north area of China. IFN-α1b shows the significant protective effect against enteric virus isolated from clinics in a dose and time dependent manner in vitro.
ROTAVIRUS VACCINE IMPACT ON TRENDS IN TOGOLESE CHILDHOOD DIARRHEA HOSPITALIZATIONS

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Background and aims

Rotavirus is the leading cause of childhood diarrhea worldwide. We evaluated impact of the monovalent rotavirus vaccine (RV1) on Togolese children hospitalizations with diarrhea, third year after the vaccine introduction in the national immunization schedule in June 2014.

Methods

We conducted review for hospitalization registers at five hospitals to assess trends in diarrhea hospitalizations among children aged <5 years. For vaccine impact analysis, the pre-vaccine period was defined as July 2010-June 2014 and the post-vaccine period was July 2014-June 2017.

Results

During the pre-vaccine period, 21,992 children aged <5 years were hospitalized and 3,196 (14%) of them with diarrhea (range, 12%-17%), declining to 9% (38% reduction) in the first post-vaccine year and to 7% (54% reduction) in the third post-vaccine year. Declines were most marked among infants following vaccine introduction with 46%, 52% and 62% reduction in the first, the second and the third post-vaccines years, respectively.

Table 1: Number and proportion of all-cause diarrhea hospitalizations from registers, by hospitalization year and patient age, three regional hospitals and two teaching hospitals, following implementation of monovalent rotavirus vaccine in Togo

Conclusions

We report rapid and marked reduction in the number of childhood diarrhea hospitalizations in the first three years post - RV1 implementation in Togo. It is necessary to monitor long-term vaccine impact on diarrhea disease burden through continued hospitalization registers review.
**EFFECT OF NONINVASIVE VENTILATION ON PREVENTION AND TREATMENT OF NEUROGENIC PULMONARY EDEMA IN SEVERE HAND FOOT AND MOUTH DISEASE**

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**Background and aims**

To investigate the efficacy of noninvasive positive pressure ventilation on prevention and treatment of Neurogenic pulmonary edema (NPE) in severe hand foot and mouth disease (HFMD).

**Methods**

228 patients with severe HFMD hospitalized in emergency ward and PICU of Children’s Hospital of jiangxi province between May 2011 and April 2014. The patients were divided into three groups: the control group (n=70), the NCPAP group(n=108), the ventilation group (n=50), on the basis of conventional therapy plus invasive mechanical ventilation.

**Results**

The total efficiency rate of the stage 2 of CPAP group compared with the control group and ventilation group were no significant difference (P=0.26, 0.156). The hospitalization duration in NCPAP groups (4.5 ± 1.8 days) was higher than that ventilation groups (2.3 ± 1.8 days), which were significant difference (P=0.00). The blood glucose (9.8 ± 4.1 mmol/L) of the ventilation groups was higher than that of NCPAP groups(7.4 ± 2.2 mmol/L), which were showed significant difference (P=0.05). The mortality was significantly higher in stage 3 of the ventilation group (5/40, 12.5%) than that of NCPAP group(0/38, 0%, P=0.001). There were 6 patients in grade 2 of the ventilation group developing to grade 3 , which were (6/10, 60%) higher than that (5/70,7.14%) of the NCPAP group(P=0.00). 5 patients in grade 3 of the ventilation group developed to grade 4, which were (5/40 , 7.14 %) higher than that (0/38, 0%) of the NCPAP group.

**Conclusions**

Noninvasive positive pressure ventilation may be more advantages in improving symptoms, preventing disease progression and NPE for the stage 3 of severe HFMD.
ENTERIC VIRUSES

PROFILES OF HUMAN ENTEROVIRUSES ASSOCIATED WITH HAND, FOOT, AND MOUTH DISEASE IN NANJING, CHINA IN 2016

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Background and aims

In this study we aimed to investigate the profiles of human enteroviruses (EVs) associated HFMD outbreak in Nanjing, Jiangsu Province in 2016.

Methods

A total of 1,337 specimens were collected from HFMD cases in Children’s Hospital of Nanjing Medical University in 2016, and the clinical data were analyzed.

Results

The most popular serotype was CV-A6 (393/1337, 29.39%), followed by EV-71 (282/1337, 21.09%), CV-A16 (73/1337, 5.46%), and CV-A10 (67/1337, 5.01%) after serotyping analysis. While EV-71 infections mainly occurred between April to July, CV-A6 infections spread from April to September. Most were mild cases, and the major pathogen to cause severe symptom was EV-71. Children aged from 47 to 87 weeks and from 108 to 202 weeks had the highest risk of infection with HFMD. More cases were reported from the city than rural areas, which indicated not only high risk of HFMD with high population density, but also the lack of data for mild cases in rural areas. Among 145 cases with effective follow-up, 14 cases (14/145, 9.66%) had at least one fingernail or toenail falling off (the most had 10 fingernails and 2 toenails) after infection.

Conclusions

The profiling of EVs associated with HFMD will provide important information on the prevention and management of HFMD. The leading causative agent was CV-A6, but most severe cases were caused by EV-71 in Nanjing area in 2016. More attention should be paid to children in rural areas and children not in childcare.
THE CLINICAL CHARACTERISTICS ANALYSIS OF ENTEROVIRUS INFECTION IN ACUTE RESPIRATORY TRACT INFECTION AMONG CHILDREN

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Background and aims

To study the infantile herpangina and hand-foot-mouth disease with clinical characteristics of lower respiratory tract infection.

Methods

We retrospectively analyzed clinical data of 183 hospitalized children with Enterovirus infections in the Pediatric Wards of Baoan Maternity and Children's Hospital Affiliated to Jinan University from August 2016 to June 2017, which have secondary lower respiratory tract infection (respiratory tract infection group, which was divided into two group, hand-foot-mouth disease group and herpangina group), 431 hospitalized children as control group, which without acute lower respiratory tract infection (which was divided two group, hand-foot-mouth disease group and herpangina group).

Results

The incidence of children with respiratory tract infections in the intestinal virus was 35.6%. Bronchitis, asthmatic bronchis and pneumonia were the most frequent complications in children with Enterovirus infections. Among respiratory tract infection group, most of the cases were the children aged 6m~3 years, and the high incidence period was June and October; there were statistically significant differences between respiratory tract infection group and control group (P<0.05). Among the 183 cases of respiratory tract infection group, 176 cases had fever (96.5%). All cases had cough, 28 cases had wheeze (15.6%), and 13 cases had breathlessness (7.10%). Most of the children respiratory tract infection group had anemia, there were statistically significant differences between respiratory tract infection group and control group (P<0.05). The changes of the chest radiograph in respiratory tract infection group were texture shadows, disorders and some flakes.

Conclusions

Most of the cases were the children aged 6m~3 years, and the high incidence period was June and October. The major pathogen was EV71, then CVA16. Enterovirus complicated by mycoplasma infection occur frequently, too.
ANALYSIS ON THE SEQUENCE OF THE WHOLE GENOME OF AN ISOLATED ENTEROVIRUS 71 STRAIN

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Background and aims

An enterovirus 71 (EV71) strain Query was isolated from a patient specimen in 2015.

Methods

In order to known about its genetic evolution, this study amplified gene fragment of the isolated stain by RT-PCT and carried out sequencing of the total genome. The homology and genetic evolution of the gene sequence of the virus strain in the study were analyzed.

Results

The results showed that the isolated EV71 strain in this study had higher homology of nucleotide sequence and amino acid sequence with other virus strains, which was 80%-97% and 88% to 92%, respectively, but it had lower homology with Cox.A16 (homology of nucleotide sequence and amino acid sequence of Cox.A16was 81% and 79%, respectively). Compare of homologous sequence at the encoding region VP1 demonstrated that the experimental isolated strain EV71 had higher homology of amino acid sequence at VP1 region with other virus strains.

Conclusions

Genetic evolution of nucleotide sequence at VP1 region of the identified strain and other EV71 strains was analyzed, and the results demonstrated gene sequence at VP1 region and 5'UTR region of the isolated strain andSDLY017 strain was at the same branch, both of which belonged to C4a, a subtype of type C4.
ANALYSIS OF PERIPHERAL BLOOD WBC COUNT, N% AND CRP IN CHILDREN WITH HERPANGINA
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Background and aims
To summarize the changes of leukocyte count, N% and CRP in peripheral blood of outpatients suffered with Herpangina.

Methods
To collect and analyze the results of peripheral blood test of outpatients suffered with Herpangina in our hospital from April 1, 2017 to July 1, 2017.

Results
In 3562 Herpangina cases, white blood cells decreased 453 cases (12.72%), white blood cells increased 1161 cases (32.59%), and normal white blood cells 1948 cases (54.69%). N% reduced 352 cases (9.88%), N% normal 2336 cases (65.58%), N% increased 874 cases (24.54%); CRP normal 2917 cases (81.89%), CRP increased 645 cases (18.11%); Both WBC, N% and CRP increased 186 cases (5.22%).

Conclusions
Herpangina is mainly caused by enteric viruses infection. Peripheral white blood cell count, N%, and CRP can be reduced, normal or increased. Herpangina combined or secondary bacterial infection should be considered when the peripheral white blood cell count, N%, and CRP increased at the same time.
THE TREATMENT ANALYSIS OF ANTI-601 MIXTURE ON THE DISEASE ENTEROVIRUS 71 INFECTED IN CHILDREN
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Background and aims

To investigate the effect of Anti-601 mixture on hand foot and mouth disease (HFMD) caused by enterovirus 71 (EV71) in Nanjing Children’s Hospital.

Methods

270 children with HFMD EV71 infected in Nanjing Children’s Hospital from January 2013 to February 2017. Children in group A were treated with Anti-601 mixture, while those in group B were treated with ribavirin. And children in group C were treated with Anti-601 mixture and ribavirin. The effect was judged through clinical efficacy, immune function, prognosis and side-effect after 7 days as the treatment course.

Results

The total effective in group A was 78 cases (86.6%), while that in group B was 79 cases (87.7%). Better therapeutic effect was noted in group C with 81 cases (91.1%). The time of therapy in group C staying in hospital, fever, rash and oral ulcer was shorter than that in in group A and B (p<0.05). There was the lower incidence of severe HFMD in group C (p<0.05). The counts of CD3 + T-cell, CD4 + T-cell, CD8 + T-cell and CD4+ / CD8+ had an increasing tendency in all groups after the treatment. The counts of CD3 + T-cell, CD4 + T-cell, and CD4+ / CD8+ increased significantly in group A and C (p<0.05). There was no severe adverse reaction in each group.

Conclusions

Anti-601 mixture could effectively alleviate clinic symptoms, improve cell mediated immunity function of children EV71 infected, reduce the probability of the occurrence of severe HFMD, and ribavirin combination effect is more significant.
ASSOCIATION OF SINGLE NUCLEOTIDE POLYMORPHISM RS5743303 IN THE PROMOTER REGION OF THE TLR3 GENE WITH SEVERE EV71 INFECTION IN A CHINESE POPULATION
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Background and aims

A possible association between EV71 infection in a Chinese population and the single nucleotide polymorphism (rs5743303) in promoter of the TLR3 gene, was investigated.

Methods

The genotypic and allelic frequencies of these polymorphisms were analyzed in 221 patients, including mild cases (167) and severe cases (54), as well as in a control population (175 randomly selected healthy children). EV71 virus nucleic acid is positive in children with throat swab, feces, cerebrospinal fluid through RT-PCR detection. The improved multiplex ligation detection reaction (iMLDR) method was used to detect the TLR3 rs5743303 polymorphism. The Interferon α/β and IL-10 concentration in serum or CSF was determined using a commercial enzyme-linked immune sorbent assay kit (R&D System, Minneapolis, MN). All statistical analysis was carried out using the SPSS16.0, and a P-value less than 0.05 was considered significant.

Results

(1) The frequencies of the TLR3 A allele was significantly higher among the severe patients with EV71 infection compared with the control group (87 vs. 78.3 %, odds ratio (OR)=1.862, 95 % confidence interval (CI)=1.006-3.449, p = 0.045).

(2) Serum IFNα levels in AA carries (9.34±1.24pg/ml) was lower significantly compared to AT and TT carries (46.24±14.25pg/ml, 88.87±6.28pg/ml) in severe EV71-infected patients (p<0.05). but no significant differences were observed in CSF IFNα levels among different genotypes in patients with EV71 infection. The IFN β had no difference in different genotype in patients’ serum and CSF.

Conclusions

The polymorphism of rs5743303 in TLR3 gene is relevant to EV71 infection, especially in severe EV71 infection.
Association of the Polymorphism of rs1799822 in CPT II gene with Enterovirus71 Encephalitis in Chinese Children
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Background and aims

Mutations of CPTII gene cause CPT II deficiency and affect mitochondrial fatty acid β-oxidation. Associations and mechanisms of CPT II gene with EV71 encephalitis need to be elucidated. The purpose of this study is to investigate whether the polymorphism of rs1799822 in CPT II gene is related to EV71 encephalitis or not.

Methods

This study collected 406 cases and 348 normal children as our subjects. Grouping was performed according to the difference of laboratory examination and clinical manifestations. We used the improved multiplex ligation detection reaction (iMLDR) technique to detect the polymorphism of rs1799822 in CPT II gene. All statistical data was processed by SPSS16.0 software.

Results

(1) There was no significant difference in age and gender between the EV71 infection group and the control group (p=0.203 vs. p=0.857).

(2) The frequency of AG+GG genotype and G allele in EV71 infection group was significantly lower than controls (p=0.012, OR=0.635, 95%CI=0.445-0.905 vs. p=0.022, OR=0.685, 95%CI=0.495-0.948); and so is in severe EV71 infection group.

(4) In EV71 infection group, compared with the AG+GG genotype, AA genotype group had higher white blood cell count and C-reactive protein (p=0.044 vs. p=0.000), and EV71 encephalitis group had the same results (p=0.000 vs. p=0.000). AA genotype in EV71 encephalitis group had a longer duration of fever than AG+GG genotype (p=0.041).

(5) The blood ATP level in AG+GG genotype of EV71 encephalitis group was significantly higher than that in AA genotype (p=0.001).

p(p=0.009, OR=0.554, 95%CI=0.354-0.867 vs. p=0.021, OR=0.619, 95%CI=0.410-0.933).

Conclusions

The polymorphism of rs1799822 in CPTII gene is relevant to EV71 encephalitis, and may be a protective factor of EV71 encephalitis, especially in severe EV71 encephalitis.
IN THIS STUDY, WE EVALUATED THE POSSIBLE ASSOCIATION OF THE IL-10-1082A/G GENETIC POLYMORPHISM WITH THE SEVERITY OF EV71 INFECTION IN CHINESE HAN CHILDREN.

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Background and aims

In this study, we evaluated the possible association of the IL-10-1082A/G genetic polymorphism with the severity of EV71 infection in Chinese Han children.

Methods

A total of 384 EV71-associated HFMD patients and 317 healthy controls were included in this study. An improved multiplex ligation detection reaction (iMLDR) technique was used to detect the IL-10-1082A/G polymorphism and detected the plasma IL-6 and IL-10 levels by enzyme-linked immune sorbent assay. Statistical analysis were performed using the SPSS16.0 software.

Results

(1) No statistic differences were found in genotype distribution (p=0.413) and allele frequency (p=0.183) between the healthy controls and the EV71-infected cases.

(2) The presence of the IL-10-1082GG homozygotes (p=0.042), and the IL-10-1082GG/AG genotype (p=0.019) in mild cases was significantly higher than in severe cases. And the frequency of G allele was obviously elevated in mild cases than in severe EV71-infected cases (p=0.01, OR=1.6, 95%CI=1.1-2.3).

(3) In EV71-infected patients, the IL-10-1082AA genotype patients had obviously elevated duration of fever, the counts of white blood cell, C-reactive protein level, blood glucose, as well as abnormal EEG than in carriers of G allele (p=0.038; p=0.013; p=0.014; p=0.021; p=0.035).

Conclusions

There is a relationship between the polymorphism of IL-10-1082A/G and the severity of EV71 infection in Chinese Han children. The IL-10-1082 G allele is associated with the elevated IL-10 levels, regulated the host pro-/anti-inflammatory responses, which could be a protective factor in the development of EV71 infection.
MMP-2/9 POLYMORPHISM AND SUSCEPTIBILITY TO SEVERITY OF ENTEROVIRUS-71 INFECTION IN A CHINESE POPULATION
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Background and aims

The primary aim of the present study was to evaluate associations between the functional MMP-2 rs243865 and MMP-9 rs3918242 gene polymorphism and the deficit and severity of EV71 infection in a Chinese population.

Methods

The MMP-2 rs243865 and MMP-9 rs3918242 gene polymorphism were detected in EV71-associated hand, foot and mouth disease (HFMD) patients (n=267), including mild cases (n=216), severe cases (n=51) and healthy control subjects (n=291), using an improved multiplex ligation detection reaction (iMLDR™) technique. The plasma levels of MMP-2 and MMP-9 were determined by enzyme-linked immunosorbent assays.

Results

The frequency of T allele of MMP-2 rs243865 in EV71-infected patients was significantly higher than that of controls (OR=1.734, 95%CI=1.179-2.550, p=0.005), moreover, the presence of the T allele was also more frequently found in severe cases (OR=1.739, 95%CI=1.146-2.639, P=0.009). No statistical differences were found in the genotype distributions, allele frequencies and carriage frequencies in MMP-9 rs3918242 between EV71-infected patients and controls(OR=0.742, 95%CI=0.377-1.462, p=0.387), however, The presence of the T allele was significantly higher in cases of EV71 encephalitis(OR=1.491, 95%CI=0.994-2.236, P=0.037). There were significant increases of plasma levels of MMP-2 and MMP-9 in EV71-infected patients as compared to normal controls. Further, In EV71-infected patients, the plasma levels of MMP-2 in (CT+TT) genotype were significantly elevated compared to those of the CC genotype(513.6 ± 166.2ug/L VS 483.8 ± 82.6ug/L, P <0.05).

Conclusions

T allele of MMP-2 rs243865 and MMP-9 rs3918242 were associated with susceptibility to EV71 severe infection in Chinese patients.
A NEW ENTEROVIRUS 96 STRAIN CIRCULATING IN GUANGDONG, CHINA REVEALED BY HIGH THROUGHPUT METAGENOMICS SEQUENCING CAUSES HAND, FOOT AND MOUTH DISEASE

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Background and aims

To analyze a new Enterovirus 96 (EV-96) strain as a sole pathogen causing hand, foot and mouth disease (HFMD).

Methods

A new Enterovirus 96 (EV-96) strain as a sole pathogen from the stool of a patient diagnosed with hand, foot and mouth disease (HFMD) by metagenomics sequencing.

Results

In this study, we identified a new Enterovirus 96 (EV-96) strain as a sole pathogen causing hand, foot and mouth disease (HFMD). Genomic comparison showed our strain was closest to strain EV-96-05517 (85% identity), which has also been discovered in Guangdong province. The whole genome sequence of EV-96 has been submitted to GenBank, accession number: KR919804.

Conclusions

It was the first time employed metagenomics sequencing in HFMD study, as well as the first time identified EV-96 was associated with HFMD.
Background and aims

By conducting a contrast analysis, we came to discuss the clinical significance of the level of serum Vitamin A (VitA), Vitamin D (VitD) and Vitamin E (VitE) on the infant patients with enteritis.

Methods

The research was done in Yinchuan Maternity and Child Care Hospital from May 2015 to May 2017. The serum test (VitA, VitD, and VitE) was conducted for the 326 infant (0-3 years old) with RV enteritis, the 80 infant with bacillary enteritis and the 80 healthy infants. One week after the infant with enteritis were cured, their serum (VitA, VitD, and VitE) was retested along with a comparative analysis on the above test results.

Results

The enteritis group lacks VitA and VitD with low concentrations of VitE. The VitA of the RV enteritis group was lower than that of the bacillary enteritis group (p<0.01); the VitA of enteritis group was lower than that of the control group (p<0.01). No statistical significance was spotted for VitD and VitE in RV enteritis group and bacillary enteritis group (p>0.05). VitD and VitE of enteritis group were lower than those of the control group (p<0.01). After the infant of the enteritis were cured, their VitA, VitD, and VitE didn’t show statistical significance in comparison with the levels before the treatment (p>0.05).

Conclusions

The lack of VitA and VitD along with low concentrations of VitE will accelerate the onset and development of RV enteritis and bacillary enteritis. The supplement of VitA, VitD, and VitE can prevent infants from contracting RV enteritis and bacillary enteritis.
HIV

FEASIBILITY OF HOME-BASED HIV COUNSELING AND TESTING IN SCALING UP PMTCT AMONG WOMEN DELIVERING AT HOME IN GEITA DISTRICTS COUNCIL, TANZANIA

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Prevention of mother-to-child transmission of HIV (PMTCT) reduced pediatric HIV infection. For a woman to be enrolled in the program, she has to attend at the health facility for ANCs (Antenatal Clinics), or tested at the health facilities when goes for delivery. While around 60-70% of pregnant women had HIV counseling and testing for their last pregnancy implemented at the ANCs, 49% of women in Tanzania do not deliver at health facilities where they can be enrolled for PMTCT services in case are HIV infected. Delivering at home is not only a missed opportunity for knowing ones’ HIV status but also increases chances of Mother to Child HIV Transmission.

We conducted a household survey to test the feasibility of home-based HIV counseling and testing (HBHCT) in scaling up PMTCT to Women delivering at home (WDH) in Geita district council, Tanzania

Of the 993 women participated in the study, 981 (98.8%) accepted HBHCT. Of the 565 WDH participants, 562 (99.4%) accepted HBCT. 52 (5.3%) [95%CI: 2.1-12.8%] of those accepted HBHCT were HIV positive. Of the 52 HIV positive women, 26 (50%) were newly diagnosed during the survey, only three children were HIV positive. Of the positive HIV women, 21 (40.4%) were enrolled in the PMTCT. While Of the 32 HIV positive participants who delivered at home, 8 (25.8%) were enrolled in the PMTCT.

HBHCT is acceptable and uptake is high and can be used to scale up PMTCT to WDH. We recommend further evaluation of HBHCT in linking HIV positive to care
INFLAMMATION HIERARCHY IN PERINATALLY HIV INFECTED INDIVIDUALS IN THE FACE OF CART EFFECTED SUPPRESSION OF VIRAL REPLICATION AND MAINTENANCE OF NORMAL LEVELS OF CD4 CELLS

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Background and aims

It is unclear what additional measures would best reflect clinically relevant immune activation in HIV infected youth. We reported that IP10 is a sensitive marker of persisting inflammation in a pediatric HIV infected population. The relationships of IP10 with established clinical markers of inflammation are not established for HIV- infected youth.

Methods

We include 33 perinatally HIV+ individuals on cART 17 of whom are in good clinical status with respect to HIV disease (HIV RNA <50 copies/ml and CD4% ≥ 25) and 11 HIV- controls. We measure plasma IP10 levels by Luminex system and CD8+ T cell activation (HLA-DR+ or CD38+) by flow cytometry. Wilcoxon rank-sum is used to compare groups.

Results

The majority (88.2%) of patients classified in good HIV clinical status have one or more abnormal findings among the tested makers of immune activation characterized by a hierarchy in the expression of markers of inflammation (IP10> CD8+HLA-DR+>CD8+38+). Concomitant elevation of IP10 with CD8+HLA-DR+ is the most frequent pattern found in these patients. Interestingly, within this group of patients there is a notable discordance in immune activation when measured as CD8+HLA-DR+ (65%) as compared to CD8+ CD38+ (24%). Patients classified as in poor HIV clinical status showed expected and well established patterns where multiple markers of immune activation were outside of normal ranges.

Conclusions

The majority of long term perinatally HIV infected individuals with controlled HIV viremia and restored CD4 cell populations have persistent and distinctive patterns of inflammation.
THE IMPACT OF PRE-CONCEPTION KNOWLEDGE OF POSITIVE HIV STATUS ON UPTAKE OF PMTCT INTERVENTIONS AND INFANT HIV FREE SURVIVAL

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Background and aims

Most HIV positive women in Kenya learn of their HIV status when tested at Ante-natal clinics. Knowledge of positive status before pregnancy allows utilization of interventions to minimize risk of mother-to-child transmission of HIV. It is unclear to what extent women who know they are HIV infected seek and utilize interventions that reduce risk of vertical HIV transmission. The aim of this study is to determine the impact of pre-conception knowledge of positive HIV status on uptake of Prevention of Mother-to-child Transmission interventions and infant HIV free survival at Naivasha District Hospital.

Methods

Retrospective cohort study targeting mother-infant pairs presenting at Naivasha District Hospital. Questionnaire administered to collect socio-demographics characteristics, timing of knowledge of maternal HIV status, uptake of PMTCT interventions and infant HIV status. Survival analysis and univariate analysis utilized to assess the relationship between pre-conception knowledge of HIV, uptake of PMTCT interventions and infant HIV free survival.

Results

One hundred and thirty three mothers were enrolled, 63 (48.8%) had knowledge of positive HIV status prior pregnancy (conception). No significant difference in uptake of PMTCT interventions between mothers with and without preconception knowledge of positive HIV status. 18 month point HIV free survival in infants of mothers with preconception knowledge of HIV status was 95% compared to 92% in infants of mothers with no knowledge of HIV status.

Conclusions

Uptake of PMTCT services and infant HIV free survival was comparable among women with and without preconception knowledge of positive HIV status, showing the urgent need for prioritisation of preconception care in Naivasha District Hospital.
TALE OF TWO SIBLINGS WITH DOUBLE TROUBLE (HIV WITH TUBERCULOSIS)
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TALE OF TWO SIBLINGS WITH DOUBLE TROUBLE

(HIV with Tuberculosis)

Two siblings, an 8 year old girl and a 6 year old boy, were diagnosed with a rare genetic bleeding disorder, Glanzmann Thrombasthenia, with repeated presentations of mucocutaneous bleeding since early infancy. Both the children were put on the standard symptomatic and supportive treatment of this inherited disorder which they required quite often. The children were transfusion and platelet concentrate dependent.

Unfortunately, repeated blood transfusions from private and general hospital led to the acquiring of HIV infection by them. PCR for viral load was strongly positive for girl: 10139463 IU/ml and for boy: 11541481 IU/ml. However screening for hepatitis B and C is negative. They also developed signs and symptoms of pulmonary tuberculosis which was evident on the chest X-ray as non-resolving pneumonic infiltrates. Antiretroviral and Anti Tuberculous therapy were started in March 2017. Additionally, the girl developed Psoas abscess and microbiology report was MRSA (methicillin resistant staphylococcus aureus) positive. Currently Viral loads are decreased and CD4+ cell status is 26%. Treatment is continuous and siblings are being monitored.
IMPLEMENTATION OF VIRAL LOAD TESTING PROGRAM AT OLA DURING CHILDREN'S HOSPITAL: ARE THE UNAIDS “90-90-90” TARGETS A REALISTIC PROSPECT FOR SIERRA LEONE'S HIV POSITIVE CHILDREN?

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Background and aims

The 2016 WHO consolidated guidelines on ART recommend viral load testing (VLT) to monitor response to antiretroviral treatment (ART). VLT was recently introduced in 3 hospitals in Sierra Leone (SL), including Ola During Children's Hospital (ODCH) where 83% of the country’s pediatric HIV population receive routine care. A sustained high HIV viral load in children can have implications on their long term treatment outcomes and options.

Methods

The national HIV/AIDS program established a mechanism for HIV VLT centred on the referral of plasma samples for HIV Viral Load analysis at a central reference laboratory. First VLT results have been received for 205 of the 350 ART enrolled children at ODCH. These results were reviewed and analyzed by the HIV treatment team at ODCH.

Results

53/205 (26%) of results received showed detectable VL. 34% (n=18) were > 5,000 copies/ml, and 53% (n=28) of the results were of children with high VL > 1,000 copies/ml as per W.H.O criteria. 71% of these children were younger than 10y of age. Median duration on ART of these children with high viral load was 5.97 years (95% CI [5.23, 6.66]).

Enhanced adherence counselling is being provided to the children and caregivers and repeat VL tests scheduled as recommended by the W.H.O.

Conclusions

Undetected poor treatment adherence and failure in pediatric HIV patients in SL prevail. Continued review and analysis of the VL results in the coming period may inform national recommendations on pediatric ART regimen optimization and adherence monitoring as SL chases the UNAIDS 90-90-90 targets.
Background and aims

Malnutrition in HIV-infected children is a major challenge despite recognized effectiveness of prevention-of-mother-to-child-transmission and nutrition services. In addition, pediatric antiretroviral therapy (ART) coverage is still limited thus gains made in infancy are lost. Within the context of a study on the role of nutrition supplementation as a determinant of immune function and pharmacological outcome among HIV infected malnourished children in Uganda, we explored the knowledge, practices and attitudes of carers of HIV-infected children towards feeding malnourished children and the use of ready to use therapeutic food (RUTF) and ART.

Methods

We conducted a qualitative study between January 2015 and March 2016 that enrolled carers of HIV-infected children accessing care from selected Pediatric HIV care centers in Kampala. Data was collected using 13 Focus Group Discussions and 16 In-depth interviews, analyzed using content thematic approach and was approved by relevant ethical bodies.

Results

The age range of participants was 18-45 years. Having a malnourished child exposed both mother and child to stigmatization and hindered a children’s ART adherence. Assessment and management for malnutrition was perceived as beneficial in HIV infected children. Most carers whose children were not malnourished expressed limited knowledge and understanding of RUTF. The carer with RUTF knowledge got it from the health facility when their children suffered malnutrition. Most study participants expressed limited knowledge and understanding of RUTF and ART in the context of malnutrition.

Conclusions

[End of Document]
There is need to strengthen nutritional and ART education among carers of HIV malnourished children.
THE SOCIAL-EPIDEMIOLOGICAL PROFILE OF HIV-POSITIVE PATIENTS INFECTED VIA MOTHER-TO-CHILD TRANSMISSION

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The pediatric ambulatory at Emílio Ribas Institute of Infectology monitors 230 mother-to-child HIV infected patients. Our aim is to describe social and epidemiological aspects of this population.

The characteristics of these patients are: 165 of them are over 18; 91 are female, and 74 are male. There is no difference in median age. 38 children under 18 are male (median age: 12.4); 36 are female (median age: 14.2). 59.4% of the patients under 18 live with their family (father, mother or relatives), and 55.1% of those over 18 live with a relative. All patients under 18 go to school. Only 12% of those over 18 are or have been undergraduate students. The majority of patients went to high school. Patients’ level of education is lower when compared to parents’ average. 58% of patients over 18 have a job; the majority earns the minimum wage. Employment rate or quality is also lower than general population.

We observed a steep fall in the number of HIV-infected young children due to mandatory HIV tests during pregnancy and chemoprophylaxis during pregnancy and postnatal period. The high number of patients over 18 years of age in our ambulatory reflects the difficulty in transitioning to adult ambulatory. Low college education rates may be one factor that makes them professionally less competitive; many factors may be involved in the patients’ low education levels.

We believe a better social support in addition to wide access to antiretroviral drugs can contribute to improve these patients’ lives in the future.
At present there are over 30 antiretroviral drugs available in Brazil. Their distribution is wide and free of charge. The initial regimen for pediatric population consists of 2 nucleoside analogues and a protease inhibitor or a non-nucleoside analogue. This study assesses the therapeutic response of patients infected via mother-to-child transmission monitored at the Emílio Ribas Institute of Infectology.

Among the patients, 165 are over 18 years-old, and 80% take the two-class regimen. Undetectable viral load was observed in 68% of them. The majority of patients with detectable viral load experience difficulties or irregular compliance. Among 20% of youth taking more than two classes of antiretroviral drugs (nucleoside analogue, protease inhibitor, and integrase inhibitor), only 61% showed an undetectable viral load. 73 patients under 18 take antiretroviral drugs, among which 69 take two classes, and 90% of these show undetectable viral load. Only 4 patients take more than two classes, and 2 of them have an undetectable viral load.

Treatment efficacy involves several factors: medication taste, number of pills and pill size, frequency, and emotional support. In this study, over 90% of patients under 18 showed excellent therapeutic response while taking two classes of antiretroviral drugs. Efficacy drops to 68% when the same treatment is evaluated in patients over 18. This drop may be related to change in behavior due to age or social environment.

We believe that reinforcing observation while transitioning the patient from adolescence to young adulthood and offering strong multidisciplinary support can contribute to improve adherence to treatment.
WHY DO WE STILL HAVE CHILDREN WITH HIV INFECTION DUE TO MOTHER-TO-CHILD TRANSMISSION – THE PORTUGUESE EXPERIENCE IN THE LAST 10 YEARS

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Background and aims

Rates of mother to child HIV transmission (MTCT) in Portugal dropped to less than 2% over the last 10 years. The aim of this study is to analyse the reasons in which MCTC occurred and the factors that favored its occurrence.

Methods

National observational study of all the HIV-positive infants born from HIV-infected women, between 2007 and 2016. Analysis of demographic and pregnancy characteristics, antiretroviral therapy (ART), neonatal prophylaxis and time of diagnosis.

Results

Thirty-nine infants were infected from 2396 mother-infant pairs. Mothers’s nationality was: 51% Portuguese, 49% immigrants (89.5% Africans). HIV diagnosis: before pregnancy 33.3%, during pregnancy 36%, at delivery or postnatal 30.7%. There was insufficient pregnancy surveillance in 66.7% (100% in injection-drug-users). Mothers had no antenatal or intrapartum antiretroviral prophylaxis in 25.6%, 25% despite ART were not supressed and 41% had only intrapartum prophylaxis. 73.4% had maternal viral load (VL) at delivery over 10000 but only 59% had an elective caesarean-section delivery and 48.7% of the neonates did triple prophylaxis. The infant diagnosis was made by DNA/RNA polymerase-chain-reaction in the first 48h in 51.3%, 1-3 months 38.5%, 4-5 months 2.5%, ≥6 months 3 (breastfed).

Conclusions

Full compliance with national recommendations for the prevention of HIV MTCT was not observed in any cases in which MTCT occured. In some cases healthcare facilities couldn’t apply the delivery and post-delivery prevention measures. A more active intervention in injection-drug-users and immigrant women with the goal of earlier HIV-diagnosis and achievement of total adherence to pregnancy surveillance and ART is needed for the elimination of MTCT.
PREVALENCE OF MALARIA IN PAEDIATRIC HIV PATIENTS AS SEEN AT THE NATIONAL HOSPITAL, ABUJA- NIGERIA

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Background and aims

Background: Malaria and HIV account for significant morbidity and mortality in childhood in the sub-Saharan Africa.

Aim: to determine the prevalence of malaria parasitemia in HIV infected children and determine any associated factors.

Methods

Method: a prospective descriptive study on HIV seropositive patients attending the paediatrics HIV treatment clinic of the National Hospital Abuja- Nigeria. Subjects were age and sex matched; excluded were those on antimalaria chemoprophylaxis in the previous 2 weeks. Biodata and other relevant information were obtained, including Hb/PCV, MPs and CD4 count estimation. Consent and ethical approval were obtained.

Results

Result: 120 HIV seropositive pediatric patients and 120 age sex matched control were recruited over a six months, July –December 2016; mean age (±SD) 10.12 (±3. 89) years. 90 (75%) of HIV subjects and 80(66.7%) non HIV had BMI < 18.5 (p 0.005); 56 (46.7%) HIV subjects had WHO stages 3 and 4; 38 (31.7%) had CD4 count <500cells/ml. 50 (41.7%) HIV and 88 (73.3%) non HIV owned an insecticide treated net (ITN), (p 0.000), 35(29.2%) HIV and 36(30%) used the ITN, (p 0.88). Of those HIV that used the ITN, 16(45.7%) and among the non HIV that used ITN 10(28.6) had positive parasitaemia.

Conclusions

Conclusion: the usage of ITN would offer added protection to HIV subjects to lessen effects from malaria infections.

Key words: HIV, Malaria parasitemia, Insecticide treated nets, morbidity.
EFFECTS OF CO-ADMINISTRATION WITH CHRYSEN AND NARINGENIN ON THE PHARMACOKINETIC OF SAQUINAVIR IN RATS

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Background and aims

The objective of this study was to assess the impact of chrysin and naringenin on the pharmacokinetic (PK) of saquinavir (SQV), a substrate of P-glycoprotein (P-gp), in rats.

Methods

Fifteen rats were randomized into 3 groups of equal size, and administered orally 30 mg/kg SQV with or without 40 mg/kg chrysin or naringenin. The PK of SQV was assessed using non-compartmental analysis and the plasma concentrations of three groups were determined by LC-MS/MS.

Results

The PK parameters values of SQV, SQV+ naringenin, SQV+ chrysin are as follows:882.91 ng∙h∙mL⁻¹, 861.32 ng∙h∙mL⁻¹, 934.84 ng∙h∙mL⁻¹; 903.97 ng∙h∙mL⁻¹, 865.90 ng∙h∙mL⁻¹, 947.92 ng∙h∙mL⁻¹; Cmax, 177.72 ng·mL⁻¹, 89.8 ng·mL⁻¹, 130.72 ng·mL⁻¹; Tmax, 1 h, 2 h, 0.5 h; t1/2, 11.73 h, 12.61 h, 13.33 h; 27.09 h, 31.63 h, 26.60 h; CL/F, 21.65 mL·kg⁻¹·h⁻¹, 21.45 mL·kg⁻¹·h⁻¹, 20.62 mL·kg⁻¹·h⁻¹.

Conclusions

Double peak phenomenon was observed in the plasma SQV profiles. Our study demonstrates that chrysin and naringenin can not significantly affect SQV PK profiles in rats.
EFFECTS OF CO-ADMINISTRATION WITH MORIN AND ACETYL-RESVERATROL ON PHARMACOKINETICS OF SAQUINAVIR IN RATS

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Background and aims

The objective of this study was to assess the impact of morin and acetyl-resveratrol on the oral bioavailability and pharmacokinetics of saquinavir (SQV), a substrate of P-glycoprotein (P-gp), in rats.

Methods

Twenty rats were randomized into 4 groups of equal size including a control group, 2 intervention groups and a positive control group, and administered orally 30 mg·kg⁻¹ SQV with or without 40 mg·kg⁻¹ morin or acetyl-resveratrol or verapamil (as positive control). The plasma concentrations of saquinavir were determined using a high-performance liquid chromatography-tandem mass spectrometry (HPLC-MS/MS) method and the PK of SQV was assessed using non-compartmental analysis.

Results

The PK parameters values of SQV, SQV + morin, SQV + acetyl-resveratrol, SQV + verapamil are as follows: AUC₀⁻ᵗ, 381.53 ng·h·mL⁻¹, 185.53 ng·h·mL⁻¹, 360.43 ng·h·mL⁻¹, 529.95 ng·h·mL⁻¹; AUC₀⁻∞, 409.48 ng·h·mL⁻¹, 228.52 ng·h·mL⁻¹, 446.67 ng·h·mL⁻¹, 552.41 ng·h·mL⁻¹; Cₘₚₙₜ, 110.80 ng·mL⁻¹, 86.44 ng·mL⁻¹, 139.84 ng·mL⁻¹, 423.60 ng·mL⁻¹; Tₘₚₙₜ, 0.25 h, 0.25 h, 0.25 h, 0.50 h; t½, 5.72 h, 5.94 h, 6.78 h, 3.78 h; MRT₀⁻∞, 10.30 h, 9.61 h, 12.30 h, 4.89 h; CL/F, 7.59 mL·kg⁻¹·h⁻¹, 13.88 mL·kg⁻¹·h⁻¹, 7.28 mL·kg⁻¹·h⁻¹, 5.52 mL·kg⁻¹·h⁻¹.

Conclusions

Multiple peak phenomenon was observed in the plasma SQV profiles. Our study demonstrates that morin can significantly reduce the SQV oral bioavailability and affect SQV PK profiles while acetyl-resveratrol cannot significantly affect the SQV oral bioavailability and SQV PK profiles in rats.
EFFECT ANALYSIS OF BLOCKING MOTHER TO CHILD TRANSMISSION IN 125 INFANTS OF MATERNAL HIV INFECTION

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Background and aims

Understanding of the implementation and effect of blocking mother to child transmission in HIV infection.

Methods

To retrospective study 125 infants of maternal HIV infection in 2010~2015 years of Shanghai public health clinical center, including pregnancy antiviral therapy, delivery mode, feeding patterns, HIV infection in infants.

Results

At final, two infants are infected with HIV in 125 cases. HIV infection rates in infants of no pregnancy antiviral therapy, vaginal delivery, breast feeding are 25%, 20%, 25%, is significantly higher than the infants of pregnancy antiviral therapy, cesarean delivery, artificial feeding(\(P<0.01\)).

Conclusions

Through the pregnancy antiviral therapy, intrapartum obstetric intervention, artificial feeding, can effectively block HIV mother to child transmission. Blocking mother to child transmission is an important way to reduce HIV infection in infants, and has great social benefit and economic benefit.
IMUNOGENICITY OF THE HEPATITIS B VACCINE IN PATIENTS WHO RECEIVED HAEMATOPOIETIC STEM CELL TRANSPLANTATION

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Background and aims

The recommendations of immunization against hepatitis B in patients after hematopoietic stem cell transplantation (HSCT) are various and not universal. Therefore, we’ve compared the response of the Recombinant Hepatitis B Vaccine (rHBV) given at different posology in post-HSCT patients referenced to our Immunization Center.

Methods

We’ve performed a prospective study of patients with HSCT from January 2012 to December 2015. An initial serological profile was performed at day 0 of vaccination, then 30-60 days after receiving each of the three (0-1-6 months) or four (0-1-6-8 to 12 months) rHBV schedule. Seroconversion was defined as anti-HBs>10 mIU/mL. In accordance with the Brazilian Nacional Immunization Program, rHBV was given as double-volume dose. Ethical approvals were obtained.

Results

a total of 126 patients received 3 or 4 shots of rHBV, of which 77 (66,1%) were included; fifty-two percent were male and the average age was 52 years. Multiple myeloma was the most common underlying disease (54.5%) and 91% of the patients undergone autologous transplant. Overall, seroconversion rate after any three or four double-dose rHBV shots was 57% (44/77); however, rates were significantly higher in patients receiving four shots (73%; 17/23) than three shots (50%; 27/54). No associations between rHBV seroconversion and age, underlying disease, or the moment of first shot were detected.

Conclusions

seroconversion rates were significantly higher after four rHBV shots, sustaining the 4-doses schedule recommended after HSCT.
Background and aims

Vaccination is the most effective method for prevention of invasive pneumococcal diseases (IPDs). Nevertheless, prevention through vaccination has some challenges. Thus, surveillance studies are critical for a successful vaccination policy and it is important for each country to know and monitor their own regional pneumococcal serotype distribution. In order to monitor serotype distribution of pneumococci that cause IPD in children, we have been carrying out a prospective, hospital-based multicenter, epidemiological surveillance study since 2008. Herein, we aimed to present 2015-2016 data of our surveillance study.

Methods

*Streptococcus pneumoniae* (S. pneumonia) strains, which were isolated during routine clinical diagnostic practice from the patients aged 0-18 years treated for invasive pneumococcal infection, were included. Duplicate isolates from the same patient were not accepted. Serotyping was performed by the Quellung reaction.

Results
This study included 77 *S. pneumoniae* strains from 19 centers. The mean age of the patients (47 boys and 30 girls) was 4.97±4.85 years. The most common diagnosis was bacteremia/sepsis (50.7%), followed by meningitis (39.7%), pneumonia (5.5%). The most frequently isolated serotype was 19F, followed by 1 and 3. The coverage rate of 13-valent pneumococcal conjugate vaccine (PCV-13) in children was 58.4%; this rate was 68.8% in the 0-5 year age group and 41.4% in the 6-18 year age group. Vaccine coverage rates of PCV-7, PCV-10, and PCV-13 are shown in Figure 1.

![Bar chart showing vaccine coverage rates for PCV-7, PCV-10, and PCV-13 in different age groups.](image)

Figure 1. Coverage rates of 7-valent pneumococcal conjugate vaccine (PCV-7), 10-valent PCV-10, 13-valent PCV-13 in children.

**Conclusions**

Conducting the surveillance studies precisely is important in monitoring the outcomes of immunization practices.
Using Nasopharyngeal Carriage Surveillance in Children Hospitalised with Acute Respiratory Infection to Determine the Pneumococcal Conjugate Vaccine Coverage Required for Indirect Immunity

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Background and aims

Pneumococcal conjugate vaccines (PCVs) prevent disease through both direct protection of vaccinated individuals, and indirect protection of unvaccinated individuals through reduction of nasopharyngeal (NP) carriage and transmission of vaccine-type pneumococci. While the indirect effects of PCV vaccination are well described, the PCV coverage required to achieve the indirect effects is unknown. We will determine this using hospital-based NP pneumococcal carriage surveillance at three sites in the Asia-Pacific region.

Methods

Surveillance includes children aged 2-59 months admitted to participating hospitals at three sites with acute respiratory tract infection. Thirteen-valent PCV (PCV13) status is obtained from written records. An NP swab is collected according to standard methods and examined by lytA qPCR, with positives serotyped by microarray. PCV13 coverage is determined using administrative data or community survey.

Results

In Lao PDR, Papua New Guinea, and Mongolia, we have recruited 1078, 389, and 396 children, respectively. For each site, we will present monthly PCV13 carriage rates. In Lao PDR, where PCV13 coverage is <60%, PCV13 carriage rates are declining among vaccinated children (direct effects) but not unvaccinated children (indirect effects). Data will also be pooled across sites to examine relationships between PCV13 coverage and carriage.

Conclusions
As PCV13 coverage increases, we hypothesise that PCV13 carriage will decline in vaccinated and unvaccinated individuals. These results will inform vaccine policy makers about the PCV coverage required to maximise the effects of PCV.
A MODELLING STUDY TO EVALUATE THE SUFFICIENCY OF CURRENT VACCINATION STRATEGY FOR MEASLES CONTROL IN HUBEI, CHINA

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Background and aims

The routine immunization coupled with supplementary immunization activities (SIA) is the current strategy for measles control in China. Such measures achieved a great success in the reductions of measles cases in the past. However, China is now facing multiple challenges due to the upward shifting of infection ages and immunity gap in infants. We aim to study whether the current strategy will be sufficient or not in the future.

Methods

This is a mathematical modelling study adapting Hubei, a high risk province in central China as the setting. An age-stratified Susceptible-Exposed-Infectious-Recovered model was developed to depict the measles transmission. Population was divided into 7 age groups studying the effects from population growth, initial susceptibility, maternal immunity, and waning immunity. The model was calibrated using the age-stratified incidence data from 2012 to 2015.

Results

In the long run, SIA targeting to the adult group is the more effective and it can reduce around 20% to 40% of annual cases in 2025. Nevertheless, given the current strategy, the measles epidemics could not be well-controlled (i.e. >10/100,000 annually) as the epidemics are dominated by infant infections who have not yet received the first dose of MMR or are not eligible to be covered by SIA either.

Conclusions

Control measures for children cases who are too young to vaccine should be improved and when necessary, an earlier MCV should be considered in China. With an adaption of two-child policy, an early planning for potential rise of cases is required.
DETERMINANTS OF POOR RESPONSE TO ORAL POLIO VACCINE IN GAMBIAN INFANTS: IMPLICATIONS OF INFANT AND MATERNAL CYTOKINE PROFILES

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Background and aims

Oral polio vaccine (OPV) is consistently shown to be less efficacious when trialled in ‘low-income’ countries, such as The Gambia, than in high-income countries. One proposed cause of this disparity is that infants in low-income countries mount a different immune response to OPV due to exposure to more enteric pathogens during early-life. Enteric viral infections and associated anti-viral cytokine profiles have been found to be important predictors of failure to seroconvert in response to OPV in India. Our work aims to investigate whether inflammatory infant cytokine profiles at the time of OPV administration, are associated with poor vaccine response in The Gambia. The association of cytokines in breast milk, consumed by infants around the time of vaccination, with vaccine response will also be investigated.

Methods

Infant blood and breast milk samples were taken just before administration of OPV, from a cohort of 100 Gambian infants and their mothers. Cytokine levels and anti-polio IgG levels were measured using Enzyme-Linked Immunosorbent Assays (ELISAs).

Results

Preliminary analysis has shown that at the time of OPV administration, serum levels of Interferon-gamma (IFN-γ) and Tumour Necrosis Factor-alpha (TNF-α) were generally higher in those infants who did not show an IgG response to vaccination, though this was not statistically significant. Further analysis is underway for completion in August 2017.

Conclusions

It is hoped that greater understanding of the association of the infant cytokine profile at the time of vaccination with OPV response will provide insight into the mechanisms behind poor OPV immunogenicity and efficacy in The Gambia.
THE EFFECT OF VITAMIN A ON MEASLES VACCINE: A META-ANALYSIS
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With the local outbreak of measles, thus how to improve the effectiveness of measles vaccine draw extensive concerns. WHO recommends vitamin A supplementation at vaccination, which is doubtful. We aim to evaluate the effect of vitamin A on measles vaccine, which would provide introductive suggestions for further theory research and application work.
Background and aims

Household survey is an essential tool for vaccine coverage monitoring in developing countries. However, the information biases of survey-based vaccine coverage estimates are usually inevitable and unmeasurable, primarily due to inaccuracies in recall, low retention of home-based health records (HBR, i.e. vaccination cards), and poor design and recording of immunization history onto HBRs. This study presents an innovative method using nested serological immune marker assessments to validate and adjust vaccination coverage survey results.

Methods

We enrolled children 12-23 months of age in vaccine coverage surveys in Karachi, Pakistan from January to December 2016. Vaccination history was collected through both verbal recall by caregiver and HBR, when available. One-third of survey participants were randomized for capillary blood collection. Serum specimens were tested for anti-measles IgG antibody (Enzygonost ELISA, Siemens, Germany). Bayesian latent class models were developed to evaluate the misalignment among recall of measles vaccination history, HBRs, and the immune marker assessments.

Results

Measles vaccine coverage, defined by positive recall or HBR documentation, was 72.9% (95% CI: 71.3, 74.4) among all 3,247 survey participants. 1,739 (54%) valid HBRs were retained. Among 847 participants with anti-measles IgG measured, 342 (40%) were positive and 146 (17%) were equivocal. The adjusted measles vaccine coverage was 62.1% (95% CI: 55.1, 69.4) among all survey participants.

Conclusions

Standard survey methods can overestimate vaccine coverage by being based on verbal recall or availability of HBR. We propose addressing such biases through addition of a serological component and analysis with latent class statistics.
Background and aims

Native American infants have high rates of pneumococcal disease. Pneumococcal protein-based vaccines may provide serotype-independent protection. We present immunogenicity and safety of an investigational pneumococcal protein-based vaccine containing pneumolysin toxoid (dPly) and histidine-triad protein D (PhtD).

Methods

In this phase 2, double-blind, controlled trial (NCT01545375), 6-12 week-old Native American infants randomized 1:1, received either dPly/PhtD vaccine (N=900) or placebo (N=903) at ages 2, 4, 6 and 12-15 months, co-administered with PCV13. Immunogenicity and adverse events (AEs) were assessed in a sub-cohort (N=400); serious AEs (SAEs) were assessed in all.

Results

In the according-to-protocol immunogenicity cohort (N=124/group), all children had anti-Ply and anti-PhtD antibody concentrations ≥ assay cut-offs (12 and 17 EL.U/mL, respectively) at all timepoints. Antibody geometric mean concentrations for both antigens were higher in the Investigational group than Controls 1 month post-primary/booster vaccination and increased after primary/booster vs pre-vaccination (Table 1). Table 2 shows AEs. SAEs were reported from 229/900 (25.4%; Investigational) and 232/903 (25.7%; Control) children. Vaccination-related SAEs were reported from 3 children (2 Investigational, 1 Control). No fatal SAEs were reported.
Conclusions

dPly/PhtD vaccine was immunogenic and had an acceptable reactogenicity profile after primary/booster vaccination in infants.

Funding: GlaxoSmithKline Biologicals SA
NASOPHARYNGEAL CARRIAGE AFTER IMMUNIZATION WITH AN INVESTIGATIONAL PNEUMOCOCCAL PROTEIN-BASED VACCINE CO-ADMINISTERED WITH PCV13: A PHASE 2 RANDOMIZED CLINICAL TRIAL IN NATIVE AMERICAN INFANTS

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Background and aims

Native Americans have high rates of pneumococcal disease despite use of pneumococcal conjugate vaccines (PCVs). To extend protection beyond current vaccine types, pneumococcal protein vaccines are being studied. We assessed the incremental efficacy (over 13-valent PCV [PCV13]) of an investigational pneumococcal protein-based vaccine, containing pneumolysin toxoid (dPly, 10 micrograms) and histidine-triad protein D (PhtD, 10 micrograms), against pneumococcal NPC in Native American infants.

Methods

In this phase 2, double-blind, controlled trial (NCT01545375), 6-12 week-old infants, randomized 1:1, received either dPly/PhtD vaccine adsorbed on AlPO₄ (Investigational group, N=900) or AlPO₄ placebo (Control group, N=903) at ages 2, 4, 6 and 12-15 months, each co-administered with PCV13. Nasopharyngeal swabs were taken from a sub-cohort (Investigational group, N=399; Control group, N=401) at five time points to assess prevalence, acquisition and clearance of pneumococcal colonization. Vaccine efficacy was estimated as (1-relative risk) x 100.

Results

The prevalence of any pneumococci and non-PCV13 type pneumococci in nasopharyngeal swabs did not significantly differ by treatment group at any time point. Observed efficacy point estimates against NPC prevalence were positive at all time points, however 95% confidence intervals spanned zero (Table). Acquisition and clearance did not differ by treatment group.
Conclusions

No statistically significant incremental efficacy of the investigational dPly/PhtD vaccine over PCV13 was seen against NPC prevalence, acquisition or clearance of pneumococcus in Native American infants.

Funding: GlaxoSmithKline Biologicals SA
TRENDS IN PNEUMOCOCCAL MENINGITIS AND RELATED IMMUNIZATION RESEARCH IN SOUTH AMERICA BY A HISTORICAL REVIEW AND BIBLIOMETRIC ANALYSIS FROM 2005 TO 2015

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Background and aims

It is necessary to know the scope of the published articles on pneumococcal meningitis and pneumococcal vaccine research in Latin America and its evolution in the time taking into account the beginning of the immunization campaigns, these trends reveal the amount of interest displayed by the scientific community in our region. Our objective was to evaluate the scientific production in Latin American countries regarding pneumococcal meningitis and vaccination in the period between 2005-2015.

Methods

We used bibliometric analysis in the Scopus database, with the specific terms: "pneumococcal vaccines", "immunization programs", and "meningitis" looking for the scientific articles in Latin America, we also through descriptive analysis, determined quantity and scope of the articles per country, year and authors.

Results

At Scopus there are overall worldwide 2000 articles. There was a remarkable increasing in publication since 2010. Brazil has 50, Argentina 10 articles, Latin America overall has 80. Comparing with the studies coming from United States the production is scarce; USA has 400 articles of the world production. The most frequent author was Van der Ende. In South America the most frequent authors were Varon and Halperin.
Conclusions

There was a slowly increasing number of publications in the area in recent years after the spread of immunization campaigns in early childhood. Latin America produced around 4% of publications on these topics by now. These studies need to be promoted more in the academic field in our countries since the epidemiological changes after the vaccination campaigns
Forgotten immunization appointment is a factor associated with low immunization uptake in Nigeria that could be addressed by a reminder-based intervention. However, the intervention has to be acceptable by mothers to be effective. The study was conducted to identify determinants of mothers’ willingness to receive phone call or text message reminders for immunization appointments in Ilorin, North-Central Nigeria.
Background and aims

The first dengue vaccine (DV) was licensed in Thailand in October 2016. DV acceptability amongst pediatricians is unknown. This study aims to determine DV acceptability and to assess the effect of a DV-educational intervention amongst Thai pediatricians.

Methods

A 14-item, self-completion questionnaire of DV-prescribing experience and opinions about dengue infection and DV was developed and administered to pediatricians attending two scientific meetings between April and May 2017. It was administered pre- and post-DV educational session.

Results

Of 360 respondents, 166 (46%) were public sector pediatricians, and 92 (26%) pediatricians had ever prescribed DV with 64/92 (70%) in the private sector. Most pediatricians considered dengue infection was a serious health burden. About prescribing DV, the most important enabling factors were disease awareness (44%) and vaccine efficacy (35%), and the most important barriers were vaccine cost (39%) and vaccine safety concerns (29%). DV prescribers were less concerned about the antibody-dependent enhancement (ADE) safety issue than non DV prescribers (17% vs 40%, p<0.001). Comparison of opinions pre- and post-DV educational session showed significantly increased confidence in vaccine efficacy (58% vs 89%), its ability to reduce hospitalization (78% vs 97%) and disease severity (89% vs 98%) and showed significantly reduced ADE safety issue concerns (32% vs 3%) (all p<0.001).

Conclusions

Despite high awareness amongst pediatricians of dengue disease burden, just over one-quarter have ever prescribed DV during the first 6-month post-licensure in Thailand. Barriers to prescribing DV included vaccine cost and safety concerns. Education could improve DV acceptability amongst pediatricians.
Background:
Diphtheria remains a health problem in the world. East Java experienced the outbreaks of about 3000 diphtheria cases since 2011-2015. A carrier that is a one of source of infection has a role of this. There were only few comparison studies about risk factor differences between pediatric patients and carriers.

Aim:
To analyze the difference of risk factors for pediatric diphtheria patients and carriers in East Java, Indonesia since 2011 to 2015.

Methods:
We conducted an observational case-control study. Data were retrieved from East Java Provincial Health Office and Balai Besar Laboratorium Kesehatan Surabaya from 2011-2015. We compared and analyzed the personal hygiene and the environment of patients and carriers aged 1 – 18 years old with positive throat swab culture of toxigenic strains of Corynebacterium diphtheria.

Results:
There were 34 carriers and 147 diphtheria patients in this study. We collected data by interview and observed to patients and carriers environment directly. Most of them, both patients and carriers located in Madura island and horseshoe area. There was a significant difference between diphtheria patients and carrier personal hygiene and environment. The feasibility of bathroom and toilet was significantly different between patients and carriers with OR = 4.626 ( CI: 1.75 – 12.24 ) when using shared bathroom and toilets and OR = 5.5 ( CI: 1.84 – 15.43 ) if they don’t have at all.

Conclusion:
Diphtheria patients and carriers have location in Madura Island and horseshoe area. There is a significant difference between diphtheria patients and carriers personal hygiene.
RISK OF VACCINATION IN CHILDREN WITH EPILEPSY

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Background and aims

Several disorders have been attributed to whole cell diphtheria tetanus pertussis (wDTP), acellular acDTP, measles-mumps-rubella (MMR), and oral polio (OPV) vaccination.

The aim of the study was to present relation between these vaccinations and the risk of a subsequent seizures, and neurodevelopmental disability in children with previously diagnosed epilepsy.

Methods

634 children 12 to 38 months of age, with previously diagnosed symptomatic or idiopathic epilepsy without progressive encephalopathy have been vaccinated in period from 1995 to 2015th year in Child and youth health care Institute of Vojvodina.

Results

Three potentially serious adverse reactions caused by vaccination have been described, which is less than excepted in healthy population. Febrile seizures in 13 months aged girl after MMR. One episode of transit hypotonia and vomiting after wDTP and OPV vaccination in 8 months aged boy. One episode of fever, vomiting and prolonged cry after wDTP, OPV vaccination.

Conclusions

We conclude in children with epilepsy risk of vaccination is not higher than in healthy population.

It should not be forgotten that 'benign infective childhood diseases' can, and do, kill, and that vaccines are a public health intervention saving many millions of lives around the world. For each child, the risks of the disease, must be compared with the vaccine's protective efficacy and potential adverse reactions. Vaccination is given preference in nearly all children with epilepsy.
SEROTYPE DISTRIBUTION OF PNEUMOCOCCI ISOLATED FROM INVASIVE INFECTIONS AFTER INTRODUCTION OF EXTENDED-VALENCY PNEUMOCOCCAL CONJUGATE VACCINES (PCV) INTO NATIONAL IMMUNIZATION PROGRAM IN KOREAN CHILDREN


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Background and aims

This study aimed to evaluate the importance of pneumococcus in invasive bacterial infections, and to analyze the serotypes of pneumococci isolated from invasive infections among children after introduction of PCV10 and PCV13 into national immunization program in 2014.

Methods

This is a retrospective study of children under 18 years of age who were diagnosed as invasive bacterial infections at 26 tertiary hospitals located throughout the Republic of Korea from September 2013 to December 2015. Pneumococcal isolates from patients with invasive pneumococcal disease were collected prospectively from January 2014 to March 2016. Serotypes of pneumococci were determined by Quellung reaction, polymerase chain reaction with serotype-specific primers, or sequencing of cps genes.

Results

A total of 545 cases of invasive bacterial infections among immunocompetent children were identified and 75 cases (13.8%) were caused by pneumococcus. Pneumococcus was most common pathogen in the 3-23 month group (36.3%) and the 24-59 month group (51.1%). A total of 55 isolates were available for serotyping. Most common serotypes were 10A (9 isolate), 12F/A (7 isolate), 15A (5 isolate), and 19A (5 isolate). Two isolates (4.7%) were PCV7 serotypes, one isolate (2.3%) was serotype added in PCV10, and six isolates (14.0%) were in PCV13-specific serotypes. Overall, 79.1% (34 isolates) were nonvaccine serotypes.

Conclusions
Pneumococcus was the most common cause of invasive bacterial infections among children aged 3-59 months. The percentage of vaccine serotypes causing invasive pneumococcal diseases was decreasing.

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ABSENCE OF IGG AGAINST PERTUSSIS TOXIN IN CHINESE NEWBORNS

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Background and aims

To investigate the level of pertussis-related antibodies in newborns.

Methods

A total of 112 serum samples from newborns were collected in 2016-2017 in Beijing. Anti-pertussis toxin (PT) IgG concentration was measured by ELISA (Euroimmun, Lübeck, Germany) using purified PT as a coating antigen.

Results

The anti-PT IgG could not be detected in 66.07% (74/112) of newborns. Even with detectable anti-PT antibodies, the majority of newborns 73.68% (28/38) had antibody level of 5-<20 IU/ml, and 7.89% (3/38) of newborns in the range from 20-<40 IU/ml. The 75% percentiles for anti-PT IgG of newborns was 5.76 IU/ml, respectively. The unprotected individuals as defined by anti-PT IgG <40 IU/mL were indentified in 93.75% (105/112) of the tested newborns.

Conclusions

The newborns were generally lack of protective antibody and vulnerable to pertussis in Beijing, China. A booster vaccination to women of child-bearing age or to pregnant women should be consider for protecting young infants who are too young to start pertussis vaccination.
SEROPREVALENCE OF MATERNAL AND CORD ANTIBODIES SPECIFIC FOR DIPHTHERIA, TETANUS, PERTUSSIS, MEASLES, MUMPS AND RUBELLA IN BEIJING, CHINA

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Background and aims

Maternal antibodies contribute to the protection of young infants from infectious diseases during the first months of life. Therefore, here we investigated the level of protective immunity against vaccine preventable diseases in pregnant women and newborns in China.

Methods

One hundred and ninety-four paired maternal and cord blood samples were collected in Beijing. Antibodies specific for tetanus, diphtheria, pertussis toxin, pertactin, measles, mumps and rubella were determined by ELISA.

Results

The 75\% percentiles for concentrations of anti-diphtheria, anti-tetanus, anti-pertussis toxin, anti-pertactin, anti-measles, anti-mumps and anti-rubella in maternal/cord sera were 0.25/0.23 (IU/ml), 0.15/0.12 (IU/ml), 18.79/20.29 (IU/ml), 681.72/747.10 (IU/l), 56.08/58.44 (RU/ml) and 43.58/40.36 (IU/ml), respectively. A total of 55.7\% (95\% CI: 48.6%-62.5%)/61.3\% (95\% CI: 54.3%-67.9\%), 71.1\% (95\% CI: 66.4%-77.1%)/73.2\% (95\% CI: 66.6%-78.9\%), 96.4\% (95\% CI: 92.7%-98.2\%)/97.4\% (95\% CI: 94.1%-98.9\%), 29.9\% (95\% CI: 23.9%-36.7%)/30.4\% (95\% CI: 24.4%-37.2\%), 67.0\% (95\% CI: 60.1%-73.2\%)/65.5\% (95\% CI: 58.5%-71.8\%) and 15.5\% (95\% CI: 11.1%-21.2\%)/17.0\% (95\% CI: 12.4%-22.9\%)of mothers and newborns had no protection against diphtheria, tetanus, pertussis, measles, mumps and rubella, respectively. Only 2.06%/1.0\% and 21.6%/23.7\% of mothers and newborns had protection against for all three components of DTP and MMR.

Conclusions

The results showed that most of the mother and newborns were susceptive to diphtheria, tetanus, pertussis and mumps, almost one-third of this population had no immune protection against measles, and about one-sixth of them were under threat of rubella infection. These data supported the immunization program for women at child-bearing age against for DTP and MMR vaccines.
Background and aims: The Global Meningococcal Initiative (GMI) was established in 2009 with a goal to prevent meningococcal disease worldwide through education, research, and cooperation. Seven global and regional GMI roundtable meetings have been held since its inception, leading to research and publications, including global and regional recommendations for meningococcal disease. The aim of this meeting was to gain a better understanding of meningococcal disease in China.

Methods: The GMI roundtable meeting for China was held in Chengdu, China in June 2017.

Results: Key findings were that between in 1938 and 1977, five epidemics of serogroup A disease occurred in China including an important epidemic in 1967. Serogroup A disease significantly declined from the 1980s when serogroup A polysaccharide vaccination was introduced into the EPI schedule. Sentinel surveillance provides an overview of trends and prevalence of different serogroups informing vaccination and planning. Surveillance data have shown the emergence of a novel serogroup C clonal complex (cc) 4821 in 2003 and in 2015, capsular switching to serogroup B. The international global emergence of serogroup W cc11 has now occurred in China. The importance of carriage and herd protection for controlling meningococcal disease were also highlighted with the view to introduce conjugate vaccination into the national immunization schedule.

Conclusions: Meningococcal epidemiology is changing in China with emergence of new clones of serogroup B and C and the international spread of the of serogroup W cc11. New strategies of vaccination may be required including the use of conjugate and serogroup B vaccination.
Background and aims

The evolving primary infant vaccination schedules implemented across Asia now involve several combinations of monovalent Hepatitis B (HBV) and DTPa-based combination vaccines. These schedules may result in 4 or even 5 doses of HBV being received by infants as part of their infancy vaccination series (primary + toddler booster).

Methods

We conducted a review of GSK clinical studies in which 4 or more doses of HBV (in combination or standalone) were given. We aimed to provide an overview of immunogenicity and tolerability experience with HBV (Engerix-B, GSK), DTPa-IPV/Hib (Infanrix IPV Hib, GSK) and DTPa-HBV-IPV/Hib (Infanrix hexa, GSK) vaccines in Asian infants supporting the transition from separate monovalent HBV vaccination to full integration of vaccinating schedule with DTPa-HBV-IPV/Hib vaccine.

Results

In 5 studies conducted in 4 countries, HBV seroprotection rates in infants administered with DTPa-HBV-IPV/Hib or DTPa-IPV/Hib and standalone HBV were within the same range when a birth dose is included in the schedule (Table 1). The reactogenicity across studies was in the clinically acceptable
### Table 1: Hepatitis B Antibody Seroprotection (Anti-HBs) and Geometric Mean Antibody Concentrations/Titers 1 month after Primary and Booster Vaccination (ATP cohort for primary and booster immunogenicity)

<table>
<thead>
<tr>
<th>Countries</th>
<th>Immunisation schedule</th>
<th>1 month after Primary Vaccination</th>
<th>1 month after Booster Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Anti-HBs ≥ 10 mIU/mL Seroprotection rates (95% CI)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(95% CI)</td>
<td></td>
</tr>
<tr>
<td>The Philippines</td>
<td>Birth dose: HBV/Primary schedule: - DTPa-HBV/IPV/Hib at 6, 10 and 14 weeks Booster - DTPa-HBV/IPV/Hib at 12-15 months</td>
<td>135</td>
<td>96.6% (94.8%-99.6%)</td>
</tr>
<tr>
<td>Singapore</td>
<td>Birth dose: HBV/Primary schedule: - DTPa-HBV/IPV/Hib vaccine at 1, 3 and 5 months</td>
<td>65</td>
<td>100.0% (94.4%-100.0%)</td>
</tr>
<tr>
<td>India</td>
<td>Birth dose: HBV/Primary schedule: - DTPa-HBV/IPV/Hib vaccine at 6, 10 and 14 weeks</td>
<td>101</td>
<td>100.0% (96.4%-100.0%)</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Birth dose: HBV/Primary schedule: - DTPa-HBV/IPV/Hib vaccine at 1, 3, 5 and 6 months - HBV at 1.5 and 5 months Booster: - DTPa-IPV/Hib at 15-18 months - HBV at 15-18 months</td>
<td>62</td>
<td>95.1% (88.3%-99.0%)</td>
</tr>
</tbody>
</table>


**Las wireless SK, et al. Hum Vaccin Immunother 2017;13:1:120-7.**


**ATP = according to protocol; N = total number of vaccines in ATP cohort; 95% CI = 95% confidence interval; GMC/GMT = geometric mean antibody concentration/titer.**

### Conclusions

Combined DTPa-HBV-IPV/Hib, which may lead to more than 3 HBV doses upon regular implementation, is immunogenic with acceptable tolerability, and offers the benefit of fewer injections to complete routine pediatric vaccination in Asian infants.

**Abbreviations:** HBV, Hepatitis B vaccine; DTPa, Diptheria-Tetanus-Acellular Pertussis; IPV, Inactivated Poliomyelitis Vaccine; Hib, *Haemophilus influenza* type b

**Funding:** GlaxoSmithKline Biologicals SA
Background and aims

Rabies is a neglected disease despite its high mortality (>99%). Post-exposure prophylaxis (PEP), consisting of thorough wound cleaning and vaccination (with/without concomitant administration of rabies immunoglobulins [RIG]) is the only effective preventative treatment measure post-rabies exposure.

Methods

We performed a systematic review and meta-analysis of articles in PubMed and Embase, published in English between 1980 and 2016, focusing on the efficacy, immunogenicity (overall, by administration method and dose) and safety of the purified chick embryo cell rabies vaccine (GSK).

Results

Of 3,601 papers retrieved (PubMed: 2,036; Embase: 1,565), 48 were included (33 interventional, 14 observational and 1 combined study).

By day (D) 14, regardless of administration methods (intramuscular [IM] or intradermal [ID]), most studies demonstrated geometric mean concentrations ≥0.5 international units (IU)/ml (considered as adequate for protection). D7 and D90 immunogenicity appeared higher for IM than ID vaccination. Meta-analyses showed no differences in efficacy rates for 4- and 5-dose IM schedules or 8-, 10-, 14- and 15-dose ID vaccination schedules. In most studies, no serious adverse events were reported. Local erythema and induration, systemic headache and lymphadenopathy seemed more frequent in ID than IM vaccination.

Conclusions

We concluded that administration methods and schedules may affect the vaccine’s immunogenicity in terms of geometric mean concentrations. However, almost all subjects regardless of administration methods or schedules achieved serum antibody titres ≥0.5 IU/ml. Efficacy rates did not depend on the number of doses received, regardless of administration method. Across studies, acceptable safety and tolerability were demonstrated.

Funding: GlaxoSmithKline Biologicals SA
Background and aims

To assist in decreasing pneumococcal infection in pediatric populations, clinicians should remain up to date on evidence-based data supporting the most effective pneumococcal conjugate vaccines (PCVs). We sought to determine if online continuing medical education (CME) could improve the knowledge and competence of pediatricians related to the use of PCVs.

Methods

An online video-based CME panel discussion was analyzed to determine efficacy of education on clinician learners after the educational intervention. Educational themes selected for the activity addressed knowledge gaps related to differentiation between available high-valent PCVs related to serotype carriage, herd protection, serotype replacement, and antibiotic use in clinical practice. Matching pre-assessment/post-assessment knowledge- and case-based questions associated with these themes were identified and analyzed by comparing participant responses before and after education.

Results

For pediatricians (n=234), the data illustrated greater clarity related to:

- Herd immunity
- Serotype replacement due to PCV use
- Antibiotic resistance and PCV use
- Post-assessment, there was a small effect of education (V=0.136), indicating a modest improvement in evidence-based choices (P <.05) across all concepts
- Linked learning results for this study show that 22% of pediatricians improved and 39% were reinforced as a result of the education; another 39% require additional intervention

Conclusions

This study demonstrates the success of an online educational activity on improving the knowledge, competence, and clinical decision making of pediatricians regarding strategies for improving appropriate use of PCVs.
EFFECTIVENESS OF THE 10-VALENT PNEUMOCOCCAL CONJUGATE VACCINE AMONG PREMATURE BABIES - RESULTS FROM A RANDOMIZED, DOUBLE-BLIND VACCINE TRIAL

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Background and aims

The prematurely born infants are in a higher risk of pneumococcal diseases than term infants and the effectiveness of some vaccines have been lower among them. We have reported the effectiveness of the 10-valent pneumococcal conjugate vaccine (PHiD-CV10) on various outcomes in the Finnish Invasive Pneumococcal disease (FinIP) vaccine trial. Now, we explored the PHiD-CV10 effectiveness in preterm infants.

Methods

FinIP was a phase III/IV cluster-randomized, double-blind vaccine trial. Two thirds of infants (enrolled <7 months of age) received PHiD-CV10 (3+1 or 2+1 schedule) and one third hepatitis B vaccine. Outcome definitions and data sources are shown in Table 1. The blinded follow-up lasted from the first vaccination date (from Feb-2009 through Oct-2010) to December 31, 2011.
### Results

Altogether 1519/30527 (5%) infants were born before 37th gestational week. The results for the 2+1/3+1 vaccination schedules combined are presented in Table 2.
Conclusions

The incidences of pneumonia and antimicrobial purchases were higher among preterm infants when compared to term infants, but the vaccine effectiveness estimates were similar among preterm and term infants. These results are reassuring for the performance of the vaccine in the subgroup of preterm infants.

Table 2. Incidence of different outcomes, and vaccine effectiveness (VE) against them among preterm and term infants.

<table>
<thead>
<tr>
<th></th>
<th>Preterm infants</th>
<th></th>
<th>Term infants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment group</td>
<td>Incidence/1000 py*</td>
<td>VE (95%CI)</td>
<td>Incidence/1000 py*</td>
</tr>
<tr>
<td>Invasive pneumococcal</td>
<td>Control</td>
<td>1</td>
<td>0.9</td>
<td>16</td>
</tr>
<tr>
<td>disease (IPD)</td>
<td>PHID-CV10</td>
<td>0</td>
<td>0</td>
<td>100 (-232 to 100)</td>
</tr>
<tr>
<td>Non-laboratory-</td>
<td>Control</td>
<td>4</td>
<td>3.9</td>
<td>83</td>
</tr>
<tr>
<td>confirmed IPD**</td>
<td>PHID-CV10</td>
<td>6</td>
<td>2.9</td>
<td>26 (-192 to 79)</td>
</tr>
<tr>
<td>Hospital-treated</td>
<td>Control</td>
<td>13</td>
<td>12.8</td>
<td>111</td>
</tr>
<tr>
<td>primary pneumonia</td>
<td>PHID-CV10</td>
<td>18</td>
<td>8.6</td>
<td>34 (-58 to 70)</td>
</tr>
<tr>
<td>Hospital-diagnosed</td>
<td>Control</td>
<td>24</td>
<td>24</td>
<td>248</td>
</tr>
<tr>
<td>pneumonia</td>
<td>PHID-CV10</td>
<td>30</td>
<td>14</td>
<td>39 (-15 to 65)</td>
</tr>
<tr>
<td>Tympanostomy tube</td>
<td>Control</td>
<td>87</td>
<td>86</td>
<td>1543</td>
</tr>
<tr>
<td>placements</td>
<td>PHID-CV10</td>
<td>141</td>
<td>67</td>
<td>21 (-20 to 45)</td>
</tr>
<tr>
<td>Antimicrobial purchases</td>
<td>Control</td>
<td>1705</td>
<td>1683</td>
<td>30278</td>
</tr>
<tr>
<td></td>
<td>PHID-CV10</td>
<td>3133</td>
<td>1495</td>
<td>12 (-0.3 to 23)</td>
</tr>
</tbody>
</table>

* person-years

**Clinically suspected, non-laboratory-confirmed IPD or unspecified sepsis
This study aimed to identify the risk factors of no/low response to immunoprophylaxis of hepatitis B vaccine in infants of hepatitis B surface antigen (HBsAg)-positive mothers and to evaluate the effects of subsequent individualized immune intervention in these infants. 144 infants of HBsAg-positive mothers enrolled in our hospital born from August 1, 2011 to January 31, 2013 were recruited in this study to complete an immunization program of three-dose hepatitis B vaccines. The risk factors of the no- or low-immune response to hepatitis B vaccinations were analyzed. Infants of the non-/low-immune response group were subsequently administered individualized immune interventions, followed by reevaluation of immune responses to hepatitis B vaccinations at 18 months of age. Logistic regression analysis showed that high level of HBeAg, HBcAb in the mother during early pregnancy, preterm delivery, low birth weight of the infants, late administration of protein supplements, and failure to receive the second dose of hepatitis B immunoglobulin (HBIG) during neonatal days 15–30 in the infants were the risk factors for no- or low-immune response (p <0.05). Moreover, 83.3% of low-immune response infants and 70.0% of non-immune response infants achieved normal-immune response at 18 months, and the HBsAb levels were significantly elevated after individualized immune interventions (p <0.05). Clinicians should be familiar with the risk factors of no/low response to immunoprophylaxis of hepatitis B vaccine in infants of HBsAg-positive mothers. Individualized immune intervention effectively enhanced the immune response and alleviated the risk of HBV infection of these infants.
DOES BCG HAVE NON-SPECIFIC EFFECTS IN UGANDAN NEONATES?

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Background and aims

There is growing evidence that neonatal BCG vaccination might provide heterologous protection against non-tuberculous pathogens. However, this theory remains controversial due to concerns about the generalizability of findings and lack of a proven biological mechanism. The reported rapid onset of heterologous protection suggests innate immune system involvement, so we conducted a randomised controlled trial of early vs. delayed BCG vaccination to investigate this.

Methods

560 healthy Ugandan neonates were randomised to receive BCG at birth or at 6 weeks of age. Cord and infant blood samples collected at time points up to 10 weeks of age were compared for 1) innate cytokine response following stimulation with non-tuberculous pathogens, 2) epigenetic modification at innate cytokine promoters, and 3) inflammatory-iron response. Clinical follow-up to 10 weeks occurred as secondary outcomes.

Results

Increases in H3K4 and H3K9 tri-methylation of innate cytokine promoters were 2-17x lower over time in BCG vaccinated infants, but this was not associated with significant differences in innate cytokine production following heterologous stimulation. BCG timing had no effect on the inflammatory-iron axis. Infectious disease incidence and mortality rate did not vary by intervention arm.

Conclusions

We found limited evidence that the non-specific effects of BCG are mediated through the innate immune system. Contrary to some previous studies, we saw no evidence of clinical non-specific benefit from BCG vaccination in early life. These findings add to the on-going debate, suggesting that previously identified heterologous effects of BCG may be limited to certain populations of high-risk infants.
Background and aims

*Haemophilus influenzae* type b (Hib) is the leading cause of bacterial pneumonia and meningitis in children under 5 years of age. Vaccines containing Hib capsular polysaccharide (HibPRP), have been highly successful in controlling the invasive Hib diseases wherever introduced. However, Hib conjugate in the Hib containing multivalent vaccines is the costliest component leading to its slow introduction in developing countries. Further, there have been reports of reduction in Hib immunogenicity after its combination with other vaccines. We have developed an improved HibPRP-TT conjugate vaccine to address the above challenges.

Methods

HibPRP was produced by bacterial fermentation using animal component free media (except hemin) with a short down-stream purification process. Fully characterized purified HibPRP was degraded chemically to average 10, 50 or 100kDa molecular weight chain length. The HibPRP-TT conjugates were prepared with high yields using activated PRP of various sizes and tetanus toxoid (TT) by reductive amination. Well-characterized HibPRP-TT conjugates were evaluated by conducting multiple immunogenicity studies in rat model and the immune responses compared with two commercially available HibPRP-TT conjugate vaccines.

Results

Anti-HibPRP serum IgG titers for the 10kDa HibPRP based conjugates were higher than other sizes tested as well as compared to the licensed comparators even at lower dose. The results from 6 independent studies showed consistency in higher immunogenicity.

Conclusions

We have developed a HibPRP-TT conjugate vaccine with better immunogenicity. Short downstream process and high immunogenicity can bring preferential impact on vaccine cost. The technology is available for partnership to develop a Hib containing multi-valent vaccine.
PRETERM CHILDREN HAVE HIGHER RISK OF INVASIVE PNEUMOCOCCAL DISEASE THAN FULL-TERM CHILDREN

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Background and aims

The risk of invasive pneumococcal disease (IPD) in children born preterm has not been investigated in a cohort study. We aimed to determine whether there is a higher risk among preterm than full-term children during the first two years of life and whether 7-valent pneumococcal conjugate vaccine (PCV7) reduced the risk of IPD.

Methods

Data on all children born in Norway 2000-2010 were obtained from the Medical Birth Registry of Norway and linked to other national registries. In total, 606,137 children were included in our study and followed until 2 years of age. Incidence rate ratios (IRRs) and confidence intervals (CI) were estimated with Poisson regression.

Results

We identified 392 cases of IPD. We observed a higher rate of IPD in preterm than in full-term children aged 0-5 months and 6-23 months, IRRs = 2.97 (95% CI 1.34, 6.61) and 1.66 (95% CI 1.14, 2.41), respectively. The IPD rates were significantly lower after introduction of PCV7 (2007-10) compared to before PCV7 was introduced (2002-05) for preterm and full-term children aged 6-23 months, IRRs = 0.10 (95% CI 0.02, 0.43) and 0.28 (95% CI 0.21, 0.38), respectively. A reduction was not observed for preterm and full-term children aged 0-5 months.

Conclusions

In this cohort study, preterm children had increased risk of IPD. After introduction of PCV7, the risk of IPD was reduced among preterm and full term children aged 6 months or older, but not among children aged 0-5 months.
HEPATITIS C PREVALENCE IN LAHORE
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Background and aims

Hepatitis C virus is one of the most common causes of chronic liver disease in developing countries like Pakistan. This study was conducted to find out prevalence of Hepatitis C Virus infection in children visiting Akhtar Saeed Trust Teaching Hospital Emergency and outpatient department.

Methods

Methodology:

It is cross-section descriptive study. Study was conducted two years from March 2014 to March 2016. Asymptomatic children visiting emergency and outpatient department, 1730 patients were selected randomly.

Patients of both genders age (05 months to 15 years) were included with male to female ration 1:1 kit method was used for screening and only positive case were repeated by ELISA for confirmation. Verbal consent was obtained and SPSS 16 was used for data analysis.

Results

Out of 1730 patients included, 5 patients were reactive which were also confirmed by ELISA. Sero-prevalence during study period was 0.28%

Conclusions

Sero-prevalence was only 0.28%. Infective cases may spread infection to community silently. Avoidance of unscreened and unnecessary blood transfusion, reuse of syringes and disposable medical Equipment is recommended to reduce this further.
DTPa-IPV/Hib COMBINED VACCINE ADMINISTERED IN HEALTHY KOREAN INFANTS:
IMMUNOGENICITY AND SAFETY FROM A PHASE III, RANDOMIZED TRIAL


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2The Catholic University of Korea, Incheon St. Mary’s Hospital College of Medicine, Incheon, Republic of Korea
3Keimyung University, School of Medicine, Daegu, Republic of Korea
4Yonsei University, Wonju College of Medicine, Wonju, Republic of Korea
5Wonkwang University Hospital, Pediatrics- Professor emeritus, Iksan, Republic of Korea
6Changwon Fatima Hospital, Pediatrics, Changwon, Republic of Korea
7Korea Cancer Center Hospital, Pediatrics, Seoul, Republic of Korea
8Chonbuk National University Hospital, Chonbuk National University Medical School, Jeonju, Republic of Korea
9The Catholic University of Korea, Uijeongbu St. Mary’s Hospital, Uijeongbu, Republic of Korea
10The Catholic University of Korea, Yeouido St. Mary’s Hospital, Seoul, Republic of Korea
11CHA University School of Medicine, CHA Bundang Medical Center, Seongnam, Republic of Korea
12GSK, Clinical Research and Development, Seoul, Republic of Korea
13GSK, Clinical Research and Development, Maryland, USA
14GSK, Biostatistics and Statistical Programming, Bangalore, India
15GSK, Asia Pacific Regional Vaccines, Singapore, Singapore
16GSK, Clinical Research and Development, Wavre, Belgium
17The Catholic University of Korea, St. Vincent’s Hospital College of Medicine, Suwon, Republic of Korea

Background and aims

Combination vaccines offer several advantages over stand-alone vaccines: simplified administration, increased patient/healthcare acceptance, increased vaccination coverage, reduced number of visits and vaccination costs. We assessed the immunogenicity and safety of 3-dose primary vaccination with combined diphtheria-tetanus-acellular pertussis-inactivated poliovirus-Haemophilus influenzae type b conjugate vaccine (DTPa-IPV/Hib) in Korean infants.

Methods

This phase III open-label, randomized, multicenter trial (NCT01309646) was conducted in 2011–2012 in the Republic of Korea to demonstrate non-inferiority of immune responses to all vaccine antigens of combined DTPa-IPV/Hib administered as single injection compared to concomitant administration of separate DTPa-IPV and Hib vaccines one month post-dose 3 (Figure 1).
Results

Of 454 infants enrolled, 451 were vaccinated and completed the study; 213 (DTPa-IPV/Hib group) and 217 (Control group) were included in the according-to-protocol cohort for immunogenicity. Non-inferiority of DTPa-IPV/Hib immune response compared to concomitant DTPa-IPV and Hib administration was demonstrated one month post-dose 3 (Figure 2). Fifty-seven serious adverse
events were reported throughout the study; none were considered vaccination-related.

**Conclusions**

DTPa-IPV/Hib was non-inferior to separate DTPa-IPV and Hib administration and had an acceptable safety profile when administered as 3-dose primary vaccination in Korean infants.

**Funding:** GlaxoSmithKline Biologicals SA
IMMUNOGENICITY AND SAFETY OF THE 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE ADMINISTERED IN A 3+1 VERSUS 2+1 SCHEDULE AMONG INFANTS IN CHINA

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Background and aims

Immunogenicity and safety of 13-valent pneumococcal conjugate vaccine (PCV13) administered as a 3- or 2-dose infant series followed by a toddler dose was examined in healthy Chinese infants.

Methods

2-month-old infants were randomized to PCV13 administered at 3, 4, 5 months (PCV13[3,4,5-mo]); 2, 4, 6 months (PCV13[2,4,6-mo]); or 3 and 5 months (PCV13[3,5-mo]). All subjects received a toddler dose at 12 months. Serotype-specific IgGs were measured 1 month after the infant series and before and after the toddler dose. Safety was evaluated.

Results

1 month after the infant series, the proportion of subjects with IgG ≥0.35 µg/mL was similar for 3- vs 2-dose schedules except for serotypes 6B and 23F, which were lower in 2-dose (70.1% and 90.6%, respectively) vs 3-dose groups (93.2%-94.7% and 95.4%-96.2%; Figure 1A). IgG GMCs were numerically lower with 2-dose versus 3-dose schedules for 7 of the 13 serotypes and were statistically significantly lower for serotypes 6B, 14, 18C, and 23F (Figure 1B). After the toddler dose, antibody levels were similar in all groups. PCV13 was well tolerated.
Conclusions

PCV13 administered as a 3- or 2-dose primary infant series followed by a toddler dose was immunogenic and well tolerated in healthy Chinese infants and likely protective against PCV13 serotypes; immune responses with a 2-dose schedule may be lower for some serotypes (Clinicaltrials.gov=NCT01692886). Funded by Pfizer.
CONTROL ACTIONS TAKEN DUE TO THE DETECTION OF A VACCINE-DERIVED POLIOVIRUS TYPE 2 FROM IMMUNODEFICIENT PATIENT (iVDPV2) CASE IN CONTEXT OF THE ANTIPOLIOMYELITIS VACCINE SWITCH

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Child born in August 2015, diagnosed with X-linked Agammaglobulinemia in May 2016. Since March 2016 the search for enterovirus in stool samples was performed due to the previous immunization with trivalent OPV even in the absence of paralysis. The identification of the iVDPV2 was in July 2016.

The aim was to describe the actions performed by the National Ministry of Health (NMH) due to the identification of the VDPV2 in samples of immunocompromised patient.
Background and aims

Kawasaki disease shock syndrome (KDSS) is a severe condition of Kawasaki disease (KD), however it is not deeply recognized at present. In this study, we performed a case-control study to ascertain the clinical presentations, laboratory features, and clinical outcomes of children who had KDSS.

Methods

Hospitalized patients, diagnosed as KD were selected in Najing children’s hospital during the period from January 2010 to March 2017. 21 patients with KDSS were enrolled in this study as case patients. 24 patients who were diagnosed as KD with normal blood pressure were selected randomly as control patients. Demographic characteristics, clinical presentations, laboratory features, cardiovascular findings and therapies were analyzed between them.

Results

Compared with controls, KDSS patients were less likely to have a diagnosis of KD at admission. Both the length of hospital stay and febrile duration of KDSS patients were longer. KDSS patients were elder and had more serious skin rash. The proportions of leukocytosis, neutrophilia, and hypoalbuminemia and the level of WBC count, CRP, BNP, and FeP of KDSS patients is more higher than that of KD patients. Meanwhile, the KDSS patients had higher incidence of myocardial dysfunction and more severe coronary artery involvement. All case patients received aspirin, glucocorticoid, and intravenous immunoglobulin(IVIG) therapy, with four receiving more than one course of IVIG. 33.3% KDSS patients required albumin, and 90.4% patients required vasoactive infusions.

Conclusions

Short-time usage of glucocorticoid may play an important part in inhibiting the inflammatory response, especially in the condition of IVIG resistant. Albumin and vasoactive drugs are useful measures to rescue shock.
CLINICAL ANALYSIS OF HOSPITALIZED CHILDREN WITH KAWASAKI DISEASE BASED ON E-SCIENCE MODEL, SINGLE CENTER REGISTRY FROM 2009 TO 2016

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Background and aims

Based on the E-Science environment, the data of Kawasaki disease (KD) patients in Shanghai Children's Hospital from 2009 to 2016 were analyzed in order to provide the basis for clinical diagnosis and treatment. The study aimed to investigate the clinical characteristics and risk factors of coronary artery lesion (CAL) in KD patients with the registry database.

Methods

The children with KD who were hospitalized in Shanghai Children's Hospital, selected according to the American Heart Association (AHA) diagnostic guidelines, the incidence of CAL was determined according to the results of cardiac ultrasonography (UCG), all clinical indexes had been tagged and captured by electronic data capture (EDC) system. Statistical analyses were conducted by the Doctor Research Information Management System (DRIMS). Clinical indexes were performed to analyze the risk factors and incidence trend of CAL.

Results

A total of 1157 cases were hospitalized mostly in spring and summer. The incidence of IVIG non-response was 13.1%. UCG found 22.92% cases of CAL, including 2.05% of coronary aneurysm. The trend of CAL incidence was declining by year. C-reactive protein (CRP) level, serum sodium level, and ALT > 40U/L or AST > 40U/L were the influencing factors of CAL.

Conclusions

Our findings highlight the frame of data management and analysis. The E-Science environment shows a good effect on the large-scale epidemiological investigation. There are certain epidemic characteristics of Kawasaki disease in our single center.
PCV 13 OR THE NEW VACCINE COVERING 19A DEVELOPED BY CHINA CAN PROVIDE GREATER SEROTYPE COVERAGE IN MAINLAND OF CHINA
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Background and aims

To review the serotype distribution of Streptococcus pneumonia (pneumococcus) among all children cases of pneumococcal infection in mainland of China, and to compare the serotypes of cases with serotypes included in pneumococcal polysaccharide conjugate vaccine PCV 7, PCV13 and PSV 23.

Methods

We searched the China hospital knowledge database (CHKD), WANFANG database, and PubMed database for systematic reviews. Median and decile range were determined.

Results

A total of 35 qualified literature citations were identified. The serotype distribution in Chinese children cases of pneumococcal infection from 2006 to 2015 was: 19F [30.9% (D: 11.7%-63.3%)], 19A [16.1% (D: 5.8%-29.4%)], 23F [9.3% (D: 3.2%-18.2%)], 14 [9.9% (D: 3.1%-19.4%)], 6B [6.4% (D: 2.9%-14.7%)], 6A [4.8% (D: 1.3%-11.9%)]. A total of 66.1% (D: 44.6%-95.1%) serotypes were covered by PCV7. 88.0% (D:75.4%—98%) serotypes were covered by PCV 13 and 90.3% (D:72.9%-98.3%) serotypes were covered by PSV 23.

Conclusions

The epidemic serotypes of children cases of pneumococcal infection in mainland of China were 19F, 19A, 23F, 14 and 6B, which were all the international common resistant serotypes. The most common serotype was still 19F. The serotypes covered by PCV 13 were much higher than that by PCV 7 because of 19A was widely distributed in China. PCV 13 or the new vaccine covering 19A developed by China can provide greater serotype coverage in mainland of China.
DESIGN OF LIVE ATTENUATED MEASLES VACCINE CANDIDATES BY INHIBITING VIRAL MRNA CAP METHYLTRANSFERASE

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²Children’s Hospital- Zhejiang University School of Medicine, Department of Genetics and Metabolism, Hangzhou, China

Background and aims

The live-attenuated measles virus vaccine (LAV) has been used for more than 50 years, the application of LAV lead to a dramatically decline of the number of reported measles cases. However, measles outbreaks occurred again in the past few years in the worldwide. LAV widely used in China is relatively safe and effective, But it still led to rash, fever and joint pain in children vaccinated with LAV. Development of a new generation of measles vaccine with less adverse effects and high immunity protective is still necessary.

Methods

2. Construction of the full-length genome cDNA for MV-Hu191
3. Recovery of MV-Hu191 from the full-length cDNA clones
4. Do site-directed mutagenesis
5. Recovery of recombinant MV-Hu191 from the full-length cDNA clones
8. Replication and pathogenesis of rMVs in animal study
9. Immunogenicity of rMVs in animal study

Results

1: We successfully recovered MTase-defective recombinant measles viruses
2: Viral replication was delayed in recombinant Measles virus carrying mutations.
3: Genetic stability of recombinant rMV mutants in cell culture
4: The MTase-defective rMVs were attenuated in animal study

5: All the MTase-defective rMVs induced high level of serum antibody

Conclusions

1: We can efficiently recover measles virus by using reverse genetics, 2: MTase-defective rMVs are excellent live measles vaccine candidates.

3: We can regard MTase as a target for attenuation of other RNA viruses
COST-EFFECTIVENESS OF A 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE (PCV13) IMMUNIZATION PROGRAM IN CHINA

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3Pfizer Inc, Medical Department, Beijing, China
4Elysia Group- LLC, Health Economics, New York, USA
5Pfizer Inc, Health Economics and Outcomes Research, Collegeville- PA, USA

Background and aims

Pneumococcal disease burden represents one of the largest burdens of vaccine preventable disease in countries without a pneumococcal vaccine program. China has recently approved the use of PCV13 to protect against pneumococcal disease caused by 13 serotypes of S. pneumoniae. The objective of this study is to estimate the clinical and economic impact of introducing a national immunization program (NIP) in China.

Methods

A 1-year decision analytic model was used to estimate costs and outcomes of vaccinating 85% of an annual birth cohort of 16 million Chinese infants from a payer perspective. PCV13 was compared to no-vaccination in preventing cases and associated costs of invasive pneumococcal disease (IPD), community acquired pneumonia (CAP), and acute otitis media (AOM). Inputs were derived from the China Health Insurance Research Association (CHIRA) database and the published literature. Because China’s population is heterogeneous and CHIRA data may not represent all of China, extensive sensitivity analyses were conducted to test ranges of input parameters.

Results

In the base case, assuming indirect effects for IPD and hospitalized CAP, PCV13 is projected to prevent more episodes and deaths, and is cost-saving compared to no vaccination (Table 1). PCV13 remained cost-saving or highly cost-effective across a number of scenarios.
Table 1: Annual Impact of Pneumococcal Vaccination in China

<table>
<thead>
<tr>
<th></th>
<th>No Vaccine</th>
<th>PCV13</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cases</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPD</td>
<td>31,861</td>
<td>19,739</td>
<td>-12,121</td>
</tr>
<tr>
<td>CAP</td>
<td>56,192,471</td>
<td>50,231,333</td>
<td>-5,961,138</td>
</tr>
<tr>
<td>AOM</td>
<td>9,273,965</td>
<td>10,049,669</td>
<td>-775,704</td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td>1,411,964</td>
<td>1,264,515</td>
<td>-147,449</td>
</tr>
<tr>
<td><strong>QALYs Lost</strong></td>
<td>29,106,545</td>
<td>32,687,397</td>
<td>3,580,852</td>
</tr>
<tr>
<td><strong>Net cost (SRMB)</strong></td>
<td>¥222,151,257,992</td>
<td>¥219,234,324,462</td>
<td>(¥2,916,933,53)</td>
</tr>
<tr>
<td><strong>ICER</strong></td>
<td></td>
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</tbody>
</table>

Conclusions

If China were to fund an NIP with PCV13, our model predicts a remarkable public health and cost-saving impact in China. While further research is needed to understand the national burden of disease, our model suggests that consideration should be made to scale up pneumococcal vaccination in China.
THE COSTS AND BENEFITS OF VARICELLA VACCINATION IN HUNGARY
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2National Institute of Child Health, St. László Hospital for Infectious Diseases, Budapest, Hungary
3Pátri-med Bt, Pátri-med Bt, Pecs, Hungary
4MSD Pharma Hungary Ltd., Medical Affairs, Budapest, Hungary
5MSD Pharma Hungary Ltd., Market Access, Budapest, Hungary
6Merck & Co.- Inc., Center for Observational and Real World Evidence, Kenilworth, USA

Background and aims

Hungary has 97,591 varicella cases annually (estimated). Although two-dose varicella vaccination is recommended at 12 and 18 months, varicella vaccines are not reimbursed and subsequently only 15% of children receive two doses. We evaluated costs and benefits of different universal varicella vaccination (UVV) options.

Methods

Pre-vaccine varicella age-specific incidence data were used to calibrate a dynamic transmission model of varicella infection. Healthcare resource utilization data and costs were estimated from expert input and available data. Five vaccination strategies were considered: 1 dose at 12mo, 90% coverage (1D); 2-dose low coverage at 12/18mo, 15%/15% (2DL); 2-dose moderate coverage at 12/18mo, 50%/50% (2DM); 2-dose high coverage, short interval at 12/18mo, 90%/80% (2DH-short); 2-dose high coverage, long interval at 18mo/6yr, 90%/80% (2DH-long). Costs were estimated in Hungarian Forint (HUF). A 3.7% discount rate, 25-year time horizon, and societal perspective were used for costs and benefits.

Results

The estimated reduction in the pre-vaccine incidence rate of 1247 varicella cases/100,000 population is 74% (325/100,000) after 5 years with 1D. Implementation of 2DH-long will lead to a further 50% decline (178/100,000) within 5 years. 2DH-short reduces incidence to 280/100,000 in 5 years. All strategies except for the currently-implemented 2DL were cost-saving, with annual savings from 31M-978M HUF. The benefit-cost ratios of the four cost-saving strategies were 1.94 [1D], 1.34 [2DH-long], 1.21 [2DH-short], and 1.03 [2DM].

Conclusions

UVV is cost-saving, except for the current situation (2DL). Two-dose strategies are more effective but more costly. 2DH-short has some short-term advantages, but 2DH-long is more impactful and cost-saving.
A COST-BENEFIT ANALYSIS OF UNIVERSAL VARICELLA VACCINATION IN TURKEY
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2Ege University, Department of Pediatrics Faculty of Medicine, Izmir, Turkey
3MSD Turkey, Medical Affairs, Istanbul, Turkey
4Merck & Co.- Inc., Center for Observational and Real World Evidence, Kenilworth, USA

Background and aims

In 2013, Turkey introduced universal varicella vaccination (UVV) for children 12 months of age and achieved 97% coverage. Inclusion of a routine second dose administered at existing vaccination visits at 18 months or six years is being considered. We evaluated costs and benefits of different UVV options.

Methods

A dynamic transmission model of varicella infection was calibrated to age-specific pre-vaccine varicella seroprevalence data. Healthcare resource utilization data and costs were sourced from the ongoing “Varicella-related hospitalizations in Turkey (VARICOMP)” study. Three vaccination strategies were considered: one dose at 12 months/95% coverage (1D); two-dose short with second dose at 18 months/90% coverage (2D-short); two-dose long with second dose at six years/90% coverage (2D-long). All costs were estimated in Turkish Lira (TL)/Euros (€), and used a 3% discount rate for costs and benefits. A 25-year time horizon and societal perspective were used.

Results

The pre-vaccine varicella incidence was 1716 cases/100,000 population (estimated), which reduces 88% to 192/100,000 after five years of single-dose vaccination. 2D-short would reduce varicella incidence by 92% (138/100,000) and 98.5% (23/100,000) within 5 and 25 years, respectively. Similarly, 2D-long would reduce varicella incidence by 90% (173/100,000) and 99% (20/100,000). Four years after 2D-long start, it outperforms 2D-short. All strategies were cost-saving. The benefit-cost ratios of the three strategies were 22.3 for 1D, 10.8 for 2D-long, and 8.3 2D-short.

Conclusions

Both one- and two-dose UVV are cost-saving. Two-dose strategies are more effective but more costly; 2D-short has short-term advantages in decreasing breakthrough varicella, but 2D-long will result in the lowest long-term incidence.
ACUTE DISSEMINATED ENCEPHALOMYELITIS FOLLOWING VACCINATION AGAINST ENTEROVIRUS 71 IN A CHILD: A CASE REPORT AND LITERATURE REVIEW

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Acute disseminated encephalomyelitis (ADEM) is an inflammatory demyelinating disease of the central nervous system, which has been associated with several vaccines such as rabies, smallpox, diphtheria-tetanus-polio, measles, mumps, Japanese encephalitis, rubella, pertussis, influenza, and the Hog vaccine. Here, we presented a case of 7 month-old child who suffered from ADEM 21 hours after administration of an inactivated vaccine against EV71. She was admitted to our hospital with symptoms of weakness of left limbs, high fever and alteration of consciousness. Some abnormalities were also found in CSF and EEG (electrical status epilepticus). The findings of MRI also detected some abnormal lesions located in the right brain and both basal ganglia region. Treatment with high-dose corticosteroids and intravenous immunoglobulin had significant effect, with marked improvement of the clinical symptoms, the EEG and the results of CSF. The clinical features, the findings of CSF and MRI, and therapeutic effect may contribute to such diagnosis of ADEM.
EFFECT OF AN IMMUNOMODULATOR COMPOSED OF MURAMYL DIPEPTIDE AND ANTI-CD10 MONOCLONAL ANTIBODY ON THE ACTIVATION OF MEMORY T CELLS IN VITRO

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Background and aims

To explore the impact of the new immunomodulator that combined muramyl dipeptide with anti-CD10 monoclonal antibody (MDP-Ab), which is intended for the treatment of leukemia by activating the specific memory T lymphocytes in peripheral blood of healthy children.

Methods

Peripheral blood mononuclear cells (PBMC) of healthy children were isolated and were divided into three groups: unstimulated group (anti-CD28 Mab, 0.5μg/mL), MDP-Ab group (anti-CD28 Mab+MDP-Ab, 20μg/mL), BCG group (anti-CD28 Mab+BCG, 20μg/mL). The supernatant of cells was collected at the time points of 0, 12, 24, 48 and 72 hours respectively, and the IFN-γ levels were measured by ELISA. The whole blood was diluted and were divided into four groups: control, MDP-Ab, BCG and PHA (anti-CD28 MAb+PHA 20μg/mL). After 48-hour incubation, the cells were collected. The flow cytometry was applied to analyze the expression of surface molecules of CD3, CD4, CD45RA, CD69 and cytokines of IFN-γ.

Results

Morphology of cells: Compared with the control group, the cells in the MDP-Ab group and the BCG group showed cell aggregation after 24 hours of culture, and the cell morphology in the cell mass was discernible. As the time went on, the number of cell clusters increased, which was the most obvious in BCG group.

Conclusions

MDP-Ab can stimulate the secretion of IFN-γ in memory T lymphocytes of healthy children, and induce CD69 (early activation marker) expression on CD4+CD45RA+T lymphocyte. The immune response led by MDP-Ab is similar with that of BCG stimulation, suggesting that MDP-Ab can induce BCG antigen-specific CD4+ T lymphocyte activation in vitro.
IL-17A AUTOANTIBODY INDUCED BY RECOMBINANT MYCOBACTERIUM SMEGMATIS ALLEVIATE AIRWAY INFLAMMATION IN NON-EOSINOPHILIC ASTHMA

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Background and aims

Asthma is a chronic airway inflammation disease. About 10% patients don't respond well to inhaled corticosteroids, whose airway usually expressed high level of interleukine-17A (IL-17A) protein and influx of neutrophils. In our previous study, we have constructed a recombinant Mycobacterium smegmatis expressing fusion protein Ag85a-IL-17A (rMS-Ag85a-IL-17A, rMS) and confirmed it can induce IL-17A autoantibody to attenuate asthmatic airway inflammation. As IL-17A is closely related to neutrophils, here we further investigated the effect and underlying mechanism of rMS on neutrophils.

Methods

DO11.10 mice were divided into control group, asthma group, rMS-Ag85a-IL-17a-group and MS group. H&E stained differential count were performed in BALF. ELISA assay were performed tomeasure IL-17A, IL-6, IL-23, TNF-α, CXCL-1 and CXCL-2 expression levels in BALF and activity value of IL-17A autoantibody in sera. RT-PCR were performed to detect mRNA expression level of ENA-78, NAP-2, NE, T-bet, GATA-3 and ROR-γt in lung tissues. Then, we determined MPO activity in both BALF and lung tissues.

Results

Do11.10 mice can induce high tittered IL-17A autoantibody by intranasal with rMS. The quantity of neutrophils, neutrophil’s cytokines and chemokines in BALF were largely reduced after immunizing with rMS. The activity of MPO and mRNA expression level of NE and MMP-9 were also found inhibited. And both Peribronchiolar inflammation and airway goblet cell with mucus hyperscreation were reduced in histological pathology.

Conclusions

Our data indicated immunization with recombinant Mycobacterium smegmatis resulted in sustained high levels of IL-17A autoantibodies, which can attenuate airway inflammation via suppressing immunoregulation and degranulation of neutrophils in a non-eosinophilic murine asthma model.
Background and aims

Background: In Quebec, 7-valent (PCV7), 10-valent (PCV10) and 13-valent (PCV13) pneumococcal conjugate vaccines were successively used for children immunization according to a 2+1 doses schedule.

Objective: To assess the impact of this program on the frequency of otitis media episodes (OME).

Methods

Methods: The study population included children born in 2000-2012 and observed up to their 2nd-year anniversary. Physicians’ claims obtained from the provincial health insurance board were analyzed. Monthly birth cohorts were classified according to the main vaccine used (≥90% of doses). Hazard ratios were computed by Anderson-Gill model adjusting for potential confounders.

Results

Results: There were a total of 1,050,940 episodes among 349,139 children in the study population of 700,658 children. The annual OME rate declined from 2002 to 2005 and stabilized thereafter. Cumulative OME rate was, respectively, 1.96, 1.43, 1.43 and 1.34/child among those not exposed or exposed to PCV7-only, PCV10-only and PCV13-only (p<0.0001). Mean age at 1st OME after the age of 90 days was, respectively, 11.5, 12.4, 12.7 and 12.2 months in the 4 cohorts. Ambient air temperature, season of birth, calendar year, early OME, intensity of respiratory viruses circulation were independent predictors of OME after the age of 90 days. Children exposed to PCV vaccines had a reduced OME risk than those not exposed.

Conclusions

Conclusion: Results of this ecological study should be interpreted with caution as unmeasured confounders may exist, such as changes in the accessibility of health-care services and medical practice during the study period.
Serum 25-hydroxyvitamin D3 Levels Are Associated with the Development of Coronary Artery Lesion and IVIG Resistance in Kawasaki Disease

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Background and aims

The aim of this study is to assess the serum 25-hydroxyvitamin D3 [25-(OH)D3] levels in children with KD and investigate the role of 25-(OH)D3 in the development of coronary artery lesion (CAL) and resistance to intravenous immunoglobulin (IVIG) in KD.

Methods

68 children with KD in the acute phase were enrolled and divided into two groups respectively based on the presence or absence of CAL (CAL=25; NCAL=43) and the efficacy of IVIG (IVIG-responder=54; IVIG-resistant=14). While age-/sex-matched 30 healthy children were recruited as healthy controls. We sought relationships between 25-(OH)D3 levels and other different laboratory data during the acute phase of KD as well.

Results

Serum 25-(OH)D3 levels in KD patients during the acute phase (22.54±9.75 ng/ml) were significantly lower than in the healthy controls (35.55±6.88 ng/ml) and in KD patients during convalescence phase (30.21±10.62 ng/ml) after IVIG treatment (P<0.05), and negatively correlated with serum ferritin (SF), red cell distribution width (RDW), mean platelet volume (MPV) and serum creatinine (Scr) in children with KD (r=-0.36, r=-0.29, r=-0.41, r=-0.38; respectively; P<0.05). Serum 25-(OH)D3 levels in CAL group (18.38±7.72 ng/ml) and the NCAL group (24.96±10.06 ng/ml) during the acute phase were significantly lower than in the healthy controls while they were the lowest in the CAL group, there were statistical differences between each group (respectively; P<0.01). Serum 25-(OH) D3 levels in IVIG-resistant group (17.65±7.07 ng/ml) and the IVIG-sensitive group (24.05±10.01 ng/ml) during acute phase were significantly lower than the healthy controls while they were the lowest in IVIG-resistant group, there were statistical differences between each group (respectively; P<0.05).

Conclusions

Inappropriately decreased serum 25-(OH) D3 levels might be associated with the occurrence of CAL and IVIG-resistance in the acute phase of KD patients.
CLINICAL MANIFESTATIONS AND ENDOSCOPIC FEATURES OF ABDOMINAL TYPE HENOCH SCHONLEIN PURPURA IN CHILDREN
Y.S. Wang1, J. Zhang1, X.Q. Li1, F. Zhou1, J. Yu1
1Zhengzhou Children's Hospital, Department of Gastroenterology, Zhengzhou, China

Background and aims

To study the clinical manifestations, endoscopic and histopathological features of abdominal type Henoch Schonlein purpura (HSP) in children.

Methods

Retrospective review was made on the clinical, endoscopic and histopathological features of children with abdominal type Henoch Schonlein purpura. 151 cases of abdominal pain for starting the main performance of the children. The changes of Th17/Treg ratio were analyzed.

Results

The main symptoms of Henoch Schonlein purpura were abdominal pain (100%), skin purpura (66.22%), vomiting (47.68%), haematemesis (39.07%); 8 cases with joint swelling and arthralgia (5.29%). Laboratory examination were increased peripheral blood white blood cells (75.49%), C reactive protein (CRP) were increased (31.78%), albumin decreased (13.90%). The commonest and most serious position was the descendent duodenum (80.20%). Histopathology showed swollen vascular endothelial cells of capillary vessels and small blood vessels (38.54%), 10 cases with Helicobacter pylori infection, and the rest were chronic inflammation of the mucosa. 55 cases of colonoscopy showed: sheet bleeding and erythema (89.09%), erosions or multiple ulcers with bleeding (49.09%). The commonest and most serious position was the terminal ileum (76.36%). The frequency of Th17 cells in peripheral blood was higher in abdominal type Henoch Schonlein purpura than in controls. The ratio of Th17/Treg was higher than controls.

Conclusions

Children abdominal type Henoch Schonlein purpura clinical manifestations of diversity, lesions commonly involved descending part of the duodenum and the terminal ileum, endoscopy with mucosal biopsy are useful in diagnosis of children with abdominal pain a of Henoch Schonlein purpura. The ratio of Th17/Treg imbalance could become the forecast index to measure the severity in abdominal type Henoch Schonlein purpura.
CLINICAL ANALYSIS OF INCOMPLETE KAWASAKI DISEASE WITHOUT FEVER

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BACKGROUND: Incomplete Kawasaki disease (KD) is suspected when patients have fever for at least five days with only two or three of the principal clinical features. The occurrence of KD without fever is extremely rare.

METHODS: We report a girl who developed cervical lymphadenopathy, bilateral nonexudative conjunctivitis and coronary artery dilatation accompanied by elevated CRP and ESR, but in the absence of fever. And a literature review was performed.

RESULTS: A 8-year-old girl initially developed a cervical lymphadenopathy for 2.4 cm in diameter and nonexudative bilateral conjunctivitis without fever. Erythrocyte sedimentation rate was 60 mm/h, procalcitonin was 0.05ng/mL (N< 0.5), C-reactive protein (CRP) was 62.4 mg/L (N < 8 mg/L). We obtained an echocardiogram, which demonstrated dilatation of the proximal right (5.6mm), the proximal left anterior (5.5 mm) without coronary thrombosis. After intra-venous immunoglobulin (IVIG) and high-dose aspirin treatment, low-dose aspirin was given after that. CRP and ESR finally normalized. Serial echocardiograms demonstrated a decrease in size of her coronary system (right coronary artery diameter, 3.6mm, proximal left anterior diameter 3.4 mm) after 42 days of onset. Other three KD patients without fever were discovered by literature searching.

CONCLUSIONS: It’s important to identify incomplete KD for preventing coronary complications, especially when the patient doesn’t have fever.
DETECTION OF TH1/TH2 AND TREG/TH17 CYTOKINES IMBALANCE IN CHILDREN WITH ASTHMA BY FLOW CYTOMETRY CBA

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Background and aims

Asthma is a chronic airway inflammatory disease which seriously threatens the physical and mental health of children. In this study, the expression of Th1, Th2, Th17 and Treg cytokines in the serum of children with asthma during the acute phase was detected by flow cytometry CBA, so as to explore the imbalance of Th1/Th2 and Treg/Th17 in children with asthma.

Methods

81 children with asthma (asthma group) and 38 healthy children (control group) were recruited in this study, who were admitted to the Qilu Children’ Hospital of Shandong University from October 2013 to December 2014.

Results

1. There were no differences in age, sex between the two groups; 2. Compared with the control group, each age group the proportion of cells in CD4T and CD3, 2 years old CD4/CD8 were significantly lower (P<0.01 or P<0.05), the proportion of CD8 cells in various age groups and more than 2 year old CD4/CD8 in the two groups had no significant difference (P>0.05); 3. Compared with the control group, serum Th1 cytokines in children with asthma IL-2 and IFN-γ were significantly increased (P<0.05), and the content of TNF in serum of the two groups had no significant difference (P>0.05).

Conclusions

Th1 cell hyperfunction, the function of Th2 and Treg cells decreased, and Th1/Th2 and Treg/Th17 cytokine imbalance may play an important role in the pathogenesis of asthma with children. And the CBA method can be used to exactly evaluate the expression of Th1/Th2 and Treg/Th17 cytokines.
Background and aims

Autoimmune encephalitis (AE) refers to encephalitis which is mediated by autoimmune mechanism. The early clinical manifestations and cerebrospinal fluid were similar to those of viral encephalitis, but their property was different. The most common autoimmune encephalitis in pediatric neurology is anti-N-methyl-D-aspartic acid (NMDA) receptor encephalitis, which accounted for 80% of AE. It is a group of diseases characterized by involuntary movements, cognitive impairment, seizures and abnormal mental behavior. It is the central nervous system inflammatory disease caused by abnormal immune response to neuron antigen components.

Methods

In this paper, combined with literature review, we presented a 9 year-old female child with anti-NMDA receptor encephalitis presented with aggravation of consciousness disorders, personality changes, sleep loss and aggressive behavior after the symptoms of herpes simplex virus encephalitis were significantly improved with antibodies for NMDA receptors were detected.

Results

She was treated with intravenous immune globulin and glucocorticoid resulting in improvement of her main symptoms.

Conclusions

Our main purpose in presenting this case is to remind peers of anti-NMDA receptor encephalitis caused by immune virus infection in patients with herpes simplex virus encephalitis presented with aggravation after clinical symptoms remission.
TREND OF CARBAPENEM-RESISTANT INVASIVE KLEBSIELLA PNEUMONIAE AMONG UNDER FIVE BANGLADESHI CHILDREN: 2004 – 2014
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Background and aims

Carbapenem-resistant Klebsiella pneumoniae (CRKP) is frequently isolated from blood and has the potential to horizontally transfer antibiotic resistance to other bacterial species. We analyzed the prevalence of CRKP, its correlation with carbapenem consumption in Bangladesh and resistance to other classes of antibiotics among blood specimens of <5-year-old children in Bangladesh from 2004 to 2014.

Methods

Antibiotic susceptibility and minimum inhibitory concentration of 342 K. pneumoniae isolates (from blood and/or cerebrospinal fluid) during 2004-14, was done by disc diffusion and broth dilution methods following CLSI guidelines. Data on meropenem consumption was obtained from Integrated Marketing Services (IMS).

Results

Of 342 K. pneumoniae isolates, 21% were resistant to carbapenem. Resistance first appeared in 2008 and then sharply increased, reaching 65% in 2014. Carbapenem became available in 2006 and emergence of CRKP showed a positive correlation (r=0.8281, p=0.0016) with increased carbapenem consumption. CRKP isolates showed higher non-susceptibility to amikacin than carbapenem susceptible ones (86% versus 49%), while no significant difference was observed for other antibiotics. Trend of non-susceptibility for ampicillin, ceftriaxone, cotrimoxazole, and ciprofloxacin remained consistently high (80-100%), whereas amikacin and chloramphenicol showed increasing (39% in 2008/09 to 80% in 2014) and decreasing (70% in 2008/09 to 30% in 2014) trends, respectively.

Conclusions

Isolation of CRKP from blood culture of <5 children is increasing in Bangladesh. CRKP isolates also exhibit higher resistance towards other antibiotics, limiting options for antibiotic treatment. Molecular and epidemiological experiments are underway to understand mechanism, origin and dissemination of carbapenem resistance in Bangladesh.
PREVALENCE AND CLINICAL OUTCOME OF CARBAPENEM-RESISTANT ENTEROBACTERIACEAE AMONG PEDIATRIC PATIENTS AT A THAI TERTIARY CARE CENTER

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Background and aims

Carbapenem-resistant Enterobacteriaceae (CRE) has been increased worldwide. There is limited data of CRE among pediatric population. This study aims to survey the prevalence and clinical characteristics of CRE infections among pediatric inpatients at King Chulalongkorn Memorial Hospital, Bangkok, Thailand.

Methods

A retrospective study of children <18 years who had clinical isolates of Klebsiella pneumoniae and Escherichia coli. CRE were defined as any clinical Enterobacteriaceae isolate non-susceptible to either imipenem or meropenem and resistant to ceftriaxone, cefotaxime and ceftazidime determined by antimicrobial susceptibility testing.

Results

From January to December 2016, 16 children had CRE-related infection (11 K. pneumoniae and 5 E. coli). Prevalence of carbapenem resistance was 22.4% (95% CI 13.5-34.8) among K. pneumoniae and 3.8% among E. coli isolates (95% CI 2.3-6.3). The median (range) age was 16 months (2 days to 14 years). Common co-morbidities were immunosuppression (5; 31%) and congenital heart disease (3; 19%). Site of CRE infections were urinary tract infection (5; 31%), bacteremia (4; 25%), pneumonia (4; 25%) and skin/soft tissue infection (3; 19%). The median (range) length of hospitalization before CRE infection was 21 days (1–240). Antibiotics treatment regimens were 9 (56%) combination carbapenem with colistin or aminoglycoside, 4 (25%) carbapenem, 3 (19%) amikacin. One died from Klebsiella pneumoniae pneumonia with respiratory failure.

Conclusions

CRE infections in children are common with higher prevalence of resistance in Klebsiella pneumoniae and usually occurred in children with comorbidities. Ongoing surveillance and infection control is needed.
Urinary tract infection (UTI) is one of the most common bacterial infections in childhood. The choice of oral treatment of urinary infection become important due to patient comfort and cost effectivity. With this study, we attempted to investigate in vitro susceptibility of cefaclor, cefixime, cefdinir, cefuroxime and amoxicillin clavulonic acid in the isolates of UTI of pediatric patients.
Background

Children due to the development stage and growth of immune function is not yet mature, And in the disease type less common chronic or degenerative diseases, So the hospital in Healthcare Associated Infections and infection sites, Strain and drug resistance are different from adults.

Methods

We analyzed healthcare-associated infections of inpatients in a Children’s hospital in Taiwan from year 2015 to 2016 retrospectively. Healthcare-associated infections were identified and monitored according to CDC’s definition in 2009.

Results

A total of 169 persons in year 2015 (83 persons) and 2016 (86 persons) have had healthcare-associated infections. For infection site, bloodstream infection accounted for the largest proportion with 44.4% (75 persons). Gram negative bacteria comprised 77.8% of total isolates, and were the most common pathogens in bloodstream infection, urinary tract infection and respiratory tract infection. Methicillin resistance of *Staphylococcus aureus* had risen from 0% in year 2015 to 66.7% in year 2016 (p<0.01). Other resistant pathogens were not isolated from the Children’s hospital.

Conclusion

Bloodstream infection is the most common infection site in the Children’s hospital. MRSA infection is emerging while no other multiple drug resistant organisms (MDRO) was found. We suggest healthcare personnel to implement hand hygiene and isolation practices properly, while infection control personnel should provide education and training, analyze surveillance data regularly, in order to promptly identify possible clusters or outbreaks.
PREVALENCE OF COMMUNITY-ASSOCIATED METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS IN OTTORHEA CASES IN BANGLADESH AND POSSIBLE TREATMENT

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Background and aims

Community associated methicillin resistant Staphylococcus aureus as a possible cause of otitis media (OM) has been reported from many parts of the world. However, there is no comprehensive study on OM with MRSA infection from Bangladesh. We investigated the burden of MRSA and their antibiotic susceptibility pattern in OM cases amongst Bangladeshi children.

Methods

Ear swabs were collected from children with otorrhea visiting Dhaka Shishu Hospital from July 2013 to January 2016. S. aureus isolates were screened by tube coagulase test and confirmed by PCR (detecting nuc-gene). MRSA was identified by cefoxitin disc diffusion test and detection of the meca gene. Antibiotic susceptibility was tested following CLSI guidelines

Results

Overall, 191 (8.8%) S. aureus isolates were found from 2,164 otorrhea cases and 29% (56/191) were MRSA. Antibiotic susceptibility tests showed that about 90% of all MRSA isolates were susceptible to gentamycin, chloramphenicol, cloxacillin and imipenem, while >90% were non-susceptible to azithromycin, ceftazidime, erythromycin, cefixime, ampicillin and ceftriaxone. All MRSA isolates were susceptible to cotrimoxazole. In case of MSSA (methicillin sensitive S. aureus), 90% were susceptible to all tested antibiotics but azithromycin (17%), erythromycin (4 %), ampicillin (12%) and cefixime (6%).

Conclusions

Pan sensitivity of MRSA to cotrimoxazole suggests that in Bangladesh MRSA infections can be successfully treated with this drug instead of newer generation antibiotics. This will reduce use of newer antibiotics and curb emergence of resistance. However, continuous surveillance of antibiotic susceptibility patterns is crucial for real-time evidence-based treatment policies.
PREVALENCE OF EXTENDED SPECTRUM BETA LACTAMASE (ESBL) ENTEROBACTERIACEA IN PEDIATRIC BLOODSTREAM INFECTION IN NIGERIA

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Background

Bacteremia is a leading cause of death in developing countries but etiologic evaluation is infrequent and empiric antibiotics are not evidence-based. We recently established surveillance for community acquired bacteremic syndromes in young Nigerian children in Central and northwest Nigeria.

Method

Blood culture from suspected cases of sepsis from children less than 5 years were processed using automated Bactec® incubator System. Enterobacteriacea were identified to the species level using Analytical Profile Index (API) identification strip. Antibiotic susceptibility profile was determined by the disc diffusion method and multi drug resistant strains were then confirmed for extended spectrum beta lactamase (ESBL) production by the combination disk method as recommended by Clinical and Laboratory Standard Institute (CLSI).

Result

From Sept 2008-Dec 2016, over 21,000 children were screened for bactereamia with a culture positivity rate of 12.5%. Enterobacteriaceae, excluding Salmonellae, accounted for 32% of isolates and consist of Klebsiella species 141(45.04%) Escherichia coli 96 (30.67%), Enterobacter species 42 (13.42%) and others 34 (10.86%) (Serratia, Pantoea, Citrobacter, Proteus and Kluyvera species). ESBL producers (n = 160) represented 51.12% of the 313 Enterobacteriaceae. High resistance rates (>90%) were observed among ESBL-positive isolates for Ceftriaxone, Aztreonam, Cefpodoxime, Cefazidime and sulphanemetoxazole- trimethoprim, while 80-90% of the isolates were susceptible to Imipenem, Amikacin and Meropenem.

Conclusion

There is a high prevalence of resistance to commonly used antibiotics due to ESBL producing organisms. Etiologic diagnosis of bacteremia should be widely promoted to guide the use of
appropriate antibiotics and stem the rising tide of antimicrobial resistance. Further studies of the molecular epidemiology of ESBL-producing Enterobacteriaceae are underway to inform optimal alternative treatment strategies.
Recently, drug resistance issue is one of problem in NICU. We faced many drugs, especially antibiotic, had been insensitive to kill bacteria. Many hospital use empirical antibiotic to treat patients because lack of bacteria pattern, and leading to many drug resistance. In Indonesia, study in Bali and Jakarta found that Gram negative is dominated. Our NICU need more study although we had it at 2015. This study is presented to provide a database of bacteria pattern and its sensitivity to antibiotic.
Background and aims

The infection rate of resistant *Mycoplasma pneumoniae* (MP) is rising, and causes serious harm to the health of adolescents. This study focused on the surveillance of *M. pneumoniae* infection and drug resistance mechanism.

Methods

822 throat swab specimens were collected in Beijing in 2014. P1 gene and drug resistance-related genes were analyzed. The minimal inhibitory concentrations (MICs) of the *M. pneumoniae* isolates were detected using macrolides, tetracyclines and quinolones.

Results

1. The PCR results showed that 341 were positive and 236 were with macrolide-resistance associated point mutation including 199 with A2063G (58.36%), 25 with A2064G (7.33%), and 12 with both (3.52%). 2. All the isolates with mutation in 23S rRNA V region were resistant to macrolides. The MIC values of 65 isolates were detected, and all the isolates were sensitive to tetracyclines and quinolones. 3. 57 isolates were type 1 and 8 were type 2 according to the P1 genotype, and macrolides resistance-related mutations were found both in the two types. 4. Mutations related to quinolone resistance and mutations in L4 and L22 were found in either macrolide-sensitive or resistant strains.

Conclusions

*M. pneumoniae* isolates were highly resistant to macrolide antibiotics, and the key mechanism was the mutations in 23S rRNA V region. P1 type I *M. pneumoniae* was the dominant type. Mutations in L4, L22, and quinolone resistance-related gene were detected in either macrolide-sensitive or resistant strains, which need further studies.
Background and aims

*Bordetella pertussis* strains with high levels of macrolide resistance emerged recently in China and antibiotic treatments for pertussis are extremely limited. The objective of the study is to identify the susceptibility of more antibiotics to *Bordetella pertussis* isolated from children in 2016 in Hangzhou, which may help in finding effective antibiotics to treat infections caused by macrolide-resistant strains.

Methods

Nasopharyngeal swabs from suspected pertussis children hospitalized in our hospital in 2016 were collected. The specimens were inoculated on Bordetella-selective agar in 2 hours and were incubated at 37°C for 7 days. Strains were confirmed by agglutination with specific antisera against *Bordetella pertussis* and mass spectrometry analysis. The MICs of antibiotics were determined by E-test method.

Results

Strains of *Bordetella pertussis* were isolated from 125 patients (29.4%) who aged from 24d~9y7m (median, 4m; 66.4% was not more than 6 months). MICs of erythromycin, azithromycin and clindamycin in 125 strains were >256μg/ml and 73.6% were high levels resistant strains. MIC\(_{90}\) of ampicillin, cefuroxime, ceftriaxone, cefperazone/Sulbactam and trimethoprim-sulfamethoxazole were 0.25μg/ml, 8μg/ml, 0.19μg/ml, 0.047μg/ml and 0.5μg/ml, respectively. Eighty percent of the patients treated with antibiotics (macrolides 48.0%, Cefperazone/Sulfactam 20%, ampicillin or piperacillin 12%) had significantly improvement symptoms after pathogens were eliminated in nasopharynx. Symptoms were relapse in 20% of the patients.

Conclusions

Macrolide resistance of the *Bordetella pertussis* population has been a serious problem in Hangzhou, China. β-lactams, such as cefperazone or ampicillin, are candidates for treating infection caused by macrolides-resistant *Bordetella pertussis*. 
PREVALENCE AND ANTIBIOTIC RESISTANCE PATTERNS OF PATHOGENS IN CHILDREN WITH SEPSIS IN YUNNAN PROVINCE, CHINA, 2013-2016
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Background and aims
Prevalence and antibiotic resistance patterns of pathogens in children with sepsis will be important for the treatment and prevention of sepsis.

Methods
Blood samples from 1560 sepsis patients (4 days to 16 years old) with positive culture results were collected from 2013 to 2016 in Southwest China. Isolated pathogens were identified using the Vitek-32 system. Gram stain results were used to guide subcultures and susceptibility testing. The antimicrobial susceptibility of isolates was determined using the disc diffusion method.

Results
The most prevalent pathogens were Coagulase negative staphylococcus (CNS) (43.4%), E. coli (17.5%), Staphylococcus aureus (10.9%) Klebsiella (5.8%) and Salmonella (5.5%). In young infants aged ≤1 month, CNS was the organism most frequently isolated (59.5%), followed by E. coli (19.4%), Klebsiella (5.9%) and Staphylococcus aureus (5.1%) However, in young infants aged >1 month, the most frequently isolated organism was CNS (31.5%), followed by E. coli (12.5%), Staphylococcus aureus (5.8%). Antimicrobial susceptibility tests indicated that the susceptibility rates of CNS isolates to penicillin G, erythromycin, oxacillin, cefazolin and clindamycin were 96.6%, 88.7%, 84.1%, 80.8% and 74.1%, respectively. Vancomycin was identified as the most effective antibiotics for CNS, with susceptibility rates of 100%. Meanwhile, for E. coli isolates, ciprofloxacin was identified as the most effective. As for ceftazidime was identified as the most effective cephalosporin. In addition, the susceptibility rates of Cefoperazone/sulbactam and imipenem against E. coli were 75.4% and 100%.

Conclusions
The emergence of resistant strains should be continuously monitored, and provide reference for the selection of appropriate antibiotics.
DISCRIMINATION BETWEEN WILD-TYPE AND MACROLIDE-RESISTANT MYCOPLASMA PNEUMONIAE BY MATRIX-ASSISTED LASER DESORPTION/IONIZATION TIME-OF-FLIGHT MASS SPECTROMETRY

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Background and aims

Mycoplasma pneumonia is a significant cause of community-acquired pneumonia, which is only treated with macrolides for children who are less than eight years old. The identification of these resistant strains relies on time consuming and labor-intensive procedure. To explore the low molecular weight differential peptides in macrolides-resistant strains, thereby establishing a diagnostic model for macrolides-resistant strains.

Methods

Macrolides-resistant strains (n=15) and sensitive strains (n=1) were isolated from children with Mycoplasma pneumoniae pneumonia and FH strain were analyzed by Matrix Assisted Laser Desorption/Ionization Time-Of-Fight Mass Spectrometry (MATDI-TOF MS). All strains from the training set were tested and arranged under the application of ClinProt™software v.2.1, and thus provides benefits for future sorting of Macrolides-resistant strains and sensitive strains. A pattern for identifying Macrolides-resistant strains was established by Quick classifier (QC).

Results

Macrolides-resistant strains showed resistance to macrolide resistant azithromycin, with high MIC of >64µg/ml. ClinPro Tools software was used to discover 27 differential peaks (p<0.05) in m/z spectra ranging from 1,000 to 10,000 Da. There were 25 up regulated and 2 down regulated peptides in Macrolides-resistant strains. Three diagnostic models were constructed based on QC method was best with 100% of recognition capability. The top significant peaks of 4043.48 and 6953.56 (m/z) had the ability to distinguish the Macrolides-resistant strains.

Conclusions

This QC model with 4043.48 and 6953.56 (m/z) peptides was valuable pattern for Macrolides-resistant strains and may be a potential diagnostic tool in the future.
HIGH RATE OF MULTIDRUG RESISTANT ORGANISMS AMONG CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTION IN A THAI PEDIATRIC TERTIARY CARE HOSPITAL
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Background and aims

Central line-associated blood stream infection(CLABSI) is an important hospital acquired infection related to high mortality rate. This study aims to describe incidence of CLABSI, proportion of multidrug-resistant organisms(MDROs) and 30-day mortality rate.

Methods

A retrospective chart review study was conducted at Department of Pediatrics, King Chulalongkorn Memorial Hospital. CLABSI was defined as blood stream infection in central line-inserted patient without other identified source of infection. MDROs were defined as gram-negative organisms which resist at least 2 classes of antibiotics or gram-positive organisms that resist to oxacillin/ampicillin.

Results

From January to December 2016, there were 53 episodes contributed to CLABSI incidence 4.26 per 1000 catheter-days. Eighteen(34%) were admitted to ICU, 16(30%) had congenital heart and 11(21%) were receiving parenteral nutrition. Type of catheter included 78% multi-lumen, 9% single-lumen and 13% peripherally inserted central catheter(PICC). The most common insertion sites were jugular vein(46%), subclavian vein(18%), femoral vein(16%) and basilic vein(14%). Median(IQR) time to CLABSI was 4 days(3-7.5) in femoral site compared to 12 days(6-19) among other sites(p = 0.08). The causative organisms are 34(64%) gram-negative organisms; K. pneumoniae(6), E. coli(5), A. baumannii(5), S. maltophilia(5), P. aeruginosa(4), others(9); 16(30%) gram-positive organisms; coagulase-negative Staphylococci(7), S. aureus(4), Streptococcus spp.(3), Enterococci spp.(2); and 3(6%) Candida spp. Overall prevalence of MDROs was 58%(95% CI 44-70) including 35% of carbapenem-resistant gram-negative organisms. Overall 30-day mortality rate was 22%(95% CI 12-38).

Conclusions

Two-third of organisms related to CLABSI were gram-negative organisms of which one-third of them are resistant to carbapenem. The mortality rate is high.
THE CHANGE IN EPIDEMIOLOGY, ETIOLOGY, AND ANTIBIOTIC RESISTANCE IN CHILDREN WITH ACUTE PYELONEPHRITIS

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Purpose: This study aimed to analyze the epidemiology, etiology, and changes in antibiotic susceptibility patterns of the first episode of acute pyelonephritis (APN) in children.

Methods: This was a retrospective observational study of children <18 years old, diagnosed and treated for their first febrile APN between 2006 and 2016. Electronic medical records were analyzed and radiologic images re-evaluated.

Results: A total 359 patients fit the inclusion criteria, with 80.0% (n=280) below 12 months old and the median age 5.1 (IQR 3.0-10.5) months old. The male to female ratio was 5.3:1 between ages 0 to 2 months, 2.1:1 between 3 to 5 months; and 1.6:1 between 6 to 11 months old. Beyond 12 months, there was female predominance. Escherichia coli was the leading cause of APN (83.8%) followed by Enterococcus species (6.7%), and Klebsiella pneumoniae (3.6%). During the 11-year period, a significant yearly increase in MDR strains \( (p<0.001) \) and ESBL producers \( (p<0.001) \) was observed. Comparing ESBL vs. non-ESBL producers, there were no differences in the total fever duration, time to defervescence, and admission duration. Recurrence rates in patients without vesicoureteral reflux (VUR) were similar amongst ESBL vs. non-ESBL producers (6.5% vs. 4.7%, \( p=0.602 \)). However, in patients with VUR, ESBL-producers had a higher recurrence rate within six months (75.0% vs. 30.0%, \( p=0.03 \)).

Conclusions: The prevalence of APN remains highest during the first year of life. The proportion of ESBL-producers is significantly increasing. In patients with VUR, APN caused by an ESBL-producer has an increased risk of recurrence within 6 months.
Background and aims

The aim of this study is to describe the epidemiology and patient characteristics associated with multidrug resistant (MDR) Gram-negative bloodstream infections (BSIs) in a hospital-based pediatric population.

Methods

This retrospective study included patients <19 years old with positive blood cultures for Enterobacteriaceae or non-fermentative Gram-negative bacteria collected between January 2014 and April 2016 at a Canadian pediatric tertiary care hospital. MDR organisms were defined by resistance to any third-generation cephalosporin or carbapenem, or any organism likely to derepress AmpC beta lactamase activity. For Pseudomonas, only isolates resistant to ceftazidime were considered MDR.

Results

There were 159 Gram-negative BSIs identified. MDR organisms were present in 41/159 (26%). Enterobacter species accounted for 19/41 MDR BSIs (47%). The cumulative incidence of MDR BSIs was 2.3 episodes/1000 hospital admissions and MDR infection rate was 0.32 episodes/1000 bed days. For patients with MDR BSIs, 31/41 (76%) had received antibiotics in the past 30 days, and 25/41 (61%) had an underlying oncologic diagnosis. For study patients with an oncologic diagnosis, 25/61 (41%) of Gram-negative BSIs were caused by MDR pathogens. The sepsis-related mortality rate was 3/41 (7%) in the MDR group and 4/118 (3%) in the non-MDR group.

Conclusions

MDR pathogens are common in pediatric patients with Gram-negative BSIs. Patients with an oncologic diagnosis are at high risk for MDR Gram-negative BSIs. MDR BSIs have a high sepsis-related mortality rate.
Background: Group B streptococci (GBS) is a conditioned pathogen which plays an important role in newborn infection arising from mother and infant vertical transmission. Recent years, along with the elevating resistant rate to erythromycin and clindamycin, GBS become a troublesome pathogen at the aspect of infection prevention and cure. So, our purpose is to study the antibiotic-resistant rate of GBS in obstetric canal of Late-pregnant women, evaluate the antibiotic-resistant status and finally to give support to the GBS prevention, and curing by proper antibiotics.

Materials/methods: total of 31 pregnant women between 35 to 37 weeks were included, from whom GBS antibiotic sensitivity and drug resistance gene were analyzed.

Results: as many as 21 strains (67.7%) were resistant to erythromycin, while 12(38.7%) to clindamycin, within which 12 strains were cMLS type, clindamycin resistance, while other 9 strains were clindamycin sensitive and all of which were M type confirmed by Double disk diffusion method. Within 12 cMLS type strains, 4 were mef(A) positive, 8 with erm(B), in which 3 with erm(C). Within 9 M type strains, 4 were erm(B) positive, 5 with mef(A) (Table 1, Figur 1).

Conclusions: In our study, the GBS strains show a high erythromycin and clindamycin resistance rate and the mechanisms of drug resistance of our GBS strains are mainly the ribosomal target changes induced by erm(B) and the increased efflux of clindamycin induced by mef(A).

Key words: Streptococcus agalactiae; Pregnant woman; Colonization; Resistance; Resistance mechanism

Table 1 Genetic testing results of different erythromycin resistant strains
<table>
<thead>
<tr>
<th>Resistant phenotype</th>
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<th>Genetic testing results</th>
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<tr>
<td></td>
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</tr>
<tr>
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<td>M</td>
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<td>0</td>
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Figure 1  The Genetic testing results of No. 1–3, 5–30 strains
Background and aims

Bloodstream infections (BSIs) increasingly became an important problem caused by α-haemolytic streptococci including *streptococcus pneumoniae* (*SP*) and *viridans group streptococcus* (*VGS*) in children with high morbidity and mortality. Antimicrobial resistance of streptococci varied in species but were generally quite high.

Methods

We performed a retrospective study of 110 hospitalized children with definite *SP* (74 cases) and *VGS* (36 cases) BSIs from January 2008 to December 2016 by analyzing antimicrobial non-susceptibility profile of *SP* and *VGS* based on various categories including microbe group, time period and place of acquisition.

Results

Compared with *VGS*, patients with BSIs caused by *SP* have a higher resistance to a series of antimicrobials including erythromycin, penicillin and tetracycline except for cefotaxime and levofloxacin. In addition, we also observed a considerably increased non-susceptibility to penicillin in patients with *SP* in 2008-2012 (16.7%) compared to 2013-2016 (50.0%). Furthermore, the analysis of multidrug resistance (MDR) showed a higher rate in *SP* isolates than *VGS* (73.0% vs 63.9%). Considering antimicrobial non-susceptibility in different place of acquisition, we found that there were 78.6% of patients with MDR *SP* in hospital-acquired (HA) BSIs compared to 71.7% in community-acquired (CA). Similarly, a higher rate of MDR *VGS* in HA strains compared to CA strains were observed (71.4% vs 59.0%).

Conclusions

*SP* exhibited a higher antimicrobial resistance to erythromycin, penicillin and tetracycline than *VGS* strains isolated from BSIs in children. Isolates from HA had higher MDR rate than CA in *SP* strains as well as *VGS*. 
Prevalence and characterization of third-generation of cephalosporin resistant Shigella flexneri isolates from Jiangsu Province of China, 2013-2015

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The aim of this study was to assess the prevalence of third-generation cephalosporin resistance and characterize the mechanism of third-generation cephalosporin resistant S. flexneri isolates.

A total of 282 S. flexneri strains, isolated between 2013 and 2015 in Jiangsu Province of China were bacterial identification, serological typing and analyzed for their third-generation of cephalosporin susceptibility. The ESBLs gene TEM, SHV, CTX-M and OXA were amplified and sequenced.

In general, Cefotaxime resistant S. flexneri were 97 strains, the mean resistance rate was 34.4% during the three years from 2013 to 2015. ESBLs gene were demonstrated in 73 isolates, 66(68.0%) strains showed resistance to third-generation of cephalosporins. 32(43.8%) isolates were positive for CTX-M-1 group (17 for CTX-M-55, 4 for CTX-M-3, 1 for CTX-M-15, 3 for CTX-M-79 and 7 for CTX-M-123), 31(42.5%) isolates were positive for CTX-M-9 group (29 for CTX-M-14, 1 for CTX-M-24, 1 for CTX-M-27); 25(34.2%) isolates were found to be positive for TEM-types (21 for TEM-1 and 4 for TEM-1b), 1(1.4%) isolate was positive for SHV-type: SHV-12; none was positive for CTX-M-2 group, CTX-M-8 group and OXA-type.

To the best of our knowledge, this report describes the first identification of ESBLs gene subtypes in Shigella spp: CTX-M-123. What's more, TEM-1, CTX-M-14 and CTX-M-55 appeared to be the dominant ESBLs in these cities. In conclusion, ESBLs play an important role in third-generation cephalosporin resistance in Shigella and the emergence of new ESBLs subtypes in S. flexneri in Jiangsu Province deserves attention.
MULTICENTER STUDY ON THE ANTIBIOTIC SENSITIVITY AND MOLECULAR CHARACTERIZATION OF COMMUNITY-ASSOCIATED STAPHYLOCOCCUS AUREUS IN CHILDREN WITH SKIN AND SOFT TISSUE INFECTION IN CHINA

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Background and aims

To evaluate the antibiotic sensitivity and molecular features of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA) from children with skin and soft tissue infections (SSTIs) in China.

Methods

Prospective community-associated *Staphylococcus aureus* (*S. aureus*) SSTIs surveillance was conducted in 13 hospitals over a 24-month period. Susceptibility to 16 antimicrobials was evaluated using the agar dilution method. Genotypic characteristics of CA-MRSA isolates were tested by SCCmec typing, *spa* typing and MLST.

Results

Overall, 1705 strains of *S. aureus* were isolated and CA-MRSA accounted for 2.6% (44/1705). 96.8% strains were resistant to erythromycin and penicillin, 89.3% to clindamycin, 38.8% to tetracycline, 15.1% to chloramphenicol, 9.6% to gentamicin, 6.2% to ciprofloxacin, 3.6% to trimethoprim/sulfamethoxazole, 2.6% to oxacillin, 1.8% to fusidic acid, 1.7% to rifampin, 1.4% to cefazolin, 1.3% to mupirocin, 1.1% to ceftriaxone and 0.5% to cefixime. None of the *S. aureus* strains were resistant to vancomycin. Two types of SCCmec were detected in CA-MRSA strains, mainly types were SCCmec IV (45.5%) and SCCmec V (54.5%). 13 MLST types (STs) and 15 spa types were detected. The most prevalent MLST was ST121 (40.9%), followed by ST59 (20.5%). Additionally, t437 was predominant, accounting for 40.9%. ST121 strain had 8 spa types, t2086 was the most common type, while ST59 had only 1 spa type, t437. No ST121, ST59 and t437 strains were found in Central and Eastern China.

Conclusions

CA-MRSA infections are rare among Chinese SSTIs children. MRSA strains have diverse genetic backgrounds, with ST121 the predominant clone. Fusidic acid and mupirocin remain effective for topical treatment.
A CROSS-SECTIONAL STUDY IN A SINGLE-CENTER GRADE TWO HOSPITAL REVEALED NON-PCV13 SEROTYPES WERE FREQUENT AMONG STREPTOCOCCUS PNEUMONIAE ISOLATED FROM HOSPITALIZED CHILDREN WITH RESPIRATORY INFECTION

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Objective To investigate the colonization status, serotype distribution and antibiotic resistance profiles of Streptococcus pneumoniae among hospitalized children with respiratory tract infections in grade two hospitals in Western China, and to determine whether it has different geographical features than previously reported. Methods Nasopharyngeal swabs of hospitalized children with respiratory tract infections aged 1 month old ~14 years old was collected from January to December 2015 at the Zhongjiang County hospital in Sichuan, and Streptococcus pneumoniae was isolated. The serum type was detected by capsule swelling experiment to assess the coverage rate of 13 valent pneumococcal conjugate vaccine (PCV13). The sensitivity of 16 antimicrobial agents, such as penicillin, was detected by E-test or disk diffusion method between approximately 50% of isolates randomly selected based on the serum type. Results The nasopharyngeal carriage rate of Streptococcus pneumoniae was 18.4% (199/1082). The common serotype was 19F (14.6%), 19A (10.6%), 34 (10.1%), 6A (9.0%), 23F (7.5%), 6B (7.5%) and 23A(7.0%). The coverage rate of 13-valent pneumococcal conjugate vaccine were 54.8%. All of the isolates were sensitive to penicillin using the parenteral breakpoints, but the sensitive rate was just 9.1% according to the oral breakpoints. The sensitivity rate of amoxycillin/clavulanate was 97%. All of the isolates were sensitive to ceftriaxone, vancomycin, levofloxacin and linezolid. However, all of the isolates were resistance to erythromycin and azithromycin. Conclusions Colonization of streptococcus pneumoniae are noted frequently in the nasopharynx of children with respiratory tract infections in Zhongjiang. Non PCV13 serotypes were common in this region, of which 34 and 23A were more seen. The isolates show a high antimicrobial resistance to oral penicillin,erythromycin and so on, but sensitive to parenteral penicillin, ceftriaxone, etc.

Nasopharyngeal swabs of hospitalized children aged 1 month old ~14 years old was collected from January to December 2015 at the Zhongjiang County hospital in Sichuan, and Streptococcus pneumoniae was isolated. The serum type was detected by capsule swelling experiment. The sensitivity of 16 antimicrobial agents was detected by E-test or disk diffusion method.

The nasopharyngeal carriage rate of Streptococcus pneumoniae was 18.4% (199/1082). The common serotype was 19F (14.6%), 19A (10.6%), 34 (10.1%), 6A (9.0%), 23F (7.5%), 6B (7.5%) and 23A(7.0%). The coverage rate of 13-valent pneumococcal conjugate vaccine were 54.8%. All of the isolates were sensitive to penicillin using the parenteral breakpoints, but the sensitive rate was just 9.1% according to the oral breakpoints. The sensitivity rate of amoxycillin/clavulanate was 97%. All of
the isolates were sensitive to ceftriaxone, vancomycin, levofloxacin and linezolid. However, all of the isolates were resistance to erythromycin and azithromycin.

Colonization of streptococcus pneumoniae are noted frequently in children with respiratory tract infections in Zhongjiang. Non PCV13 serotypes were common in this region, of which 34 and 23A were more seen. The isolates show a high antimicrobial resistance to oral penicillin, erythromycin and so on, but sensitive to parenteral penicillin, ceftriaxone, etc.
NASOPHARYNGEAL CARRIAGE RATE, SEROTYPE DISTRIBUTION, ANTIBIOTIC RESISTANCE PATTERN OF STREPTOCOCCUS PNEUMONIAE ISOLATED FROM HOSPITALIZED CHILDREN WITH LOWER RESPIRATORY TRACT INFECTIONS IN JINAN

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Background and aims

To evaluate the nasopharyngeal carriage rate, serotype distribution, and antibiotic resistance pattern of Streptococcus pneumoniae isolated from children with lower respiratory tract infections in Jinan.

Methods

The clinic data were analyzed in 630 children patients from September in 2014 to December in 2014 and August in 2015 to April in 2016 in Qilu Children’s Hospital of Shandong University. The serotype was determined by Quellung reaction. The antibiotic susceptibility was tested by E-test and disc diffusion method.

Results

The nasopharyngeal carriage rate of Streptococcus pneumoniae in children with lower airway infection was 14.4% (91/630). The common serotypes of Streptococcus pneumoniae in Jinan were serotype 19F (32.97%), 14 (10.99%), 19A (9.89%), 6A (8.80%), 6B (7.69%) and 15C (6.95%), these serotypes account 78.01% of all the strains. The coverage of 7 pneumococcal conjugate vaccine (PCV7), 10 pneumococcal conjugate vaccine (PCV10), 13 pneumococcal conjugate vaccine (PCV13) were 58.24%, 59.34%, 78.02%, respectively. All of the isolates were sensitive to penicillin, levofloxacin and vancomycin. No isolate was sensitive to erythromycin. The susceptibility rate of Streptococcus pneumoniae to imipenem, cefuroxime, cefotaxime, amoxicillin clavulanic acid, tetracycline, trimethoprim/ sulfameth-oxazole, telithromycin, chloromycetin were 52%, 26%, 69%, 91%, 3%, 24%, 94% and 96%, respectively. The multi-drug resistance rate was 77.78%, and the most common resistance pattern was erythromycin- tetracycline- trimethoprim/ sulfameth-oxazole (73.33%).

Conclusions

The nasopharyngeal carriage rate of Streptococcus pneumoniae in children with lower airway infection lower than other reaches. The common serotypes of Streptococcus pneumoniae were serotype 19F, 14, 19A, 6A, 6B, 15C. PCV13 may be more useful to protect the children in Jinan because of main status of serotype 19A.
ASYMPTOMATIC MALARIA AND HAEMATOLOGIC PARAMETERS IN SCHOOL CHILDREN IN MALARIA ENDEMIC REGION OF NIGERIA

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Background and aims

Background: Malaria is a blood vector borne disease with high morbidity and mortality in children in sub-Saharan Africa.

Aim: To examine some haematological parameters of well-nourished healthy children with asymptomatic malaria and those with malaria negative smear.

Methods

Methods: Study participants were school children aged 2 – 9 years recruited by multi-staged sampling in nursery and primary school in Edo South malaria endemic region of Nigeria. Prior to this study malaria was said to be holoendemic. Malaria diagnosis was by microscopy and the haematologic parameters analyses were performed following standard protocols.

Results

Results: A total 176 well-nourished healthy children aged 2 – 9 years (75 with asymptomatic malaria parasitaemia and 101 malaria negative) were recruited in the study. Mean monocyte count of 2.30 ± 1.0 X 10⁹ cells/L of asymptomatic malaria parasitaemic children was significantly higher than 1.35 ± 0.5 X 10⁹ cells/L observed in those with no malaria (p = 0.00). Platelet count was significantly lower (asymptomatic 210.20 ± 47.60 X 10⁹ cells/L Vs no malaria parasite 230.50 ± 57.20 X 10⁹ cells/L) (p = 0.01). There was no significant difference in packed cell volume between the two groups. Spleen rate observed in the children was 16.5%. Spleen length 2.7 ± 0.8 (2 – 5) cm. The haematologic parameters did not depend on presence nor spleen length on both arms.

Conclusions

Conclusion: The finding showed that malaria is mesoendemic in the study locale. Monocyte and platelet count could be useful parameter for identification of asymptomatic malaria parasitaemia.
PREVENTION OF HOSPITAL TRANSMISSION OF HEPATITIS A DURING RECENT OUTBREAK IN SOUTH WALES

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Background and aims

In the June of 2016 Public Health Wales declared an outbreak of Hepatitis A. Outbreak involved 18 patients, 12 of whom were Paediatric cases.

In the beginning of the outbreak, we admitted four Paediatric cases at different intervals of time.

Admissions were for diagnostic purposes up to around the time the outbreak was declared. On each admission, we adhered to infection control procedures.

Methods

The children were accommodated in cubicles each with separate facilities.

Access by the children to the kitchen and communal play areas like our playroom was restricted.

We adhered strictly to the visiting schedules, with adult visitors restricted to two per patient and only at certain periods of the day. No children (including siblings) was allowed visitation during the admission. We reinforced handwashing practices among the families.

There was a designated nurse per shift looking after only the children in these cubicles. A sign was left on the door reading “Barrier”.

When accessing the cubicles, hospital staff performed strict barrier dressing with aprons, gloves and decontaminants. Medical notes and observation charts were left outside the room on each contact.

All reusable medical equipment were decontaminated after use.

Family members and close contacts were offered HAV vaccinations through the public health department following notification and confirmation.

The cubicles underwent deep cleanses and decontamination after discharge.

Results

There was no hospital acquired HAV infection.

Conclusions
Person to person transmission is the commonest mode of spread of HAV infection, it is important to adhere strictly to infection control procedures to prevent onward transmission.
Escherichia coli sequence type (ST) 131 has emerged as a higher virulent and multidrug-resistant pathogen worldwide. This study aimed to identify the prevalence and characteristics of E. coli ST131 isolated from Korean children with bacteremia at a single center over 16 years. We retrospectively reviewed culture-proven E. coli bacteremia cases of children aged ≤18 years between 2000 and 2015. E. coli isolates were analyzed using multilocus sequence typing, fimH typing, and CTX-M typing. Among 177 children with E. coli bacteremia, a total of 21 (11.9%) ST131 isolates and 37 (20.9%) extended spectrum ß-lactamase (ESBL) producing E. coli were identified. Nineteen (90.5%) isolates of ST131 E. coli had the fimH gene, of which three were assigned to subclone H30. There was a significant difference in prevalence of ESBL production between ST131 (n=8, 38.1%) and non-ST131 (n=29, 18.6%) isolates (P=0.039). Five ESBL-producing ST131 E. coli isolates had the blaCTX-M gene: 2 for CTX-M-14, 2 for CTX-M-15, and 1 for both CTX-M-14 and CTX-M-15. ST131 isolates had higher resistance rates to piperacillin/tazobactam (38.5% vs. 10.0%), cefotaxime (38.1% vs. 16.7%), amikacin (23.8% vs. 1.9%), and gentamicin (52.4% vs. 28.8%) than non-ST131 isolates (P<0.05). There were no significant differences in mortality or shock rate between patients infected with ST131 versus non-ST131 clones (5.6% vs. 9.8%, 11.1% vs. 19.7% respectively; P>0.05). Prevalence of ST131 E. coli causing bacteremia in children was not different from that in adults or that causing UTI in children in Korea. However, because ST131 clones are more likely to be ESBL-producing and more resistant to empirical antibiotics typically used in sepsis than are non-ST131 clones, surveillance for the prevalence of ST131 and its drug resistance should be continued.
EFFECT OF CO-TRANSPLANTATION OF UNRELATED CORD BLOOD AND NON-PLATELET RNA-CONTAINING PARTICLES ON HEMATOPOIETIC RECONSTITUTION

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Background and aims

To investigate the effects of co-transplantation of unrelated cord blood (UCB) and non-platelet RNA-containing particles (NPRCP) on hematopoietic reconstitution in patients with nonmalignant disease.

Methods

6 patients with nonmalignant disease treated who underwent UCBT and 5 patients with nonmalignant disease treated who underwent UCBT and NPRCP. The reconstitution of hematopoietic function, fever period, abnormal time of C reactive protein (CRP), times and units of platelet transfusion were monitored.

Results

(1) Median time for neutrophil engraftment was 14 (range 12-19) and 16.5 days (range 12-19) after UCB&NPRCP and UCB transplants, respectively. (2) Median time for platelet engraftment was 23 (range 16-74) and 41.5 days (range 30-124) after UCB&NPRCP and UCB transplants, respectively. (3) Median time of fever period was 5 (range 2-10) and 4.5 days (range 0-10) after UCB&NPRCP and UCB transplants, respectively. (4) Median abnormal time of CRP was 12 (range 0-14) and 13 days (range 1-19) after UCB&NPRCP and UCB transplants, respectively. (5) Median times of platelet transfusion was 12 (range 0-14) and 13 days (range 1-19) after UCB&NPRCP and UCB transplants, respectively. (6) Median units of platelet transfusion was 12 (range 0-14) and 13 days (range 1-19) after UCB&NPRCP and UCB transplants, respectively.

Conclusions

The co-transplantation of UCB and NPRCP can promote the time of platelet engraftment, reduce the time and unit of platelet transfusion. But the co-transplantation cannot reduce the incidence of infection by neutrophil engraftment.
HUCMSCS INHIBIT BACTERIAL GROWTH AND ALLEVIATE ANTIBIOTIC RESISTANCE IN NEONATAL IRPA INFECTION
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Background: Human Umbilical Cord Mesenchymal Stem Cells (hUCMSCs) are safe and convenient source of Mesenchymal Stem Cells (MSCs), and have showed beneficial effects in neonatal infection and sepsis animal models. However, the factors leading to improved outcomes are still unclear.

Objective: The aim of this study is to investigate antibacterial effect and regulation of antimicrobial resistance of hUCMSCs.

Methods and Results: To test the hypothesis that hUCMSCs possessed direct antimicrobial properties against bacteria and regulated antibiotic resistance, we incubated imipenem-resistant pseudomonas aeruginosa (IRPA) separated from neonates with hUCMSCs as well as its culture medium, and found hUCMSCs and their culture medium stimulated with IRPA possessed marked inhibition of bacterial growth which is mediated partly by secretion of antibacterial peptides (Human β-Defensin-2 (HBD-2) and Cathelicidin/LL-37). IRPA from some neonatal samples became sensitive to imipenem after incubation with hUCMSCs (Table 1). Further studies revealed culture medium of hUCMSCs could delay antibiotic resistant PA formation induced by sub-inhibitory concentration of imipenem and improve outer membrane protein OprD2 mRNA expression, which could not explained by production of antimicrobial peptides.

Table 1. Number of IRPA samples from neonates before and after incubation with hUCMSCs

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Number of IRPA Samples before incubation with hUCMSCs</th>
<th>Number of IRPA Samples after incubation with hUCMSCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sputum</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Tracheal incubation</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Eye discharge</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gastric contents</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Skin pus</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>BALF</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>12</td>
</tr>
</tbody>
</table>

Conclusion: We conclude that human umbilical cord mesenchymal stem cells can inhibit bacterial growth and alleviate antibiotic resistance which is mediated partly by secretion of cathelicidin LL-37 and HBD-2 and up-regulation of OprD2. These studies provide insights into a possible innovative and invaluable therapy for neonatal infection and antibiotic resistance.
Background and aims

BACKGROUND: Emerging Acinetobacter infections and spread of multidrug-resistant strains have become therapeutic challenge in management of critically ill & hospitalized children. These organisms are associated with greater risk of mortality and prolonged hospital stay.

AIMS: To study the epidemiology, clinical profile, antimicrobial sensitivity, and outcome of bacteremia caused by Acinetobacter species.

Methods

It is a retrospective analysis of acinetobacter isolates from clinical specimens in children between 0-18yrs from Jan 2010 to May 2017 done at Manipal Hospital, Bangalore, India.

Results

Of 315 Acinetobacter isolates, 203(64.4%) were Acinetobacter baumannii. Commonest age group was 0-1 months(38.2%). 68.2% were male children. Tracheal aspirate (42%) and blood (35%) were most common sites of infection. 57.50% isolates were from ICU. 58.20% patients were ventilated. Fever(43%) and breathlessness(16%) were the most common symptoms. Among acinetobacter baumannii strains, resistance for cefepime and imipenem were seen in 55%, ciprofloxacin and ceftazidime 54%, meropenem 53%, piperacillin + tazobactem 52%. Resistance to tigecycline was seen in 7% of isolates. In non acinetobacter b strains, resistance to gentaclin, ceftazidime was seen in 80%. No resistance was seen to polymixin B and colistin.

Conclusions

Infection with acinetobacter baumannii have been encountered frequently among hospitalised patients. Tracheal aspirate remain common site of infection. Resistance to commonly used affordable oral antibiotics makes the treatment expensive in resource poor countries. Identifying acinetobacter strains on culture, regular local antibiogram will help clinician to know the pattern of sensitivity for better treatment and outcome. Strict adherence to infection control may help to reduce the burden of infection.
ANTIMICROBIAL SUSCEPTIBILITY AND FLUCTUATION OF CLONAL COMPLEX OF SEROGRUP 6 STREPTOCOCCUS PNEUMONIAE STRAINS DURING 1997-2016 COLLECTED FROM CHILDREN IN BEIJING, CHINA

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Background and aims

Serogroup 6 Streptococcus pneumoniae is very popular in China. The aim of this study was to detect the antimicrobial susceptibility pattern and the clonal complex characteristics of serogroup 6 S. pneumoniae strains collected from children in Beijing during 1997~2016.

Methods

Serotypes were determined using Quellung reaction with antisera. Susceptibility of the isolates to 11 antibiotics was tested using the E-test method or disc diffusion. Sequence types (STs) were assigned with multilocus sequence typing.

Results

A total of 250 strains were included, and the rate of serotype 6A, 6B, 6C and 6D was 55.2% (138/250), 30.0% (75/250), 12.8% (32/250) and 2.0% (5/250) respectively. All of the isolates were susceptible to levofloxacin and vancomycin, and no resistant strains was found against amoxycillin-clavulanic acid, ceftriaxone or imipenem. Resistance rate to erythromycin was 96.4% (241/250), and 236 cases expressed high MIC (>256 mg/L). Eighty-two distinct STs assigned to 13 CCs and 28 singletons were identified. CC982 was the most prevalent CC in serotype 6A, accounting for 30.4% (42/138), followed by CC9789 (15.9%, 22/138) and CC3173 (15.2%, 21/138). In serotype 6B strains, CC90 and CC4542 were the most common, accounting for 25.3% (19/75) and 14.7% (11/75) respectively. In the study period, the percentage of CC982, CC4542, CC4536 showing high susceptibility rate to penicillin and cefuroxime decreased, and proportion of CC3173, CC9789, CC855 and CC902 with high non-susceptibility to these two antibiotics increased.

Conclusions

Further long-term surveillance of this and other serotypes of pneumococci are necessary to monitor ST prevalence and associated antimicrobial resistance of this important human pathogen.
Background and aims

Moraxella catarrhalis is one of the important pathogens causing infectious diseases. The aim of the study is to detect the antimicrobial susceptibility and β-lactamase activity characteristics of Moraxella catarrhalis isolates collected from two county hospitals in China.

Methods

Moraxella catarrhalis strains were isolated from the swab specimens. Antibiotic susceptibility against 11 antimicrobials were tested on the isolated strains using the E-test method or disc diffusion. Detection of β-lactamase activity was determined by the chromogenic cephalosporin nitrocefin.

Results

The yield rates of Moraxella catarrhalis in these two hospitals were 7.12% and 9.58% (Zhongjiang County, 77/1082 cases; Youyang County, 101/1054 cases). All of the isolates were susceptible to amoxicillin–clavulanic acid. The susceptibility rate to meropenem was 100% according to EUCAST, as there was no breakpoints listed in CLSI and BSAC. The non-susceptibility rate to sulfamethoxazole–trimethoprim in the two counties showed significant difference no matter which judgment criteria was used, and isolates in Zhongjiang were more sensitive than strains in Youyang (Fisher, P<0.05). According to CLSI, the total non-susceptibility rate to erythromycin was 70.8% (Zhongjiang County, 79.2%; Youyang County, 64.3%), and the rate reached 92.1% (Zhongjiang County, 90.9%; Youyang County, 93.1%) on the basis of EUCAST or BSAC. The total positive rate of β-lactamase was 99.4% (177/178 cases), as it was 99.0% (100/101 cases) in Youyang and 100% (77/77 cases) in Zhongjiang.

Conclusions

Almost all of the Moraxella catarrhalis isolates produce β-lactamase. The isolates showed poor susceptibility to ampicillin and erythromycin, and high susceptibility rate to the third- and fourth-generation cephalosporins and amoxicillin–clavulanic.
MOLECULAR MECHANISMS IN THE CHANGING PARADIGM OF ANTIBIOTIC RESISTANCE IN INDIA
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Background and aims

Integrons are mobile DNA elements that capture and express genes found in their environment as part of small mobile elements, termed gene cassettes. The aim of this study was to gain insight on the distribution of genes encoding class 1, 2 and 3 integrons among diarrheagenic E.coli isolates and gene cassettes associated with them. To determine antibiotic resistant genes and to determine the single nucleotide polymorphism (SNP) in gyrA and parC in quinolone resistance determining regions from children up to five years of age from Delhi, India. An attempt was also made to create a 3D model and find a suitable inhibitor using an in silico study.

Methods

A total of 120 E.coli isolates including 80 diarrheagenic E.coli (cases) and 40 healthy isolates (controls) were recruited in this study. Fresh stool samples were collected and identified as E.coli using biochemical tests. DNA was used for conventional PCR for identification of genes associated with class 1, 2 and 3 integron, gene cassettes, antibiotic resistance genes and SNP detection. P value less than 0.05 was considered significant.

Results

Class 1 integron was identified in 43 and 9 isolates while 12 and 7 isolates harbored class 2 integron in diarrheagenic cases and healthy controls respectively and no class 3 integrons were detected in any of the isolate. 9 and 3 isolates showed co existence of class 1 and class 2 integrons in diarrheagenic cases and healthy controls.

Conclusions

Comparative modeling is a useful tool in bioinformatics to predict the three dimensional (3D) structure of an unknown protein.
Integrons are genetic elements that can collect several resistance genes in the form of gene cassettes. The main aim of this study was to investigate the distribution of integrons in multidrug resistant diarrheagenic *E. coli* isolates, to analyze the possible relationship between the antibiotic resistance and integrons and their genetic analysis using various bioinformatics tools.

80 diarrheagenic *E. coli* strains were isolated from children with diarrhea and examined for the presence of class 1, 2 and 3 integrons by real time PCR after performing Antibiotic susceptibility assay. An attempt was made to create a 3D model and find a suitable inhibitor using an in silico study. Docking was performed using various tools.

Class 1 & 2 integron were identified in 76.25% and 26.25% isolates respectively. Integrons were significantly associated with resistance to certain antibiotics. MDR character appeared to be governed by class1 integrons carring six different arrays of genes (*aadA1, aadB, aadAV, dhfrV, dhfrXII, and dhfrXVII*).

Integrons plays an important role in transmission of multidrug resistance. This study identifies amino acid residues crucial to drug and inhibitor interactions that provide useful insights into the identification of new antibacterial compounds and also help in the design of new inhibitors.
Background and aims

Background: Tigecycline has a wide spectrum antimicrobial activity including MDR and XDR nosocomial Gram-negative bacteria. Although its pediatric use has not been approved, clinicians are sometimes obligated to choose tigecycline as salvage therapy.

Aim: In this study, we present our clinical experience regarding tigecycline use in children.

Methods

Study Design: Retrospective cross-sectional study.

Methods: This was a retrospective study of children who had been given tigecycline therapy at least 48 consecutive hours of duration in the pediatric departments of two tertiary centers from January 2011 to March 2016.

Results

Results: Twenty four patients (13 female, 54.2%) with median age of 96 months (1-192) were enrolled. Tigecycline was started for VAP (n=10, 41.7%), BSI (n=7, 29.2%), catheter related infection (n=1, 4.2%), cSSSI (n=1, 4.2%) and empirically (n=5, 20.8%). The most common isolated pathogen was Acinetobacter baumannii (n=13, 54.2%). Other pathogens were Klebsiella spp (n=4, 16.6%), MRSA (n=1, 42%) and Leptospira spp. (n=1, 4.2%). All of the patients had tigecycline combination therapy. The most common combination was tigecycline + colistin (n=10, 41.7%). Two patients (8.3%) had mild adverse events. The mortality rate was 45.8%. There was negative correlation between the age of patients and mortality rate (p=0.006).

Conclusions

Conclusion: Tigecycline may be used in critically ill children as salvage therapy with considerably mild side effects.

Abbreviations: BSI; blood stream infection, cSSSI; complicated skin soft tissue infection, MDR; multi-drug resistant, MRSA; methicillin resistant Staphylococcus aureus, XDR; extended drug resistant, VAP; ventilator associated pneumonia.
RESISTANT GRAM NEGATIVE INFECTIONS IN A PEDIATRIC INTENSIVE CARE UNIT: MDR OR XDR?

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Background and aims

Resistant gram negative bacterial infections (GNBIs) are major threats for intensive care units. The aim of this study was to determine the characteristics of multidrug-resistant (MDR) and extended drug resistant (XDR) GNBIs in a pediatric intensive care unit (PICU) of an university hospital.

Methods

Medical records of the patients with MDR and XDR GNBIs in PICU between 2011-2015 were evaluated retrospectively.

Results

79 patients with median age of 22 months (1-205) were detected to have 130 episodes of GNBIs [MDR (n=59, 45.3%) and XDR (n=36, 27.6%)]. Ventilator-associated pneumonia (60%) and bloodstream infections (29.2%) constituted the majority. The first three GNB were P aeruginosa (38.5%), K pneumoniae (24.6%) and A baumannii (21.5%). 58 patients (73.4%) had chronic illnesses. The most preferred antibiotic combination was meropenem-amikacin (26.2%). Median length of PICU stay was 38 days. Mortality occured in 9 patients. The length of hospital stay >15 days prior to PICU admission and the median length of PICU stay were significantly higher among XDR-GNBIs. Empirical use of carbapenems, aminoglycosides and fluoroquinolones; the presence of TPN and history of GNBIs prior to PICU admission were significantly more common among XDR-GNBIs. A baumannii isolates were significantly more prone to be XDR. Overall case fatality rate was significantly higher among XDR-GNBIs. Previous GNBIs and presence of A baumannii were found to be independent risk factors for the development of XDR-GNBIs.

Conclusions

In order to choose proper empirical therapy, clinicians must be aware of bacterial habitat and resistant patterns of their wards. Besides, more studies should be focused on PICUs.
GENETIC ANALYSIS OF STREPTOCOCCUS AGALACTIAE STRAINS ISOLATED FROM NEONATES AND OBSTETRICAL DEPARTMENT
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Background
Group B streptococcus (GBS) was one of the major causes of invasive diseases in neonates and pregnant women by leading higher mortality and longer hospital stay. For neonates, it could induce severe sepsis, meningitis, pneumonia and so on. For the pregnant women, it mainly caused premature rupture of fetal membranes and severe infections. However, the related studies were insufficiently attached importance and enough attention in our country. Due to the passive influence to the neonates, we aimed at analyzing the serotyping, antimicrobial susceptibility testing, macrolide resistance phenotype and genotype for further nation for guiding clinical drugs administration and further definition for GBS.

Methods
We collected the 100 GBS strains from 2008 to 2015 in Shenzhen people’s hospital. All the isolates were detected by antimicrobial susceptibility test, capsular serotyping, multiplex Polymerase Chain Reaction (PCR) to analyze their antimicrobial susceptibility, serotype and virulence-associated genes. In the study described here we performed pulsed-field gel electrophoresis (PFGE) of chromosomal DNAs from a collection of GBS isolates to investigate the epidemiology of GBS infections.

Results
The resistance of the obstetrical group to erythromycin (71.20%) was associated with a constitutive resistance to clindamycin (49.20%) and with an inducible clindamycin resistance in three cases (all possessing the erm (B) gene). The resistance of Macrolide were associated with ermB (22.92%) and mefAE (29.17%). Resistance to tetracycline were associated with tetM (69.81%) and tetO (16.98%). In neonatology group, the resistance of erythromycin was 87.8% and the clindamycin was 85.4%. And 55.56% of them was associated with ermB. While the resistance of the tetracycline was 95.10% and their resistance gene were TetO (25.64%) and TetO + TetM (58.97%).

The strains of neonates were mainly oriented by serotype III (63.41%), while the pregnant women were about serotype Ia (28.33%), serotype Ib (36.67%) and serotype III (18.33%). The main virulence-associated genes were hylB, scpB, lmb in both groups. We found that the neonates and the obstetrics had no homology by pulsed-field gel electrophoresis.

Conclusion
All the GBS isolates were sensitive to penicillin, so the pregnant women and neonates who were infected by GBS could choose penicillin. People who were allergic to penicillin could choose levofloxacin and vancomycin, in which levofloxacin was prohibited in neonates. The erythromycin and clindamycin are not recommended because of their antibiotic resistance. The main serotype of neonates was serotype III, while the obstetrics was serotype Ib and Ia. The main virulence-associated genes were hylB, scpB, lmb. The relationship among the neonates and the obstetrics was heterogeneous.
THE ANTIBACTERIAL MECHANISM OF PLANTARICINS EF AGAINST STAPHYLOCOCCUS AUREUS

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Background and aims

Staphylococcus aureus is an important human pathogen that often causes serious clinical infection. In recent years, the developing of antibiotic resistance have posed big challenges to clinical treatment of Staphylococcus aureus infection. Bacteriocin which is different from antibiotic and preservative have been extensively used in animal and food industry, however except for the application in clinical treatment.

Bacteriocin, as a natural and antibacterial agent, is becoming the research focus. Bacteriocin secreted by Lactobacillus plantarum CMCC-P0002 separated from Bifico, a kind of biological agent, could significantly inhibit Staphylococcus aureus(including drug-resistant strains). In this proposal, we aim to investigate the antibacterial activity of the bacteriocin against Staphylococcus aureus.

Methods

The inhibition zone test was used to detect the antibacterial activity of the supernatant of Lactobacillus plantarum CMCC-P0002. The antibacterial agent in the supernatant is supposed to be bacteriocin by heating, catalase and different pH treatments. Then, genome sequencing and gene knockout were used to identify the bacteriocin and its antibacterial activity.

Results

From the genomic data, we identify two genes, plnE and plnF, encoding plantaricin PlnE and PlnF respectively in Lactobacillus plantarum CMCC-P0002. And they contribute to the antibacterial activity of the supernatant of Lactobacillus plantarum CMCC-P0002.

Conclusions

By secreting plantaricin PlnE and PlnF, Lactobacillus plantarum CMCC-P0002 can inhibit many pathogen including Staphylococcus aureus. This study can provide the new strategy for the clinical treatment of Staphylococcus aureus infection and contribute to the application of bacteriocin in clinical treatment.
The Study of Phenotypes and Genotypes of Escherichia Coli Producing Extended-Spectrum β-lactamases from Children Patients in Taiyuan

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Background and aims

To investigate the phenotypes and genotypes of Escherichia. coli producing ESBLs isolated from children patients in Taiyuan in 2015.

Methods

The drug resistance of 28 Escherichia. coli isolates was measured by using K-B method. ESBL genotypes were analyzed by PCR.

Results

ALL strains were susceptible to imipenem, meropenem and sulperazone. The resistance rate of ESBLs-producing E. coli strains to cefuroxime, cefotaxime, cefoperazone, ceftriaxone and cefepime was 100%. The resistance rates to ceftazidime, ceftizoxime and aztreonam were 67.86%, 89.29%, 96.43% respectively. Totally, the ESBL genotypes of 27 strains were confirmed in the study, 7 of which carried only one type of ESBLs, including CTX-M(4 strains) and TEM(3 strains). 15 Escherichia. coli strains carried two different ESBLs. 5 isolates carried CTX-M, TEM and SHV together.

Conclusions

ESBLs-producing Escherichia. coli isolated from Shanxi Children’s Hospital are highly drug-resistant. CTX-M was the major genotype, and most of the isolates produced two or three ESBLs together.
ANALYSIS ON RESPIRATORY TRACT PATHOGEN OF SEVERE COMMUNITY-ACQUIRED PNEUMONIA IN 150 CHILDREN IN GUIYANG

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Background and aims

To understand the pathogen distribution characteristics of severe community-acquired pneumonia (SCAP) and bacterial resistance.

Methods

Using the medical records, clinical data of 150 children with SCAP and hospitalized in Department of Respiratory and Critical Care Medicine of Guangzhou Children’s Hospital from February 2015 to February 2016 were collected. Secretions of lower respiratory tract of these children were sampled by taking bronchoalveolar lavage fluid with bronchoscope or by nasotracheal intubation.

Results

(1) 132 children with SCAP were examined as positive in pathogen, with positive rate of 88.00% (132/150), including 61 cases of virus, 46 cases of bacteria and 43 cases of atypical pathogens, accounting for 40.15%, 31.82% and 28.03% respectively; (2) The most common virus infections were syncytiotial virus (RSV), human bocavirus (HB0V) and adenovirus (ADV), with detection rates of 40.98% (25/61), 18.03% (11/61) and 16.39% (10/61) respectively, and HBoV infection was mainly occurred in summer and autumn;

Conclusions

(1) There’re great varieties of pathogens for children SCAP, which involve virus, bacteria and mycoplasma pneumonia, with high infection rate of virus-bacteria mixed infection, hence, it is of great significance to keep abreast of pathogens of children SCAP. (2) RSV, HB0V and ADV are the major viral pathogens of hospitalized children with SCAP in Guangzhou region.(3) Streptococcus pneumonia, staphylococcus aureus, Escherichia coli and Klebsiella pneumonia are major bacterial pathogens for these SCAP children in Guangzhou.
SURELLANCE OF CLINICAL BACTERIAL ISOLATES AND BACTERIAL RESISTANCE IN PAEDIATRIC CLINIC FROM 2003 TO 2015

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Background and aims

To investigate the common pathogens of isolate and bacterial resistance from a paediatric clinic in Beijing Children's Hospital.

Methods

All the bacterial isolates from 2003 to 2015 were analyzed in our hospital. Antimicrobial susceptibility was determined by disk diffusion method and Phoenix 100 microbiological system. Results were analyzed according to the guidelines of CLSI(2014).

Results

In total 39,748, Streptococcus pneumoniae, Staphylococcus aureus and coagulase-negative Staphylococci (CNS) were common pathogens of gram-positive bacteria. Escherichia coli, Pseudomonas aeruginosa and Klebsiella spp. were the prominent pathogens of gram-negative bacteria. The penicillin non-susceptible Streptococcus pneumoniae (PNSP) accounted for 50.2%. Methicillin-resistant strains in S. aureus(MRSA)and coagulase negative Staphylococcus(MRCNS)accounted for an average of 20.6% and 87.8%, respectively. MRSA has risen from 11.1% in 2009 to 29.8% in 2015. Vancomycin-resistant Streptococcus pneumoniae, Staphylococcus aureus and CNS were not found. Vancomycin resistant strains of Enterococcus faeciun were 0.3%. The strains of Enterococcus spp were still highly susceptible to Vancomycin and Linezolid. Among Gram-negative bacilli, extended-spectrum β-lactamase stains (ESBLS) accounted for 65.1%~76.9% of Escherichia coli and 73.9%-80.0% of Klebsiella pneumoniae. The carbapenems resistance isolates of Escherichia coli, Klebsiella pneumoniae were found from 2010. To 2014 i, the resistance rate of Escherichia coli to imipenem and meropenem has been over 7%, and the resistance rate of Klebsiella pneumoniae to imipenem and meropenem has been over 20%.

Conclusions

MRSA and the carbapenems resistance isolates of Escherichia coli, Klebsiella pneumoniae and Acinetobacter baumanii are growing. The disseminated drug resistant strains in paediatric poses a serious threat to clinical practice and implies the importance of strengthening infection control.
A SURVEILLANCE OF CARBAPENEMASE-PRODUCING KLEBSIELLA PNEUMONIAE REVEALS INCREASED PREDOMINANCE OF NDM-1 AND EPIDEMIOLOGY OF CARBAPENEM-RESISTANT BLOODSTREAM INFECTIONS IN A CHINESE CHILDREN'S HOSPITAL

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Background and aims

To characterize CPM-non-susceptible K. pneumoniae and carbapenemase produced by these strains isolated from Beijing Children’s Hospital based on a five-year surveillance.

Methods

The Minimal Inhibition Concentration values for 15 antibiotics were assessed using the Phonix100 compact system. PCR amplification and DNA sequencing were used to detect genes encoding carbapenemases. The Clinical and Laboratory Standards Institute (CLSI) 2014 criteria for MICs were applied to classify isolates as susceptible, intermediate or resistant. For colistin, the results were interpreted in accordance with European Committee on Antimicrobial Susceptibility Testing (EUCAST) clinical breakpoints (version 6.0). Data were analyzed using WHONET 5.6 software recommended by the World Health Organization.

Results

In total, 179 strains of CPM-non-susceptible K. pneumoniae were isolated from January, 2010 to December, 2014. The rates of non-susceptible to imipenem and meropenem were 95.0% and 95.6%, respectively. In the 179 strains, 95 (53.1%) strains carried the blaIMP gene, and IMP-4 and IMP-8 were detected in 92 (96.8%) and 3 (3.2%) IMP-producing isolates, respectively. 65 (36.3%) strains carried the blaNDM-1 gene. 6 (3.4%) strains carried the blaKPC gene, and KPC-2 were detected in six KPC-producing isolates. In addition, New Delhi-Metallo-1 (NDM-1) producing isolates increased from 7.1% to 63.0% in five years and IMP-4 producing isolates decreased from 75% to 28.3% (Table 1). During the study period, 164 patients with BSIs due to Klebsiella pneumoniae were observed, of which 52 (31.7%) were caused by CRKp strains.

Conclusions

In our study, the majority of patients received an intravascular catheter, and almost all patients displayed one or more comorbidities.
DISTRIBUTION AND ANALYSIS OF MULTIDRUG-RESISTANT BACTERIA IN ADMITTED CHILDREN IN QINGDAO

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Background and aims

To investigate the distribution and trend of multidrug-resistant bacteria in children admitted in hospitals in Qingdao, and to analyze the drug resistance of multiple drug-resistant bacteria.

Methods

The multidrug-resistant bacteria isolated from inpatient children from three hospitals in Qingdao were analyzed retrospectively from 2013 to 2015, and their distribution and drug resistance were analyzed statistically.

Results

A total of 469 pathogens were isolated from pediatric department of hospitals in Qingdao, including 357 strains of multiple resistant strains, 208 strains of Gram-positive bacteria, 145 strains of Gram-negative bacteria and 4 strains of fungi. The most common multidrug-resistant strains were multiple resistant coagulase-negative staphylococci (MRCNS), followed by ESBLs-producing Escherichia coli, methicillin-resistant Staphylococcus aureus (MRSA). From 2013 to 2015, methicillin-resistant Staphylococcus aureus (MRSA) increased from 3.09% to 24.73%, ESBLs-producing Escherichia coli increased from 6.18% to 21.50%, HLAR increased from 1.03% to 6.45%, and the detection rate of ESBLs producing Lepidoma pneumoniae, Enterobacter cloacae and Acinetobacter baumannii was decreased year by year. The multidrug-resistant bacteria detected in the general pediatric department accounted for 40.89% of the total resistant bacteria, 24.64% in the blood pediatrics and 34.47% in the neonatal department.

Conclusions

From 2013 to 2015, the multidrug-resistant bacteria in the hospitalized children were mainly Gram-positive bacteria and methicillin-resistant Staphylococcus aureus (MRSA), producing ESBLs pneumoniae, Enterobacter cloacae, Acinetobacter baumannii showed a declining trend year by year.
STUDY ON CLINICAL FEATURES OF CHILDREN INFECTED SASX GENE-POSITIVE METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

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Background and aims

Methicillin-resistant staphylococcus aureus (MRSA) has long been known as important human pathogen. This study aims to investigate the prevalence of a novel cell wall-anchored protein gene, sasX, and to obtain the clinical features of children infected sasX gene-positive MRSA.

Methods

A total of 37 nonduplicate MRSA clinical isolates were collected from Children’s Hospital of Fudan University from March 2009 to November 2011.

Results

The sasX gene was detected in 3 (8.1%) MRSA isolates. All of sasX gene-positive MRSA isolates exhibited resistance to β-lactamase antibiotics, Erythromycin and Clindamycin, and approximately 67% of the strains were non-sensitive to Gentamicin, sulfamethoxazole and Levofloxacin. The susceptibility rates for Fosfomycin, Rifampicin, Teicoplanin, Linezolid, Vancomycin were 100%, which provided antibiotic treatment options for MRSA infections. The three cases of sasX gene-positive MRSA infections were all male, aged 0.53 months, 86 months, 85 months. In clinical performance, including two cases with fever, heat peaks was 38.3 °C, 39.2 °C, and thermal process was 4 days, 5 days; In treatment and prognosis aspects, 1 patient was left breast inflammation and abscess formation, we gave him abscess incision and drainage and anti-infection therapy, then he got better, the other two cases were all car accident injuries, we gave them debridement, surgical exploration repair surgery, as well as anti-infective therapy, then their condition improved.

Conclusions

This study indicated that the prevalence of the sasX gene in the MRSA isolates from children was relatively low. Furthermore, the sasX gene might be related to infection invasiveness, and sasX gene-positive MRSA isolates exhibited high antibiotics resistance rate.
ANTIBIOTICS RESISTANCE OF HELICOBACTER PYLORI IN CHILDREN WITH UPPER GASTROINTESTINAL SYMPTOMS IN HANGZHOU, CHINA

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Background and aims

The decreasing eradication rate of Helicobacter pylori is mainly because of the progressive increase of its resistance to antibiotics. Studies on antimicrobial susceptibility of H. pylori in children is limited. This study aimed to investigate the resistance rates and patterns of H. pylori strains isolated from children.

Methods

Gastric mucosa biopsy samples obtained from children who had undergone upper gastrointestinal endoscopy were cultured for H. pylori and susceptibility to six antibiotics (clarithromycin, amoxicillin, gentamicin, furazolidone, metronidazole and levofloxacin) was tested from 2012 to 2014.

Results

A total of 545 H. pylori strains were isolated from 1390 children recruited. The total resistance rates of H. pylori to clarithromycin, metronidazole and levofloxacin were 20.6%, 68.8%, and 9.0%, respectively. No resistance to amoxicillin, gentamicin and furazolidone was detected. 56.1% strains were single resistance, 19.6% were resistant to more than one antibiotic, 16.7% for double resistance, and 2.9% for triple resistance in 413 strains against any antibiotic. And the H. pylori resistance rate increased significantly from 2012 to 2014. There was no significantly difference in the resistance rates to clarithromycin, metronidazole and levofloxacin between different gender, age groups, and patients with peptic ulcer diseases or non-ulcer diseases.

Conclusions

Antibiotic resistance was observed in H. pylori strains isolated from children in Hangzhou and it increased significantly during the three years. Our data strongly support current guidelines which recommend antibiotic susceptibility tests prior to eradication therapy.
ANALYSIS OF ANTIMICROBIAL USE IN CHILDREN WITH SALMONELLA INFECTION IN OUR HOSPITAL

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Background and aims

To provide a reference for promoting the rational use of antimicrobial agents in cases of Salmonella infection.

Methods

The hospital information system and the digitalized case management system were used to retrieve the data of 90 hospitalized children diagnosed with salmonella infection from June 2016 to June 2017 in our hospital, and retrospectively analyzed the data.

Results

Of the 90 children with Salmonella infectious diarrhea, 38 children were used with amoxicillin and clavulanate, 25 cases were with cefotaxime, 12 patients were with tienam, 5 cases of children were treated with two antimicrobial drugs, the other 10 cases were with others; Finally, the amoxicillin clavulanate potassium sensitivity rate is 80%, cefotaxime sensitivity rate is 62%, Tienam's sensitivity rate is 96%, meropenem Sensitivity rate is 98%; the average length of stay is 6.5 days; 84 patients were improved, 6 patients were against-advice discharged.

Conclusions

Salmonella infectious diarrhea is more common in children, according to the results of bacterial culture and drug susceptibility testing to select the appropriate antimicrobial drugs is the key, anymore adequate duration of the treatment is essential.
PATHOGENIC BACTERIA ISOLATED FROM CHILDREN WITH HEMATOLOGICAL MALIGNANCIES
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Background and aims

to investigate infected bacteria, their distribution and drug resistance in children with hematological malignancies (HM), and provide evidence for anti-infection therapy.

Methods

A retrospective analysis was done for 2655 kids with HM treated in the department of pediatrics (2010.08-2012.08) in our hospital.

Results

Of the 2655 cases, the isolating rate of pathogenic bacteria was higher in the kids with ALL and AML, and that with solid tumor was lower. An isolation of 105 strains was obtained. Of which, gram-negative bacteria mainly consisted of Pseudomonas aeruginosa, Escherichia coli, pneumonia klebsiella, of which, six strains (10.91%) were extended-spectrum beta-lactamases (ESBLs). The isolation rate of Escherichia coli and pneumonia klebsiella with positive ESBLs were 45.45% and 14.29%, respectively. Resistance rates of Pseudomonas aeruginosa to ceftriaxone and ceftazimide were 61.54% and 30.77%, respectively, no resistance was found to imipenem, cefoperazone, cefoperazone/sulbactam, piperacillin/tazobactam and gentamycin. One case isolated from three xanthomonas, maltophilia was resistant to imipenem. The gram-positive bacteria mainly consisted of coagulase negative staphylococcus (CNS) and E. faecium. The detection rate of MRCNS was 20.58%, which accounted for 53.85% of all CNS. Meticillin-sensitive staphylococcus kept relatively high sensitive to the second-generation cephalosporin. MRSA were not founded.

Conclusions

Pathogens in children with HM mainly consisted of gram-negative bacteria with higher percentage of drug resistance. In anti-infection therapy, bacterial culture and drug resistant detection should be actively carried out, and antibacterials be rationally used to reduce the development of drug resistant strains.
THE SURVEILLANCE OF GENETIC TYPING AND ANTIMICROBIAL RESISTANCE PROFILE OF CAMPYLOBACTER ISOLATES IN CHILDREN WITH GASTROENTERITIS

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Background and aims

To investigate the genetic typing and antimicrobial resistance profile of Campylobacter isolates in children with gastroenteritis.

Methods

The Campylobacters were isolated by the selective medium and indentified by matrix-assisted laser desorption ionization-time-of-flight mass spectrometry (MALDI-TOF MS). Antimicrobial susceptibility tests were assayed by broth microdilution method and results were analyzed according to CLSI 2015 and National Antimicrobial Resistance Monitoring System (NARMS). The isolates genetic typing was done by MLST.

Results

A total number of 11986 subjects were enrolled and the prevalence rate was 3.24% (388/11986). Among them, the infectious rates of Campylobacter jejuni (C. jejuni) and Campylobacter coli (C. coli) were 2.65% (318/11986) and 0.58%(70/11986) respectively. The peak infectious rate in patients aged from 3 to 5 years old was 5.46%(66/1209) which was higher than that of other age groups (P<0.01). The infectious rate of season distribution showed that January to March was higher (5.64%) than that of the other months (2.75%). The resistance rates of C. jejuni and C. coli to ciprofloxacin were both higher than 90%, the resistant rates of these two isolates were 44.3%, 40.4% to ampicillin, 1.74%, 45.6% to erythromycin, respectively. A total of 55 ST genotypes of C. jejuni were found and 76.4% of them were classified to 13 known clonal complexes (CCs), of which CC-353 contains the most strains. And 20 ST genotypes of C. coli were found and 80% of them were classified to CC-828.

Conclusions

Campylobacter is a major pathogenic bacteria associated with intestinal infection in children. The prevalent pattern of this pathogen was sporadic.
IN VITRO SUSCEPTIBILITY OF AZITHROMYCIN AGAINST CLINICAL ISOLATES OF SALMONELLA SPECIES
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Background and aims

To investigate the antimicrobial susceptibility to azithromycin among Salmonella spp isolated from clinical samples in Shenzhen Children's Hospital.

Methods

Confirmed Salmonella spp isolates were subjected to antimicrobial susceptibility test using the Kirby-Bauer disk diffusion method and the E-Test were performed according to the manufacture's recommendations. A simple linear regression was used to test whether the zone size can predict MIC.

Results

The 94 Salmonella spp used in this study were isolated from feces(73 strains), blood(10 strains), pus(10 stains) and cerebrospinal fluid(1 strain) ; most of the serotypes of the strains belong to the group B and D, which were 67.02% and 27.66%, respectively. For all strains, azithromycin MICs were observed between 2~96µg/ml (MIC50=4µg/ml, MIC90=6µg/ml )and the zone sizes were between 6.50~19.75mm which showed significant correlation between them (P=0.0000, |r| =0.8363). The sensitivity of seven antibiotics were 96.81%(Azithromycin),76.59%(Trimethoprim-sulfamethoxazole),68.09%(Ceftriaxone),68.09%(Chloramphenicol),28.72%(Nalidixic acid) and 24.47%(Ampcillin), respectively.

Conclusions

The azithromycin shows a high sensitivity to Salmonella species and can be selected for an additional agent for treatment of Salmonella infections.
Background and aims

Pertussis is a highly contagious bacterial disease of the respiratory tract, caused by Bordetella pertussis. It occurs mainly in infants and young children, and is easily transmitted from person to person, mainly through droplets of household contacts. We investigate the antimicrobial susceptibility of B. pertussis isolates collected from Shenzhen Children's Hospital of China.

Methods

Nasopharyngeal samples were collected from children with real-time polymerase chain reaction (RT-PCR) confirmed pertussis and household contacts with clinically suspected pertussis or not. Diagnoses were confirmed by culture and RT-PCR. Bordetella pertussis (Bp) isolates were characterized by antimicrobial susceptibility.

Results

Of 730 participants, 123/339 children (36.28%) and 103/391 contacts (26.34%) were culture positive. Most children (82.89%, 281/339) were <6 months and 38.94% (132/339) of whom were <3 months of age, including 8 neonates; Most positive contacts were mothers (49.51%, 51/103) 18-44 years of age. Antimicrobial susceptibility of B. pertussis isolated from children were tested, the MIC of Erythromycin and Azithromycin were in the range of 0.023-256μg/ml and 0.016-256μg/ml, respectively. All isolates were susceptible to SMZ-TMP, the sensitivity to macrolides were about 47.7%.

Conclusions

Pertussis is circulating in Shenzhen and most infections occur in infants <6 months of age, with mothers as the main source of infection. An adolescent/adult booster should be considered. Adoption of sensitive and specific laboratory tests would improve pertussis diagnosis and surveillance.
THE PROPHYLACTIC ANTIBIOTICS USE IN TRANSCATHETER THERAPY DURING PERIOPERATIVE PERIOD OF CONGENITAL HEART DISEASE IN CHILDHOOD

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Background and aims

Our study aimed to explore the catheter-related infection (CRI) associated with transcatheter therapy of congenital heart disease (CHD) of childhood and confirm whether there was correlation between CRI and prophylactic antibiotics.

Methods

All CHD childhood patients underwent transcatheter therapy were involved in the study and they were divided into prevention group (prophylactic use of antibiotics) and control group (non-prophylactic use of antibiotics). Postoperative body temperature, leukocyte count, CRP and clinical symptoms were observed and blood of suspected cases of infection was cultured. The postoperative follow-up was all last for one month at last.

Results

Total 616 cases with CHD interventional operation were involved in the study, including 217 cases in prevention group and 399 cases in the control group. The postoperative fever occurred in 55 cases (8.93%), among which 37 cases were diagnosed as nosocomial infection. Among the no-fever patients, there was 1 case diagnosed as CRI (exit site infection). A total 38 cases (38/616, 6.16%) were diagnosed as hospital infection, including 15 cases in prevention group (6.91%), 23 cases of control group (5.76%). There were 11 cases of hospital infection after ventricular septal defect interventional closure, and there was no significant difference between with glucocorticoid or without glucocorticoid (p>0.05).

Conclusions

The CRI incidence is very low, and the exit-site infection is relative common. Routine prophylactic use of perioperative antibiotics is not recommended. Short-term use of corticosteroids for postoperative arrhythmias in patients with ventricular septal defect intervention would not increase the incidence of hospital infection and CRI.
Objective: Study on the effects of human umbilical cord mesenchymal stem cells on infected state of human alveolar type II epithelial cells.

Methods: Human alveolar type II epithelial cells A549 (1×10^5/ml) 2ml and PA (3×10^4CFU/ml) 2ml has grown after 6 hours, add hUCMSCs (1×10^6/ml) 2ml as the experimental group, add equal amounts of phosphate buffer (PBS) for infection, A549 and PBS and the medium has grown as the control group. A549 cells morphological changes between the compared groups (Transmission electron microscope, TEM), A549 cell viability (new CCK-8 cell proliferation assay Kit), A549 cells apoptosis (Annexin V-FITC/PI double staining flow cytometry) and the expression of A549 pulmonary surfactant A (SP-A) (Western Blot).

Results: Transmission electron microscope cell morphology observation displayed, infection group A549 cell damaged obviously, cell quality appeared empty bubble degeneration, chromatin height agglutination, visible apoptosis bodies; experiment group cell package film structure full, nuclear film full, nucleolus obviously, nuclear chromatin electronic density low, chromatin uniform, no apoptotic bodies; control group A549 cell structure full, membrane surface micro-fluff rich, nuclear film full, nuclear week clearance structure normal, chromatin uniform; infection group and control group compared, Infection group A549 cell cell survival significantly reduced [(70.35 ± 2.89)% and (97.37 ± 2.07)%, n=3, P<0.01], apoptosis rate significantly increased [(8.63% ± 0.16)% and (2.55 ± 0.11)%], n=3, P<0.01], In the infected group, PA could damage A549 cells and decrease the amount of SP-A expression (n= 5, P<0.05) .In the experiment group, the protective effect of hUCMSCs on the A549 cells after infection may increase the expression of SP-A (n= 5, P<0.05) .

Conclusions: HUCMSCs inhibits the infection of A549 cells apoptosis and protection of A549 cells secrete SP-A.
EPIDEMIOLOGY OF BACTEREMIA IN INFANTS IN THE NEONATOLOGY DEPARTMENT

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Background and aims

Bacteremia occurs in neonates who have a blood culture drawn. Worldwide data suggest that Escherichia coli (ECO), group B Streptococcus (GBS), and Staphylococcus aureus (SAU) are leading causes; however, Pathogen is different in Early-Onset Sepsis (EOS) or Late-Onset Sepsis (LOS), and also in community-acquired (CA) and hospital-acquired (HA) infection.

Methods

We conducted a retrospective analysis of the pathogen distribution of bacteremia and the relationship between the time of sepsis and hospitalization from neonatology department from January 1, 2012, through December 31, 2015. We identified 238 cases of invasive infection, repeat blood cultures positive for the same bacteria were excluded.

Results

The most common pathogen was Klebsiella pneumoniae (KPN, 78), followed by GBS (63), ECO (62) and SAU (35), which was different from the previous data. Respectively, for EOS, GBS (33) and SAU (9) were more than ECO (19) and KPN (12); for LOS, KPN (66) and ECO (43) were significantly more than GBS (30) and SAU (28); for HA infection, KPN (71) and ECO (26) were significantly more than SAU (27) and GBS (0); moreover, the pathogens for CA infection were GBS and ECO, and for HA infection were KPN and SAU, most of the KPN and SAU were multidrug-resistant, requiring the use of carbapenems and vancomycin.

Conclusions

These data show that the epidemiology of bacteremia in neonates in the Neonatology Department has its own characteristics and the distribution of pathogen is different depending on the time of hospitalization and the time of sepsis onset.
EFFECTS OF DIFFERENT KINDS OF SKIN DISINFECTANTS ON THE DETECTION RATE OF COAGULASE NEGATIVE STAPHYLOCOCCUS IN PAEDIATRICS BLOOD CULTURE

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Background and aims

To compare the effect of different skin disinfectant on the detection rate of coagulase negative staphylococcus (CNS), so as to provide a basis for improving the accuracy of blood culture.

Methods

Retrospective analysis the blood culture result of hospitalized patients between April 2015 and April 2017. April 2016 as the cut-off point, from April 2015 to March 2016, we used compound iodine preparation containing 0.45% chlorhexidine for skin disinfection; Between April 2016 and April 2017, the neonatal wards adopt the compound iodine preparation containing 0.03% chlorhexidine for skin disinfection, the non-neonatal wards adopt chlorhexidine alcohol containing 2% chlorhexidine for skin disinfection. Compared the CNS detection rate of different skin disinfectant separately.

Results

From April 2015 to March 2016, a total of 6247 specimens of blood culture was collected in neonatal wards. 152 isolates of CNS was checked out, the detection rate was 2.4%; from April 2016 to April 2017, a total of 8526 specimens of blood culture, 189 isolates of CNS was checked out, the detection rate was 2.2%, Compared the detection rate of different skin disinfection, the difference was not statistically significant (P>0.05); In non-neonatal ward, a total of 4759 specimens of blood culture was collected, among them the CNS was 222 strains, the detection rate was 4.7%, from April 2016 to April 2017, there was 5513 specimens of blood culture, among them the CNS was 117 strains, the detection rate was 2.1%. Compared the detection rate of CNS of different skin disinfection, the difference was statistically significant (P<0.05).

Conclusions

Adopting chlorhexidine alcohol containing 2% chlorhexidine for skin disinfection, which can reduce the detection rate of CNS.
THE CHANGES OF INTESTINAL MICROBIOTA IN NEONATES WITH PNEUMONIA BEFORE AND AFTER ANTIBIOTICS TREATMENT BY HIGH-THROUGHPUT SEQUENCING

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Background and aims

The human gut microbiota is complex and diverse which has a very close relationship with the human health. It has evolutionarily conserved roles in the metabolism, immunity, development, and behavior of the host. Factors that shape the gut microbiota in early infancy have not been satisfactorily examined especially under the medical intervention. Here we explore the changes of intestinal microbiota in neonates with pneumonia before and after antibiotic treatment, and to analyze the differences of gut microbiota structure between the gut microbiota of the neonates before and after antibiotics use.

Methods

Fecal samples were collected from 30 neonates with neonatal pneumonia before and after 7 days antibiotics treatment. DNA of fecal samples was extracted and PCR amplification was performed targeting V3 variable region 16S rDNA and detected by high throughput sequencing.

Results

On the phylum classification level, the Actinobacteria phylum bacteria were significantly higher in before antibiotics use group than those in after antibiotics use group (P = 0.003 < 0.05); but the Proteobacteria in before antibiotics use group were lower than in after antibiotics use group (P = 0.033 < 0.05) (Fig1). On the genus classification level, the Enterobacter genus bacteria were significantly higher in after group than those before antibiotics use. While the Bifidobacterium were lower in after antibiotics use group (Fig2).
Conclusions

Bacteria population diversity was not significantly suppressed in individual infants immediately after antibiotics administration, but the community structure represented different. The number of intestinal pathogenic bacteria in infants before antibiotics treatment was higher than those after antibiotics treatment, but some benefit bacteria had lower abundance in infants after antibiotics use.
Background and aims

Malaria is a major cause of morbidity and mortality especially among children under 5 years. However, reduction in global malaria burden has been reported. This study re-examined malaria burden in Maiduguri, Northeast Nigeria amidst the insurgency.

Methods

Between May, 2011 and November, 2012, 1,657 feverish subjects were screened for malaria by microscopy. Giemsa-stained blood smears were prepared and examined for asexual parasitaemia (AP) and gametocytaemia. Parasite density (PD), gametocyte density (GD) and gametocyte sex ratio (GSR) were determined.

Results

The mean age of the 1,657 subjects was 27.5 ± 12.2 years with 47.0% (778/1,657) males and 53.0% (879/1,657) females. Prevalence of AP was 22.0% (364/1,657) with geometric mean (GM) PD of 10,090 (300 – 275,000) parasites/μl blood; these were highest among subjects aged < 5 years (p<0.05) and in months of August (71.2%, 52/73) and September (80.7%, 46/57) [p<0.05]. Prevalence of gametocytaemia was 10.4% (38/364) with GMGD of 109 (8 – 464) gametocytes/μl blood; the prevalence was highest among subjects aged < 5 years (p<0.05) and in dry (15.8%, 26/165) than wet (6.0%, 12/199) months (p<0.05). Weighted mean GSR was 0.4 ± 0.1; proportion of GSR > 0.5 was 31.6% (12/38) and was higher (p<0.05) in the dry (41.7 %; 10/24) than in wet months (14.3 %; 2/14).

Conclusions

Malaria persisted in Maiduguri, Northeast Nigeria especially among children below 5 years and during wet months. Thus, global eradication of malaria may be difficult without special attention given to crisis-ridden regions.
Introduction.
Efforts to improve child survival can be effective only if they are based on reasonably accurate information about the causes of childhood deaths. The aim of the present work is to make an epidemiological analysis of infant mortality by malaria in the countries of South America.

To analyze the current situation in Peru compared with the rest of South America, we created a chart using World Health Organization data on cases of malaria death and Malaria child mortality, analyzing the incidences by year. A linear trend graph is created by countries and by year showing the percentage of infant mortality, children under four years or less.

In South America (excluding Guyana, Suriname, and French Guyana), five countries (Argentina, Chile, Ecuador, Paraguay, and Uruguay) have not presented cases of infant mortality due to malaria. There is a decrease in the percentages of countries such as Peru, Brazil, Colombia, and Bolivia. Venezuela is the only country that is not managing to control infant mortality by Malaria.

This information on the percentage of infant mortality from malaria should give priority in these countries to improve the intervention and determine their effectiveness. Although Peru is an endemic country and its incidence has not been reduced, it is the only country that has managed to reduce cases of child mortality due to malaria. Multidisciplinary strategies for the control of malaria must be continued, from hygiene education for the
community and better access to medication, to the creation of vaccines to interrupt the spread of malaria
Background and aims

Children under 5 years of age are one of most vulnerable groups affected by malaria. There were an estimated 429,000 malaria deaths around the world in 2015, of which an estimated 303,000 (70.6%) were in children under 5 years of age.

Methods

This paper presents an analysis of secondary data obtained from a rural tertiary hospital in northwestern Nigeria over a period of one year (1st January to 31st December 2016). Results were presented as means with standard deviation, ratio, tables, figures and Chi-squares with p values.

Results

144 (19.6%) under five years old of the total of 733 children admitted had severe malaria. The mean age at presentation was 8.1 ±7.4 months with the majority aged less than 24 months. More males were affected with M: F of 1.8:1. Duration of symptoms was 3.7 ±2 days. Multiple convulsions, severe anemia and cerebral malaria were the commonest presentation. Majority were discharged home, and 11 (7.8%) left against medical advice. CFR= 6.25%. Male sex, altered consciousness level and anemia adversely affected prognosis.

Conclusions

Severe malaria in under five years old children constituted a significant cause of admission and deaths. Current preventive measures should be strengthened with specific focus on this vulnerable age group.
STUDY ON THE ARIMA MODEL APPLICATION TO PREDICT MALARIA CASES IN CHINA

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Background and aims

Autoregressive integrated moving average (ARIMA) model was used to predict the monthly reported malaria cases in China to provide a reference for malaria prevention and control of malaria.

Methods

SPSS 22.0 software (IBM, USA) was used to construct the ARIMA model based on the monthly reported malaria cases, which based on the reported malaria cases of time series of 2006-2015 year and 2011-2015 year, respectively. And the date of malaria cases from January to December 2016 was used as a validated data to compare the accuracy of two ARIMA model.

Results

The models based on the 2006-2015 and 2011-2015 data of the monthly reported cases of malaria in China are ARIMA\((2, 1, 1) (1, 1, 0)_{12}\) and ARIMA\((1, 0, 0) (1, 1, 0)_{12}\), respectively, and then these two ARIMA model were used to forecast the number of malaria cases in 2016 year. The comparison between two models shows that the average of the relative error was not decreases with the accumulated data, but the result showed that the ARIMA model based on the date of 2011-2015 year have more higher accuracy of forecasting than that of the model based on the date of 2006-2015 year.

Conclusions

It suggests that the establishment and prediction of ARIMA model is a dynamic process, which needs to be adjusted unceasingly according to the accumulated data, in addition, the major changes of epidemic characteristics of infectious diseases must be considered.
THE RELATIONSHIP OF IRF7 AND IFN-Β IN TYPE I IFN PATHWAY INTROPHOBLAST

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Type I IFN pathway was thought as a mainly inflammation pathway involved in preterm birth for infection. However, how does this process happen was still unknown. The objective of this study was to reveal the relationship of IRF7 and IFN in trophoblast in order to understand further the different expression of gene in type I IFN pathway in trophoblast when microorganisms affect.

Validate the function of IRF7 in type I IFN pathway not only in SW71 LPS induced and MHV infected, but also in cells treated by IFN-β by qPCR and western-blot after analysis of human data.

There was only one common gene (IRF7) by bioinformatics analysis in down regulated genes of human and mouse placenta. By qPCR, it was showed that the expression of IRF7 and IFN-β were decreased in mouse placenta with MHV infected compared to its increasing in LPS induced cells. Meanwhile, the expression of IRF7 and IFN-β were elevated in human trophoblast LPS induced as well. Furthermore, in protein expression, total and phosphorylated IRF7 expressed later than IRF3 in LPS induced SW71. IFN-β could induce total IRF7 expression in trophoblast, but not IRF3.

It confirmed that the expression of IRF3 was prior to IRF7 in Type I IFN pathway in trophoblast. We demonstrate that IFN-β can regulate IRF7 expression in trophoblast. So we suggest that there may be a circle between IFN-β and IRF7 in type I IFN pathway in trophoblast, once virus blocks this circle, then innate immune response will be altered in trophoblast contributing to preterm birth.
PENICILLIUM MARNEFFEI SEPSIS IN A HYPOGAMMLOBULINEMIA PATIENT

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Background and aims

A patient of Hypogammlobulinemia merged with Penicillium Marneffei sepsis was reported.

Methods

A 1-year-old boy with hypogammaglobulinemia came to our clinic with 2-month history of skin rashes and 6-day history of fevers. He was examined to be continuous low-moderate fever and Hepatosplenomegaly. Many scattered necrotic papula and ulcer distributed all over the body, with central fester and scabed partly. Immunoglobulin, liver function, blood culture, ulcer pus culture, bone marrow smear and skin histopathology were tested.

Results

Immunoglobulin G was lower than 0.33 g/L, immunoglobulin A was lower than 0.07 g/L and liver enzymes was elevated. Blood culture and ulcer pus culture were positive for Penicillium Marneffei. Histopathology of the skin biopsy demonstrated numerous intracellular yeast-like organisms and PAS stain was positive. The patient was diagnosed as hypogammaglobulinemia and Penicillium Marneffei sepsis. Considering liver damage, he was treated with Cancidas and gamma globulin to support. 1 week later no significant improvement occurred, and bone marrow biopsy showed hyperplasia obviously, and "Hemophagocytic syndrome" was considered. The patient left the hospital voluntarily and lost.

Conclusions

Rashes can be the first symptom of Penicillium marneffei. Attention should be paid to the patients with rapid development rashes and unexplained fever. It may be diagnosed as immunization defective disease and sepsis.
DYNAMIC OROPHARYNGEAL AND INTESTINE MICROBIOTA CHANGE OF BRONCHIOLITIS INFANT
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Background and aims

We aimed to identify oropharyngeal and intestine airway microbiota and to determine their association with the likelihood of bronchiolitis in infants.

Methods

We collected oropharyngeal airway samples and fecal samples from 27 infants hospitalized with bronchiolitis. We concurrently enrolled 22 age-matched healthy controls. Total bacterial DNAs were extracted and submitted high throughout sequencing on the V3-V4 viable region of 16S rDNA. Tags and Operational Taxonomic Units (OTU) were then obtained and analysis of taxonomy, abundance, alpha diversity and beta diversity were performed.

Results

In total 73,056.58 Mbp tags in 199 samples were produced. The dominate phylum of intestine microbiota included Firmicutes, Bacteroidetes, Proteobacteria and Actinobacteria. The dominate phylum of oropharyngeal microbiota included Firmicutes, Bacteroidetes and Proteobacteria. The abundance of Proteobacteria (42.14±30.72vs.24.34±15.83 P<0.05) was increased in the intestine microbiota and Firmicutes (84.79±14.92vs.56.92±24.54 P<0.05) was increased in the oropharyngeal microbiota. In the genus level, the dominate genus of intestine microbiota was Cronobacter and the dominate genus of oropharyngeal was Streptococcus. The abundance of Enterococcus was increased in the intestine microbiota (11.20±14.18vs.3.19±4.98 P<0.05) and Veillonella was increased in the oropharyngeal microbiota. Klebsiella decreased dramatically after therapy(20.80±27.24vs.15.42±24.84 P<0.05) oropharyngeal and intestine microbiota kept no change when clinical symptoms remission was apparently identified.

Conclusions

oropharyngeal and fecal microbiota in infants with bronchiolitis differed significantly with healthy infants. There were subtle dynamic microbiota changes in oropharynx and intestine during conventional therapy of bronchiolitis.
ALTED UPPER AIRWAY MICROBIAL DIVERSITY AND COMPOSITIONS IN YOUNG CHILDREN HOSPITALISED FOR ACUTE ASTHMATIC ATTACKS
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Background and aims

Several studies reported upper airway microbiota in children with bronchiolitis and recurrent wheeze using 16S rRNA-based sequencing approach. This study characterised high-resolution nasopharyngeal (NP) microbiome of Chinese children with asthma exacerbation.

Methods

NP secretions were collected in Jan-Apr 2015 from 24 preschool children hospitalised for human rhinovirus (HRV)-associated asthma exacerbations, 14 inpatient virus-negative controls with upper respiratory tract infection (RTI), and 38 community controls without any RTI for at least four weeks. Genomic DNA was sequenced using Illumina HiSeq X Ten, and non-human reads underwent microbial taxonomic classification using MetaPhlAn2 version 2.6.0. Linear Discriminant Analysis (LDA) scores for microbial abundances were calculated by LDA Effect Size programme.

Results

All groups had low but similar NP biomass (5-7% of all sequence reads). NP biodiversity as represented by Shannon diversity index was lower in cases than community controls (median [IQR]: 3.49 [2.81-3.97] vs 4.17 [3.24-5.84], P=0.029) but similar to inpatient controls (3.44 [2.30-4.46], P=0.674). Patients with asthma exacerbation had higher levels of viruses (log LDA score 5.20, P=0.0031) and lower levels of bacteria (log LDA score 5.20, P=0.0032). Bacilli (taxonomy level: class) was lower in cases compared to inpatient and community controls (log LDA score 4.82, P=0.0055). The class Actinobacteria was higher in community controls than cases and inpatient controls (LDA score 4.47, P=0.00076).

Conclusions

NP biodiversity is lower in children with asthma exacerbations than community controls. Our results also show high abundance of virus-matched reads in metagenome of most NP samples.

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TARGETING GALECTIN-1 REDUCE THE SEVERITY OF DNA DAMAGE AND INFLAMMATION CAUSED BY MYCOPLASMA PNEUMONIAE INFECTION

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Background and aims

More and more severe and refractory M. pneumoniae pneumonia (MPP) cases have been reported in recent years, and some of them even developed life-threatening complications. Although not completely understood, the pathophysiology of M. pneumoniae infection involves dysregulation of inflammation and DNA damage. In the quest for novel therapeutic targets, we investigated the involvement of galectin-1 (Gal-1), an endogenous glycan-binding protein endowed with both immunosuppressive and DNA damage accelerating activity.

Methods

A549 were infected with M. pneumoniae for different time interval. For the evaluation of Gal-1 function, following performance were taken: 1) reactive oxygen species (ROS) generation detected by flow cytometry; 2) the percentage of γH2AX positive cells measured by flow cytometry; 3) γH2AX levels detected by western blot; 4) γH2AX foci formation confirmed by immunofluorescent microscope; 5) altered expression of cytokines detected by RT-PCR.

Results

The expression of Gal-1 were elevated both intracellular and extracellular in M. pneumoniae-infected group compared to untreated group. When Gal-1-knockdown A549 cells were infected by M. pneumoniae, the generation of ROS were decreased, accompanied by lower percentage of γH2AX positive cells, lower γH2AX expression levels and reduced γH2AX foci both at 12h and 24h. Simultaneously, the expression of proinflammatory cytokine (IL-8 and IL-18) increased significantly at 24h instead of 12h in M. pneumoniae-infected Gal-1 knockdown group, while the expression of other cytokines (IL-1β, IL-6 and TNF-α) didn't change statistically.

Conclusions

Gal-1 may mediate the M. pneumoniae-induced cytotoxic effect directly or indirectly, and validate this lectin as a possible target for the treatment of M. pneumoniae-associated disease.
Extrinsic allergic alveolitis, also called Hypersensitivity pneumonitis (HP), is a complex pulmonary syndrome, caused by a repeated and prolonged inhalation of environmental antigens, to which the patient is sensitized and hyper responsive, primarily consisting of organic dusts of animal or vegetable origin, more rarely from chemicals. Farmers and bird keepers are most frequently affected by this disease. The pathobiology of the disease is not fully understood. Antigen from the environment and host/genetic factors are both important. The HP diagnosis is difficult because of lacking of widely accepted diagnostic criteria and mainly depends on clinical symptoms (cough, dyspnea) in a person exposed to environmental antigens, and the presence of characteristic changes in high resolution chest computed tomography (HRCT) (bilateral, mosaic, ground glass opacities in the middle and lower lung zones, ill-defined centrilobular nodules and the sign of air-trapping on expiration). Bronchioloalveolar lavage fluid (BALF) examination is also beneficial in establishing the HP diagnosis. Lung biopsy is recommended in case of atypical clinical presentation. The elimination of the antigen from the environment and Corticosteroids may contribute to the improvement in the acute and sub-acute form of the disease, but the long-term efficacy of corticosteroids has never been validated in prospective clinical trials. The prognosis of HP patients is generally perceived as good. Nevertheless, in some patients progressive pulmonary fibrosis and severe respiratory disfunction can be observed.
MICROBIOTA COMPOSITION IN ANTERIOR NARES, NASOPHARYNX AND OROPHARYNX OF HEALTHY CHINESE CHILDREN

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Background and aims

The upper respiratory tract (URT) is home to various microbial commensals, which function as competitors to pathogens and immunity educators. However, little has been reported on normal microbiota carriage, including the structure and development of the URT in Chinese children.

Methods

In this study, we performed a 16S rDNA gene sequence analysis on 83 anterior nares (ANs), 60 nasopharynx and 97 oropharynx samples from 97 healthy Chinese children (HCC) aged ≤12 years old.

Results

The results indicated that ANs and nasopharynx microbiota were similar from infancy to childhood, being typically colonized by Moraxella, Staphylococcus, Corynebacterium, Streptococcus, and Dolosigranulum. By contrast, the oropharynx was occupied by Streptococcus, Prevotella, Neisseria, Veillonella, Rothia, Leptotrichia and Haemophilus. Streptococcus and Rothia decreased dramatically with age, while Prevotella, Neisseria, Haemophilus and Leptotrichia increased significantly in individuals more than one year old. The lower respiratory tract (LRT) harboured different dominant genera compared with the URT, featuring Lactococcus, Bacillus, Solibacillus, Pseudomonas, Arthrobacter, and Exiguobacterium.

Conclusions

This work provides an important reference for understanding microbial dysbiosis in the ANs, nasopharynx and oropharynx of Chinese paediatric patients.
IMBALANCED URT/LRT MICROBIOTA OF CHILDREN WITH PNEUMONIA AND ITS PROMISING APPLICATION IN CLINICAL DIAGNOSIS

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Background and aims

Pneumonia is one of the most important cause of morbidity and mortality in children. Lower respiratory tract(LRT) sampling is easily contaminated and mainly used in children with severe pneumonia, as guidelines recommended. In addition, present clinical detection also have limitations to determine microbial aetiology.

Methods

32 children, who were hospitalized with pneumonia, were selected. Age-matched healthy children were chosen as normal controls. Nasopharynx(NP) and oropharynx(OP) sampling was conducted for both diseased and healthy children, while LRT sampling was also performed for hospitalized children. Microbiota structure was compared between healthy and diseased children, as well as between NP, OP and LRT of hospitalized patients, through 16S rDNA analysis.

Results

The results indicated that NP and OP microbiota of healthy children differed significantly with that of diseased children. *Streptococcus*, *Staphylococcus* and *Mycoplasma* accumulated dramatically in NP microbiota of hospitalized patients. By contrast, healthy children-dominated *Moraxella* accounted for less than 0.1% NP microbiota of diseased children. OP microbiota of patients harbored lower diversity and higher abundance of *Staphylococcus* and *Corynebacterium*, by comparison with healthy children. Common pathogens, including *Streptococcus pneumoniae* and *Mycoplasma pneumoniae*, could be identified both in URT and LRT, implicating URT microbiota diagnosis hold the potential in pneumonia diagnosis. Additionally, pathogen detection based on URT or LRT microbiota analysis could identify new pathogens, which could not be diagnosed through culturing or PCR amplification.

Conclusions

This work provides an extensive insights into clinical application of respiratory microbiota analysis: URT sampling could represent LRT diagnosis for some common pathogens; high-throughput sequencing of URT/LRT could identify more pathogens.
CHARACTERIZATION OF GUT MICROBIAL COMMUNITY IN CHINESE POPULATION ON THE BASE OF CROSS-CONTINENT HUMAN GUT MICROBIOTA ANALYSES

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Background and aims

Gut microbiota (GM) is closely related to human health and involves various diseases including colitis, diabetes, obesity, autism, asthma and etc. Many factors affect GM composition, including diet habit, probiotic or antibiotic exposure, host genetics and etc. In this study, we intended to detect the influences of environmental factors on GM composition and the developing pattern of GM in global population.

Methods

Feces which collected from 65 Chinese infants were analyzed by 16S rDNA sequencing. On the other hand, GM data was obtained from original paper with background information. Consequently, 1,051 health samples from Africa, Europe, China, North America and South America across age were acquired.

Results

The breeding method was the potent factor for GM composition in children under 3 years old, but the influence of diet habits from different locations getting important since then. Focusing on children between 1 and 3 years old, GM diversity was lower in Chinese population when compared with peer cohorts from Europe, North America and South America. The regional pattern of GM was not obvious in infants under 1 year old, and it emerged with growing age.

Conclusions

GM differences among populations cross-continent were mainly determined by the diet habits. The procedure of GM maturity reflected the pattern of food intake and corresponded to the body development.
DETECTION AND ANALYSIS OF FECAL INTESTINAL MICROFLORA IN CHILDREN WITH HENOCH–SCHONLEIN PURPURA

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Background and aims

More and more studies have found that intestinal microflora play a very important role in autoimmune and allergic diseases. This study aimed to detect and evaluate the intestinal microflora in children with HSP and to explore the relationship between HSP and intestinal microflora.

Methods

Fecal samples were collected from children without HSP and children with HSP at the active stage and remission period. A 16SrDNA high-throughput sequencing technique was used to detect the intestinal microflora.

Results

The average abundance of the Bacteroidetes phylum in children with HSP at the active stage increased along with Dysgonomonas, Parabacteroides, Prevotella and unclassified Bacteroidetes at the genus level. The average abundance of the Firmicutes phylum decreased significantly, accompanied by a significant decrease of Megamonas, Acetivibrio, Anaerostipes, Butyricicoccus, Clostridium XI, Clostridium sensu stricto, Coprococcus, Dorea, Faecalibacterium, Lachnospira, Lachnospiraceae incertae sedis, Roseburia, and unclassified Lachnospiraceae at the genus level. The average abundance of Proteobacteria phylum significantly increased, accompanied by significant increases in Comamonas, Escherichia/Shigella, Halomonas, Succinivibrio, and Sutterella at the genus level. In addition, the average abundance of Eggerthella, which belongs to actinomycetes, was significantly higher in patients at the acute phase than that in the children without HSP. The intestinal microflora of children in the convalescent group seemed not to shift back to normal.

Conclusions

There is a dysregulation of intestinal microflora in children with HSP at the active stage and recovery stage. The relationship between such disorders and the pathogenesis, clinical and prognosis of HSP is worthy of further study.
X-LINKED LYMPHOPROLIFERATIVE DISEASE TYPE 2 COMPLICATED WITH REVIEW CHOLESTATIC LIVER DISEASE AND APLASTIC ANEMIA: CASE REPORT AND LITERATURE

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Background and aims

X-linked lymphoproliferative syndromes (XLP) is rare primary immunodeficiencies. Here we report the clinical features, gene mutation and treatment in a Chinese patient with X-linked lymphoproliferative disease type 2 (XLP-2).

Methods

The clinical records, genes of immunodeficiency, complications and prognosis were summarized and the literatures were reviewed in Pubmed.

Results

The patient with high fever, jaundice, hepatomegaly and mild anemia diagnosed cholestatic liver disease. His body temperature returned to normal soon, but jaundice dissipated slowly. The patient complicated with aplastic anemia with worsen anemia and repeated thrombocytopenia in 50 days after being infected with EB virus. The disease coming on XIAP gene sequence analysis showed that the patient harbored a missense mutation (c.962C>G; p.A321G) in exon 3. His mother was carrier. He was cured with hematopoietic stem cell transplantation (HSCT) and is currently doing well.

Conclusions

XLP-2 patients occasionally complicated with liver diseases. If appear unknown and poor treatment of liver diseases, it is important to perform genetic detection early and to receive therapy as early as possible.
Objectives: Some primary immunodeficiency diseases (PIDs) present autoimmunity disorders like systemic lupus erythematosus (SLE), and may be misdiagnosed. The objective is to make a definite diagnosis of 3 suspected SLE children with blood system involvement and summarize their clinical characteristics.

Methods: We collected and analyzed the clinical data of the 3 cases. DNA was extracted from patients’ and their parents’ peripheral blood as well as oral mucosa cells, hair follicles and nails. 237 genes were detected with the application of gene trapping high-throughput sequencing of PIDs panel and suspicious gene or mutation was verified by Sanger sequencing.

Results: Clinical features: Those patients including two boys and a girl, whose onset ages were less than 5, presented with rashes, arthralgia, and hepatomegaly with/without splenomegaly or lymphadenopathy as well as symptoms suggesting other systems involvements like pericardia perfusion, severe mixed ventilation dysfunction or proteinuria. Laboratory data revealed severe thrombocytopenia, highly elevated IgG, positive ANA and anti-dsDNA. 2. Gene results: a NRAS mutation either c.38G>A, p.G13D or c.37G>T, p.G13C was detected in patients’ blood, and was diagnosed as ALPS IV.

Conclusions: We reported the first three ALPS IV cases in China and concluded their characteristics. For those early-onset SLE-like patients with predominant hematologic disorders like thrombocytopenia, elevated serum IgG, accompanied with hepatosplenomegaly with/without lymphadenopathy, a genetic screening of immunodeficiency diseases, especially the NRAS detection might be required.
EFFECT OF BIFIDOBACTERIUM ON CINC AND IGF-1 IN INTESTINAL INJURY OF PREWEANING RATS

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AIM: To investigate the protective effect of bifidobacterium endotoxin-induced intestinal injury in preweaning rats.

METHODS: Preweaning rats were randomly divided into three groups: a control group (C), a model group (E) and a treatment group (T). Both groups E and T were intraperitoneally injected with lipopolysaccharide (LPS), and group T was intragastrically administrated with bifidobacterium suspension 7d before LPS administration. Group C was intraperitoneally injected with normal saline. The rats were killed at 2, 6 or 12h, respectively, after endotoxin or physiological saline injection. The expression of ileal CINC and IGF-1 was evaluated by reverse transcription-polymerase chain reaction and immunohistochemical technique.

RESULTS: The expression of CINC mRNA in group E was significantly increased at 2 and 6h. The expression of CINC mRNA in group T was significantly lower than in group E (P < 0.05) apparently in 2h; The expression of brown dye of IGF-1 is light and thin at 12 h in group E (P<0.05) ,and The expression of brown dye of IGF-1 is thick and dense from 6h, significantly higher at 12 h in group T (P<0.05) ; The expression of IGF-1 in group E mRNA was significantly decreased at 6,12h (P<0.05).

CONCLUSION: The expression of CINC mRNA increases in model rats, Bifidobacterium protects the gut by inhibiting CINC expression; The expression of IGF-1 mRNA decreases in model rats, Bifidobacterium protects the gut by inhibiting the decrease of IGF-1 expression; Bifidobacterium may increase the expression of IGF-1 through inhibiting the local inflammatory reaction, and improve the intestinal immune barrier function.
Intestinal microbiota plays an important role in human health and many disease. The composition of the intestinal flora, especially impact factors on gut microflora initial colonization, has been gradually becoming hot topic in recent years. Human want to have more insight into the relationship between intestinal flora and disease and health, thus preventing and treating diseases. In this paper, gestational age, delivery route, growing environment, type of feeding and diet, antibiotic use, bacterial interference, and application of probiotics, genetic factors were summarized. By the test discussing the effects of different feeding methods on the initial colonization and composition of intestinal.

Objective: To investigate the changes of intestinal flora in breast fed (control group) and formula milk feeding (experimental group 4). Formula contains probiotics or whey protein concentrate, respectively. Methods: Sequencing technology of the 16S rDNA Amplicon was used to analyse the stool microbiota of subjects at the fourteenth day and the two-, four-, six-, eight-, ten-, 12-month. Results: Micrococcus, Bacteroides, and Bifidobacterium is the predominant bacteria in all of the subjects. The number of fecal bifidobacteria were rising steadily in the breast-feed, becoming the dominant flora by the time subjects are one year old, however, fecal bifidobacteria is fluctuating in the formula fed baby.
THE RELATIONSHIP BETWEEN BACTERIAL COLONIZATION/INFECTION AND WHEEZING IN THE CHILDREN YOUNGER THAN 3 YEARS WITH LOWER AIRWAY INFECTION

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Background and aims

To evaluate the relationship between wheezing and bacteria colonization/infection in children with lower respiratory infection younger than 3 years.

Methods

The isolates were collected from 206 patients with lower airway infection from June 2015 to June 2016. All the patients were classified into wheezing (135 cases) and non-wheezing (71 cases) groups according to the symptom and sign of wheezing.

Results

Sixty-four patients (31.1%) showed positive culture result and 70 isolates were collected in this study. The top three bacterial collected were Streptococcus pneumonia (31/70, 44.3%), Escherichia coli (12/70, 17.1%) and Klebsiella pneumonia (10/70, 14.3%). The total detection rate of bacteria had no significance between two groups ($\chi^2=2.568, \ p=0.109$). However, the carry rate of Streptococcus pneumonia was higher in wheezing group than that of non-wheezing group ($\chi^2=5.432, \ p=0.02$).

Conclusions

The characteristic of nasopharyngeal bacterial distribution is different between the children with wheezing and without wheezing. The colonization/infection of Streptococcus pneumonia in children may contribute to the occurring of wheeze and the mechanism is not clear yet.
POLYMORPHONUCLEAR LEUKOCYTES ENHANCED BIOFILM DEVELOPMENT OF MUCOID PSEUDOMONAS AERUGINOSA
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Background and aims

P. aeruginosa is an opportunistic pathogenic bacterium involved in many human infections. P. aeruginosa biofilms would be resist to antibiotics and evade the destruction of PMNs, which lead to persistent infections. In previous study, PMNs demonstrate the effect on wild type P. aeruginosa biofilm development. As P. aeruginosa strains isolated from the lungs of chronic infection were most in mucoid colony morphology which demonstrated more difficult to be removed. However, the effect of PMNs and their ROS by-products on mucoid P. aeruginosa biofilm development have not been studied yet. Here we explored the effect of PMNs and the ROS by-products on the mucoid P. aeruginosa biofilm development and the underlying mechanism in vitro.

Methods

Mucoid P. aeruginosa FRD1 biofilm formation, alginate production and expression of genes involved in alginate synthesis were detected with the effect of PMNs or H₂O₂.

Results

The biofilm formation were promoted, and the alginate production and expression of genes of involved in mucoid P. aeruginosa alginate were elevated with the administration of PMNs or H₂O₂ for a day or 3 days.

Conclusions

Persistently recruiting PMNs or H₂O₂ derived from the oxidative burst can enhance the development of mucoid P. aeruginosa biofilms rather than removing it. Suppressing the excessive oxidative respiratory burst of PMNs may be a promising to eliminate the biofilm infection of mucoid P. aeruginosa. It explores that it is possible to use antioxidants and anti-inflammatory agents as preventive and therapeutic measures in CF patients with P. aeruginosa infections.
Background and aims

The establishment of normal intestinal flora in premature infants is closely related to immune function, allergic diseases and immune-related diseases. However, intestinal flora in the early establishment process, will be affected by many factors, such as gestational age, mode of production, feeding methods, and the studies about early using of antibiotics’ influence on intestinal flora in premature infants was less.

Methods

Collected 33 preterm infants’ feces who hospitalized in our NICU, according to whether the early (within 1 week after birth) application of antibiotics and the numbers of antibiotics are divided into four groups. Including no antibiotics; application of penicillin antibiotics; application of one cephalosporin and one penicillin antibiotics; application of two cephalosporins antibiotics. Which application of penicillin antibiotics and the application of one cephalosporin antibiotics according to different modes of delivery groups were divided into two subgroups. Every child was collected the stool from three times respectively, including the first day after birth, 10-14 days, 21-30 days.

Results

The overall content and diversity of intestinal flora in premature infants was low. On the level of phylum, mainly proteobacteria and Firmicutes.

Conclusions

In short, the establishment of preterm neonates’ normal intestinal flora is poor. In the abundance and diversity of bacteria, application of two kinds of cephalosporins antibiotics than no application or application of one cephalosporin antibiotics group was significantly reduced. After using of antibiotics, the normal intestinal flora has been reduced (Escherichia coli, Klebsiella and Clostridia), Paenibacillus increased, may increase the risk of inflammatory bowel disease in the late stage.
THE CORRELATION BETWEEN THE INTESTINAL MICROFLORA AND CD4+CD25+TREG/ TH17 CELL IN CHILDREN WITH HENOCH-SCHONLE PURPURA

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Background and aims

To observe alteration of intestinal micro flora, and regulation of CD4⁺CD25⁺Treg/CD3⁺CD8⁻IL-17⁺(Th17) cell in children with Henoch-Schonlein purpura.

Methods

41 children with Henoch-Schonlein purpura (HSP) and 30 healthy children were enrolled into this study. Flow cytometry (FCM) was performed to detect the percentage of CD4⁺CD25⁺Treg and CD3⁺CD8⁻IL-17⁺ (Th17) cell; Reverse transcription-polymerase chain reaction (RT-PCR) was used to analyze the mRNA expression of Foxp3 and ROR-yt in peripheral blood mononuclear cell (PBMC). 16S rDNA fluorescent quantitative PCR was applied in determining the amount of bifidobacterium, lactobacillus, escherichia coli and enterococcus in feces.

Results

The amount of bifidobacterium, lactobacillus and B/E declined, the percentage of Th17 cells and the expression of ROR-yt mRNA increased, the percentage of CD4⁺CD25⁺Treg, the expression of Foxp3mRNA, and CD4⁺CD25⁺Treg/Th17 ratio decreased in acute stage of HSP. During the recovery stage, the amount of bifidobacterium, lactobacillus increased gradually but B/E still declined. The percentage of Th17 and the expression of ROR-yt mRNA decreased and the percentage of CD4⁺CD25⁺Treg and Foxp3mRNA increased gradually, but CD4⁺CD25⁺Treg/Th17 ratio still declined. B/E had positive correlations with CD4⁺CD25⁺Treg/Th17 ratio.

Conclusions

The intestinal dysbacteriosis occurred in acute stage of HSP. The imbalance of CD4⁺CD25⁺Treg/Th17cells was involved in the pathogenesis of HSP. To maintain the balance of gut micro ecology is very importance in restoration of the immune homeostasis and tolerance induction.
INFLIXIMAB CORRECTS GUT MICROBIAL DYSBIOSIS OF PEDIATRIC PATIENTS WITH CROHN’S DISEASE, BUT IS UNDERPOWERED TO ENRICH MULTIPLE SCFA-PRODUCING BACTERIA

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Background and aims

Crohn’s disease (CD) is known to be associated with gut microbial dysbiosis. Infliximab (IFX) is increasingly used to treat pediatric CD. The aim of this study is to characterize the gut microbiota community composition in pediatric CD patients and access its dynamic changes during infliximab maintenance treatment.

Methods

16S rRNA gene sequencing was utilized to compare the fecal bacterial community composition of pediatric CD patients before and after infliximab treatment with healthy control subjects.

Results

Through metataxonomic analysis of the V3–V4 regions of bacterial 16S ribosomal DNA, we investigated the fecal microbiota in a cohort of pediatric CD individuals demonstrating a reduced diversity and an altered structure in the gut microbial community. The fecal microbiota showed a decrease in the level of SCFA-producing bacteria Blautia, Coprococcus, Faecalibacterium, Lachnospira, Odoribacter and Roseburia in the pediatric CD subjects before IFX treatment, while aggressive genus Enterococcus were significantly increased. Furthermore, different metabolic pathways were enriched in the fecal microbiota of healthy and CD patients. IFX treatment shifted the gut microbiota composition and functions of the pediatric CD patients toward healthy status, which maintained during the period of treatment. However, multiple SCFA-producing bacteria were not increased to the health control levels.

Conclusions

The imbalance in the microbial community was observed, significantly reflected the intestine dysbiosis. IFX treatment diminished the CD associated gut microbiota dysbiosis, but was underpowered to enrich some SCFA-producing bacteria. These results underscore the requirement of expanding SCFA-producers during IFX treatment in order to reduce the risk of recurrence or loss of response.
Guillain-Barré syndrome (GBS) is the most frequent cause of acute paralytic neuropathy. The exact cause of GBS is unknown, but 50-70% of cases appear after a respiratory or gastrointestinal infection. The authors aim to analyze the association between GBS and infectious disease.

Observational descriptive study of children with GBS, between 2007 and 2017 in a Portuguese pediatric hospital. Demographic, clinical and laboratory parameters were studied.

We identified 30 patients, with median age of 5.3 years at admission. Ribatejo, in the center of Portugal had the highest number of cases (23.3%). There was a previous disease in 66.7% of cases. The electromyogram identified a demyelination pattern (24), an exclusively motor axonal pattern (3), a mixed motor and sensory axonal pattern (2) and a sensory pattern (1). An etiologic agent was identified in 15/30 (50%) patients: Epstein-Barr virus (3), Cytomegalovirus (2), Borrelia (2), Influenza A-H1N1 (2) and others (Campylobacter, Mycoplasma pneumonia, Leptospira, Varicella-zoster virus, Enterovirus, Rhinovirus). A demyelinating polyneuropathy was associated with Epstein-Barr virus, Cytomegalovirus, Mycoplasma pneumonia, Leptospira, Varicella-zoster and Influenza A-H1N1 (9/24), motor axonal with Campylobacter and Borrelia (2/3) sensory pattern with Cytomegalovirus (1/1) and Miller Fisher with Epstein-Barr virus (1/2).

No statistically significant differences between infectious and noninfectious etiologic subgroups were found for sex (p=0.409), median age (p=0.529), geographical region (p=0.701), antiganglioside antibodies (p=0.602), pain (p=0.419) and average recovery time (87.1 vs 94.3 days; p=0.612).

The exact cause of GBS remains unknown. Prospective, multicentric studies are needed to compare patients with infectious etiology confirmed with the remainder, in a larger sample size.
EXPRESSIONS OF PEROXISOME PROLIFERATOR-ACTIVATED RECEPTORS Γ(PPARΓ) MRNA IN CHILDREN WITH KAWASAKI DISEASE
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Background and aims
To explore the changes of PPARγ mRNA expressions in children with Kawasaki disease (KD).

Methods
Forty-five children Aged 0.17-6 (1.9±1.54) years with KD were enrolled. Of which, There were 18 cases with coronary artery lesion (CAL) and 27 cases of non-CAL. Twenty healthy children were chosen as the control group. The PPARγ mRNA expressions at the acute phase, subacute phase and convalescent phase of the patients were detected by RT-PCR.

Results
① PPARγ expression levels of non-CAL group from the acute phase to recovery phase were obviously increased than that of CAL group and control group(all P<0.05); ② PPARγ expressions levels in CAL group at acute and subacute phases were significantly lower than control group (P<0.05), while that at convalescent phase were normal. ③ PPARγ expressions was significantly negative correlated with blood Platelet, coronary artery lesion (P <0.05).

Conclusions
The high levels of expression of PPAR-γ mRNA may be the result of Anti-inflammatory effect in children with Kawasaki Disease, and the lower expression of PPAR-γ mRNA is closely related with the occurrence of coronary artery damage.
Association of Single Nucleotide Polymorphism (rs1501299 and rs2241766) on Adiponectin QQ with Kawasaki Disease and Coronary Artery Lesions

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Background and aims

To investigate the association of single nucleotide polymorphism (SNPs) (rs1501299 and rs2241766) on Adiponectin (ADP) gene with Kawasaki disease (KD) and coronary artery lesions (CALs).

Methods

Eighty-one patients with KD including 11 cases had CALs (CAL subgroup), were selected as the case group, and 100 healthy age-matched children were selected as the control group. The SNPs (rs1501299 and rs2241766) on ADP gene were studied by gene sequencing.

Results

(1) There were statistically significant differences of genotype distribution ($\chi^2=9.139, \ P=0.010$) and allele frequency distribution ($\chi^2=37.345, \ P=0.000$) of SNP rs1501299 on ADP gene between the KD group and the controls; There were significant differences of genotype distribution ($\chi^2=7.700, \ P=0.045$) of SNP rs1501299 on ADP gene between the CAL subgroup and the non-CAL subgroup, but no difference of allele frequency distribution between the two subgroups ($\chi^2=3.355, \ P=0.067$). (2) There were no significant difference in the genotype distribution ($\chi^2=0.259, \ P=0.878$) and allele frequency distribution ($\chi^2=2.088, \ P=0.148$) of SNP rs2241766 on ADP gene between the KD and the controls, and no significant difference of that between two subgroups (the genotype $\chi^2=0.762, \ P=0.683$; the allele frequency $\chi^2=0.107, \ P=0.744$).

Conclusions

The SNP rs1501299 on Adiponectin gene may be associated with the development of KD and CALs in Han Chinese children, but SNP rs2241766.
THE EFFECT OF PRE-PREGNANCY MCMV INFECTION ON NORMAL AND LPS STIMULATED MICE AND THEIR OFFSPRING

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Background and aims

Maternal immune activation induced by infection can affect the cytokines secretion, this may lead to neurodevelopmental dysfunction. Will CMV infection before pregnancy affect the cytokine levels in mother and offspring? We hope to shed some light on the question using animal models.

Methods

6-week-old mice were injected with 5 × 10³ PFU MCMV smith strain, one month later, the mice were mated with healthy male mice. Pregnant mice were sacrificed on the 18th day of gestation, called pre-pregnancy CMV infection group (p-CMV); mice injected with an additional lipopolysaccharides, LPS, on the 13th day of gestation, were called the double hit group; correspondingly, we set negative and positive controls. Fetal demise rate, fetus weight are calculate, HE staining of certain organs are used to access the maternal damage, cytokines are tested using ELISA.

Results

All groups have similar fetal demise rate and fetus weight. LPS stimulation cause some damage to maternal organs, especially placenta.

LPS group has a higher TNF-α level in mother and placenta, an abnormally higher IL-10 level in placenta, and elevated IFN-γ level in fetus brain. TNF-α and IL-10 level are normal in double hit group. Interesting, p-CMV and double hit group had a much higher IL-10 than normal and LPS group.
Conclusions

Pre-pregnancy MCMV infection had little impact on pregnancy outcome, but LPS stimulation can cause the maternal inflammation and IFN-γ elevation in fetus brain, pre-pregnancy CMV infection may alleviate the inflammation caused by LPS and have a protective role in fetus brain development by increase the IL-10 in fetus brain.
LONG-TERM OUTCOME IN SURVIVORS OF NEONATAL TETANUS FOLLOWING SPECIALIST INTENSIVE CARE IN VIETNAM
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Background and aims

Neonatal tetanus continues to occur in many resource-limited settings but there are few data regarding long-term neurological outcome from the disease, especially in settings with critical care facilities. In this study, we aimed to assess long-term outcome following neonatal tetanus in infants treated in a paediatric intensive care unit in southern Vietnam.

Methods

Neurological and neurodevelopmental testing was performed in 17 survivors of neonatal tetanus and 18 control children from the same communities using tools previously validated in Vietnamese children.

Results

The median age of children assessed was 36 months. 8 neonatal tetanus survivors and 9 community control cases aged < 42 months were tested using the Bayley III scales of Infant and Toddler Development (Bayley III-VN) and 8 neonatal tetanus survivors and 9 community controls aged ≥ 42 months were tested using the Movement Assessment Battery for Children. No significant reductions in growth indices or neurodevelopmental scores were shown in survivors of neonatal tetanus compared to controls although there was a trend towards lower scores in neonatal tetanus survivors. Neurological examination was normal in all children except for two neonatal tetanus survivors (12%) with perceptive deafness and one child with mild gross motor abnormality. Neonatal tetanus survivors who had suffered from severe disease (Ablett grade ≥ 3) had lower total Bayley III-VN scores than those with mild disease (15 (IQR 14-18) vs 24 (IQR 19-27), p=0.05).

Conclusions

Neonatal tetanus is associated with long-term sequelae in those with severe disease. In view of these findings, prevention of neonatal tetanus should remain a priority.
EVALUATION OF USEFULNESS OF OBSERVATION SCALE AND INFLAMMATORY BIOMARKERS TO PREDICT INFECTIOUS DISEASES IN FEBRILE INFANTS LESS THAN 100 DAYS OLD

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Background and aims

To evaluate the usefulness of observation scale and inflammatory biomarkers including C-reactive protein, procalcitonin and ESR to predict the infectious diseases in febrile infants less than 100 days old in population immunized well with protein-conjugated pneumococcal and haemophilus type b vaccines.

Methods

The subjects were 35 febrile infants aged less than 100 days. Prediction factors including Yale observation scale(YOS) and inflammatory biomarkers like C-reactive protein, procalcitonin and ESR were assessed at admission. The correlations among prediction factors and the mean values of the factors by presence of infection were analyzed.

Results

There were 13 cases of urinary traction infection(UTI) and 20 cases of respiratory viral infection. There was no bacteremia or bacterial meningitis in this study. Among the prediction factors, there was only positive correlation between the values of procalcitonin and C-reactive protein(r=0.77). The YOS was not correlated with any biomarkers. Sensitivity, specificity, positive predictive value(PPV) and negative predictive value(NPV) of YOS with cut-off >10 for UTI were 15.4%, 100%, 100% and 68.6% respectively. All biomarkers were significantly elevated in UTI. In respiratory viral infections, there weren’t significant difference of mean values of prediction factors by infection and sensitivity, specificity, PPV and NPV of YOS with cut-off >10 were 9%, 100%, 100% and 42.9% respectively.

Conclusions

In present population immunized well, classical observation scale isn’t likely to be useful tool to screen or exclude the serious bacterial infection in infants less than 100 days old, but the patient with elevated YOS needs further work up and aggressive treatment.
ANTI-CYTOKINE AND ANTI-ENDOTOXIN THERAPIES FOR MENINGOCOCCAL DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives To compare the effectiveness and toxicity of anti-cytokine and anti-endotoxin for meningococcal disease.

Methods We searched CENTRAL (2016, Issue 7), MEDLINE (1948 to July, 2016), EMBASE (2010 to July 2016) and the Chinese Biomedical Literature Database (1978 to July, 2016). We screened reference lists of included studies. Randomized controlled trials (RCTs) and quasi-RCTs reporting comparisons of toxicity of anti-cytokine and anti-endotoxin for meningococcal disease were selected for inclusion irrespective of publication status or language. Two review authors independently selected trials from search results, assessed trial quality and extracted relevant data for inclusion in the review. We assessed methodological quality using the Cochrane risk of bias tool. Results were expressed as risk ratios (RR) with 95% confidence intervals (CI) or number needed to treat to benefit (NNTB) for dichotomous outcomes and mean difference (MD) with 95% CI.

Results Two trials (660 participants) met our inclusion criteria. Most of the outcomes had a moderate level of bias. There were no significant differences in mortality from meningococcal disease (RR 0.71, 95% CI 0.49 to 1.03), NNTB 20; number of participants with any complications (RR 0.68, 95% CI 0.43 to 1.08), NNTB 12; and long-term complications (RR 0.76, 95% CI 0.57 to 1.01), NNTB 17 between anti-endotoxin versus placebo.

Conclusions The quality of evidence does not support the use of anti-endotoxin in the treatment of meningococcal disease. Outcomes from large parallel RCTs are needed to better inform clinicians regarding the use of anti-endotoxin or anti-cytokine for meningococcal disease. Patient-centred outcomes should be considered for inclusion in future studies.
Objective: The cause of chronic diarrhea in infants is so wide that it is difficult to identify the accurate cause, which bring difficulties to the treatment. The etiology of this disease is discussed mainly in combination with the performances under colonoscopy.

Methods: Selecting 102 infants with chronic diarrhea in the ward of digestive infection of the Gansu Provincial Maternity and Child-care Hospital as the research object. These infants were performed stool routine, cultured, food specificity IgG antibody, colonoscopy, histopathological examination, etc, and the results were analyzed.

Result: Although the pathologic manifestation of infants with chronic diarrhea was mainly characterized by neuter cell and lymphocytic infiltration, the primary factor causing this disease was found to be allergic in combination of food specificity IgG antibody detection and undercolonoscopy manifestation and diagnostic treatment results.

Conclusion: Food allergic may be an important cause of chronic diarrhea in infants. Strengthening the detection means of chronic diarrhea and treating the disease after finding specific causes can improve the cure rate.
ASSESSMENT OF ANAEROBIC BLOOD CULTURES IN PEDIATRIC PATIENTS

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Background and aims

The most valuable test for the laboratory diagnosis of bacteraemia and sepsis is blood culture (BC). There is no uniform standard for children’s blood culture at home and abroad. The aim of this study was to analyze bacterial spectrum, the detection rate of the pathogens and the characteristics of group detected from paired aerobic/anaerobic blood culture.

Methods

The data was retrospectively analyzed for 6314 anaerobic blood culture bottles from January 2014 to December 2014 in Beijing children’s hospital. 6023 pairs of aerobic and anaerobic cultures were submitted to the clinical microbiology laboratory. The clinical data were collected, including gender, age, department, underlying disease.

Results

1. For 6023 pairs of aerobic and anaerobic cultures, 418 people were positive, the total positive rate of 6.9%. For only aerobic culture, the positive rate was 5.6%. For only anaerobic culture, the positive rate was 3.6%.
2. For pathogens, the patients with bacteremia due to enterobacteriaceae tended to have higher rates of isolation only using anaerobic bottles in which there was significant difference \( P=0.003, <0.05 \), according to whether the blood culture isolate was detected from the anaerobic blood culture bottle only or by aerobic culture.

Conclusions

The patients with bacteremia due to enterobacteriaceae tended to have higher rates of isolation only using anaerobic bottles. Anaerobic bottles could be processed in this group of patients.
ASSESSMENT OF TWO-SITE BLOOD CULTURES IN PEDIATRIC PATIENTS
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Background and aims

To evaluate the detection rate of two-site blood cultures in pediatric patients.

Methods

The data was retrospectively analyzed for 1985 hospitalized children with blood cultures from January 2013 to February 2015 in department of infectious diseases of Beijing children’s hospital, including blood culture collection, the administration of antibiotics prior to obtaining blood cultures and positive rate of blood culture. It is divided into three stages according to blood culture collection. Blood culture of single bottle refers to the blood culture of a aerobic bottle. Double bottles transition stage means two blood samples were taken from the same skin puncture point and the aerobic bottle culture was carried out at the same time. Two-site blood cultures means two blood samples were taken from the different skin puncture point and the aerobic bottle culture was carried out at the same time. The interval time between the two blood cultures should be less than 5 minutes.

Results

More than 80 percent of the children in the three stages were given antibiotics. There was no significant difference in the true positive rate ($P> 0.05$). In terms of false positive rate, blood culture of single bottle is higher than two-site blood cultures ($P < 0.05$). False-positive strains were common for coagulase-negative staphylococci.

Conclusions

For children (non-neonates), two-site blood cultures can reduce the false positive rate of blood culture and play a role in bacteria identification.
ONE CASE OF CLINICAL PHENOTYPE AND GENETIC MUTATIONS OF A PEDIGREE OF FAMILIAL HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS AND HODGKIN LYMPHOMA
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To analyze mutations in a pedigree of familial hemophagocytic lymphohistiocytosis (FHLH) and hodgkin lymphoma (HL), and provide genetic counseling for the family.
ONE CASE OF HEREDITARY SPHEROCYTOSIS CAUSED BY ANK1 MUTATION
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To diagnose hereditary spherocytosis, we made a genetic blood disease gene screening in a child who was suspected suffering from hereditary spherocytosis, which could provide evidence for the diagnosis.
ANALYSIS OF CLINICAL FEATURES AND GENE MUTATIONS IN ONE GENEALOGY WITH
HYPER-IGM SYNDROME
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The study aimed to analyse the gene mutations of one genealogy with Hyper-IgM Syndrome (HIGM),
combined with the clinical characteristics, provide accurate etiological diagnosis and provide genetic
counseling for family members.
RECURRENT ORBITAL MYOSITIS AND STREPTOCOCCAL INFECTION
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Background and aims

Orbital myositis is an inflammatory disease of extraocular muscles. It is quite rare in children and may be oligosymptomatic or severe (in this case with ptosis and proptosis). The etiology often remains unknown.

Methods

Case Report

Results

A 14-year-old male had orbital myositis two years earlier and was treated with corticosteroid therapy with benefit. He also had a history of recurrent and frequent episodes of tonsillitis. He presented to the Emergency Department with ocular pain that worsened with eye movements, unilateral ptosis, proptosis and vertical diplopia with one week of evolution. Neurologic examination was otherwise normal. He reported tonsillitis not treated with antibiotics two weeks before this episode. The CT scan showed thickening of the rectus and levator palpebrae muscles of the right orbit with heterogeneity of the retrobulbar fat tissue and thickening of the rectus of the left eye. The autoimmunity study was normal and the serological investigation confirmed streptococcal antecedent infection with anti-streptolysin O titer (ASLO) 1200UI/ml and Dnase B 824UI/ml. He was medicated with cefuroxime and prednisolone with a favorable evolution. Two months later ASLO values were 781UI/ml and Dnase B values were 688UI/ml, the decrease in antibody titers confirmed a previous acute infection.

Conclusions

We describe orbital myositis associated with serological evidence of recent streptococcal infection and no other etiology documented. This case suggests a possible post-streptococcal immune mechanism for this disease. As other manifestations of the post-streptococcal syndrome, orbital myositis appears to have an immune mechanism of lesion an, as such, could be explained in this context.
WHOLE GENOME SEQUENCING IDENTIFIES ENRICHED MUTATIONS AT METABOLISM PATHWAYS IN TWO REFRACTORY EBSTEIN-BARR VIRUS ASSOCIATED HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS CHILDREN

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Background: Epstein-Barr virus associated hemophagocytic lymphohistiocytosis (EBV-HLH) has caused serious concern in both Asian and Western countries. Some EBV-HLH cases have been classified to hereditary immunodeficiency diseases. However, for most EBV-HLH patients, no mutation was found. Controversy still remains among physicians regarding the treatment choice for EBV-HLH, especially at the beginning of the disease. Thus new methods are needed to avoid the excessive therapy on EBV-HLH patients.

Methods: Two patients presented with clinical features of refractory EBV-HLH were included in this study, and had no mutations in the PRF1, UNC13D, STX11, SH2D1A, XIAP, and ITK genes. Whole genome of the two patients were sequenced to over 70X with approximately 917M and 738M pairs of 2x150 nt reads sequenced respectively. DNA-seq reads were aligned to human genome (hg19) with BWA (v0.6.2-r126) BWA-MEM algorithm. Standard GATK workflow (Version 3.3) was used to discover variants and evaluate genotype calls from properly aligned reads. Multiple filters were applied to get more reliable candidate sites. Next we used ANNOVAR to annotate the function of genomic variants based on their position within coding regions and regulatory regions. We used R package KEGGProfile to map these genes to the KEGG pathways and found out the significantly enriched pathways.

Results: Both samples were sequenced in depth (92X and 73X) with about 917M and 734M pairs of 150 nt reads. Over 99.5% reads were aligned to the human genome with BWA and over 93.3% reads were uniquely aligned with high mapping quality. We found a total of 4,634,868 and 4,583,131 raw variants in two children, respectively. Functional annotations of whole genome variants followed by pathway enrichment analysis suggest that the mutations are mainly related to metabolism, especially fatty acid degradation pathways. Our functional annotation found a novel homozygous mutation (chr1: 41644771, AACAAAACAA insertion) shared in both Patients at the regulatory regions of FOXO6.

Conclusions: Our results suggested that FOXO signaling pathway might relate to the cause of HLH in multiple aspects, especially through functioning in regulating metabolism pathways.
THE ASSESSMENT OF CLINICAL FEATURES, LABORATORY FINDINGS AND THE PROGNOSIS OF VIRAL MENINGOENCEPHALITIS CASES

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Background and aims

Viral meningoencephalitis is an infectious disease with high morbidity and mortality rates. In this study we aimed to find out the probability of earlier diagnosis of the patients who are preliminary diagnosed of viral meningoencephalitis and have CSF examination for viral panel, by also considering their clinical and laboratory findings.

Methods

In this study, we included 69 patients, who visited Istanbul Medical Faculty, Child Health and Diseases between July 2013-July 2016 and had CSF viral panel examination because of preliminary diagnose of viral meningoencephalitis. Clinical signs and symptoms, laboratory test results, CSF and neuroimaging findings were analyzed retrospectively.

Results

The ages of the patients ranged from 1.5-275 months, 25 (36.2%) were female, 44 (63.8%) were male. The most common symptoms and signs of patients were fever and altered mental state. In 20.3% of patients in the CSF examination viral agents were detected. While the most common detected viral agent was enterovirus (n= 5, 35.7%); HSV-1 (n=4, 28.5%), HHV-6 (n: 2, 14.2%), HHV-7 (n: 1, 7.1%), CMV (n: 1, 7.1%) were the other detected viral agents. In one patient’s CSF examination, both HHV-6 and HSV-1 were detected. The presence of focal neurological symptoms at first visit was higher among HSV-1 positive patients.

Conclusions

Meningoencephalitis is a severe infectious disease which requires a comprehensive and systematic approach as well as it should be diagnosed and treated immediately. In CSF samples, detection of the virus which causes the encephalitis is very significant for determining the duration of treatment and may affect the prognosis directly.
DETECTION AND ANALYSIS OF THE PLACENTA MICROBIOTA OF NORMAL TERM DELIVERY

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Background and aims

To study the composition of the placenta microbiota of normal term delivery.

Methods

3 placenta specimens were collected from full-term infant birth by normal spontaneous delivery. The flora DNA were extracted by Tissue Kit for 16SrRNA gene high-throughput nucleotide sequencing, then the sequencing results were analyzed.

Results

The placenta microbiota of normal spontaneous delivery at the bacterial phylum level show five bacterial phylum are detected including Proteobacteria, Unclassified Bacteria, Actinobacteria, Firmicutes and Bacteroidetes. Proteobacteria is main parts of bacteria and more than 90 percent in the placenta microbiota. At the genus level, 24 bacterial genus are detected including Proteobacteria, Actinobacteria and Firmicutes. Halomona, Pelagibacterium and Unclassified Phyllobacteriacea of Proteobacteria genus are main bacterial genus in the placenta microbiota. Actinotalea, Escherichia/Shigella, Sphingomonas, Bacteroides, Streptococcus, Klebsiella, Bifidobacterium, Clostridium and Staphylococcus.

Conclusions

It is discovered that there are not poor in the bacterial flora colonized in the normal and term placenta.
THE INFLUENCE OF ROOMING-IN CARE HOSPITAL PATTERN IN THE NEONATAL WARD ON PHYSICAL AND MENTAL HEALTH OF MOTHER AND INFANT

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Background and aims

To investigate the meaning of rooming-in care hospital pattern opened in neonatal ward

Methods

The cases with relatively stable vital signs enrolled from neonatal ward of Beijing New Century International Children’s Hospital between March 2012 and May 2013 were divided into rooming-in group and non rooming-in group according to parents’ will and beds, then compared the rate of hospital infection, breastfeeding, mother postpartum depression scores in first month after giving birth, hospital discharge rate of non doctor’s advice and followed-up problems occurred after discharge from hospital.

Results

(1) The incidence of hospital infection was 2.3% (3/132) and 1.4% (1/70) respectively in the group of rooming-in and non rooming-in, there was no significance between the two groups (P > 0.05). (2) Breastfeeding: There were no significant differences between two groups before admission (P>0.05). The artificial feeding rate of rooming-in group (8.3%, 11/132) was significant lower than that of non rooming-in group (58.6%, 41/70) (P < 0.01) after admission. (3) Edinburgh postnatal depression scale score of rooming-in group (40 cases were selected) was 4.6±3.0, while that of non rooming-in group (24 cases were selected) was 6.8±2.7. The difference was statistically significant (P < 0.01). (4) The hospital discharge rate of non doctor’s advice of rooming-in group(4.5%, 6/132) was less than that of non rooming-in group (12.9%, 9/70) with statistical difference (P < 0.05).

Conclusions

When illness conditions permit, rooming-in care hospital pattern in the neonatal ward contributes to the physical and mental health of mother and infant. It meets with the current medical service development direction
RESPIRATORY PATHOGENS MONITORING AND CLINICAL COURSE IN CHILDREN WITH ASTHMA: A PROSPECTIVE STUDY

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Background and aims

In the current study, we sought to track the clinical course of children under control-based asthma management and focused on respiratory pathogens monitoring. We prospectively explored influencing factors for asthma control.

Methods

One hundred and twenty-one children with uncontrolled asthma between 3-14 years of age were recruited. Common respiratory pathogens were detected with pharyngeal swabs and serum aeroallergen-specific IgE was measured. Numeric asthma control scores, airway resistance and fractional concentrations of exhaled nitric oxide (FENO) were evaluated. A proper control-based asthma management plan was established by the study physician. Regular reviews were performed, with the above measurements retested at set time intervals.

Results

The proportion of patients achieving asthma control at 1 month and 3 months were 59% and 76% (P=0.013). These patients exhibited significant improvement in numeric scores and lung function parameters. The prevalence of common respiratory pathogens did not significantly differ between reviews. The number of sensitized aeroallergens significantly increased with age (r=0.235, P=0.010). Children with a high visual analogue scale (VAS) score for asthma at baseline were less likely to achieve asthma control after 1 month, while those sensitized to more aeroallergens were more likely to achieve asthma control after 1 month (P = 0.016 and 0.012).

Conclusions

In summary, children with asthma showed significant improvements in control rates and lung function during control-based asthma management, independent of respiratory pathogens testing results. Patients with high VAS scores and fewer sensitizations to aeroallergens had difficulty achieving short-term asthma control.
REYE SYNDROME IN AN INFANT WITH PRIMARY CARNITINE DEFICIENCY TRIGGERED BY ANTIFEBRILE SUPPOSITORY

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Background and aims

Fever is a common symptom in children with infectious diseases. Primary carnitine deficiency is a rare inherited metabolic disease. Antifebrile suppository is a trigger of Reye syndrome in the children with underlying metabolic disorders. In this study, we analyzed the clinical manifestation, diagnosis and treatment of an infant with Reye syndrome.

Methods

A girl visited us at the age of 6 months. The previously normal baby presented with fever for 20 hours and lethargy. When her temperature reached 38.6°C, an antifebrile suppository was used. Just half an hour later, the girl got coma and convulsions. To investigate the etiology, her urine organic acids, blood amino acids and carnitine profiles were analyzed.

Results

The girl had severe hypoglycemia (0.6 mmol/L), ketosis, metabolic acidosis, hepatic insufficiency and hepatomegaly. Abdominal CT scan revealed severe fatty liver. Reye syndrome had been considered. Her brain CT scan and MRI scan were normal. Blood amino acids were normal. Urine glutaric acid was slightly increased. Significantly decreased blood carnitine (9 μmol/L, normal range 15-60 μmol/L) indicated carnitine deficiency. After the treatment of L-carnitine with low-fat diet, the girl recovered soon. Two weeks later, her liver function returned to normal.

Conclusions

Primary carnitine deficiency is a potentially fatal but treatable metabolic disorder. The patients present with complex heterogeneous phenotypes. Acute metabolic crisis in patients with underlying carnitine deficiency is usually triggered by febrile illnesses, hunger, fatigue, and drugs. Cardiomyopathy, muscle disease and liver damage are common. Some children had the onset of Reye syndrome. In this study, Reye syndrome occurred in the baby after using antifebrile suppository. Blood free carnitine and acylcarnitine profiles analysis is key for the etiological diagnosis. Neonatal screening is important for the early diagnosis. For children with unexplained encephalopathy and hepatopathy, inherited metabolic diseases should be considered.
CORRELATION OF RESPIRATORY PATHGEN INFECTION AND HENOCH-SCHONLEIN PURPURA IN CHILDREN
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Background and aims

To investigate the Correlation of respiratory pathgen infection and Henoch-Schonlein Purpura in local children, thus guiding the clinical treatment.

Methods

80 children (20 cases of each quarter) with HSP who were hospitalized from August 2012 to July 2013 in the affiliated hospital of Qingdao University were chosen as the HSP group, while choosing the healthy kids as the control group. Peripheral venous blood were sampled and centrifuged to get serum. Scatter turbidimetry was used to measure the serum level of ASO, while indirect immunofluorescence was used to test the IgM antibodies of nine respiratory pathogens (legionella pneumophila, mycoplasma pneumoniae, coxiellaburnetti, chlamydia pneumoniae, advenovirus, respiratory syncyntial virus, influenza A virus, influenza B virus, parainfluenza virus), than made a statistical analysis by chi-square test.

Results

① There was statistically significant difference between the two groups with respiratory pathgen infection rates. ② The infection rate of mycoplasma pneumoniae, legionella pneumophila, influenza B virus are significantly higher than the normal control group, there was significant difference between them (χ² =5.625, 4.444, 7.059, P<0.05). ③ There was various pathgen associated with HSP in different seasons, the mycoplasma pneumoniae and influenza B virus infection rate in winter, influenza B virus infection rate in Autumn are significantly higher than the normal control group, there was significant difference between them (χ² =3.956, 4.800, 5.625, P<0.05), while other pathgens infection compared no significant difference in different seasons (χ² =0.021 ~1.308, P>0.05).

Conclusions

The incidence of respiratory infection is closely related to HSP, mycoplasma pneumoniae, legionella pneumophila and influenza B virus infection are closely related to native children with HSP.
WHOLE WISKOTT-ALDRICH SYNDROME PROTEIN GENE DELETION IDENTIFIED BY HIGH THROUGHPUT SEQUENCING

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Background and aims

Wiskott-Aldrich syndrome (WAS) is a rare X-linked recessive immunodeficiency disorder, characterized by thrombocytopenia, small platelets, eczema and recurrent infections associated with increased risk of autoimmunity and malignancy disorders.

Methods

Mutations in the WAS protein (WASP) gene are responsible for WAS. To date, WASP mutations, including missense/nonsense, splicing, small deletions, small insertions, gross deletions, and gross insertions have been identified in patients with WAS. In addition, WASP-interacting proteins are suspected in patients with clinical features of WAS, in whom the WASP gene sequence and mRNA levels are normal.

Results

The present study aimed to investigate the application of next generation sequencing in definitive diagnosis and clinical therapy for WAS. A 5 month-old child with WAS who displayed symptoms of thrombocytopenia was examined. Whole exome sequence analysis of genomic DNA showed that the coverage and depth of WASP were extremely low. Quantitative polymerase chain reaction indicated total WASP gene deletion in the proband.

Conclusions

In conclusion, high throughput sequencing is useful for the verification of WAS on the genetic profile, and has implications for family planning guidance and establishment of clinical programs.
THE CLINICAL MANIFESTATION AND GENE ANALYSIS OF MULTIPLE ACYL-COA DEHYDROGENASE DEFICIENCY WITH TRANSAMINASE INCREASED

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Background and aims

To study the Multiple acyl-coa dehydrogenase deficiency with transaminase increased in children with clinical manifestation, laboratory examination, muscle biopsy and gene mutation analysis, and carry on the literature review, provide the basis for the early diagnosis and treatment of the disease.

Methods

A male patient was diagnosed with Multiple acyl-coa dehydrogenase deficiency, to collect his clinical datas and results of the gastrocnemius muscle biopsy, meanwhile,using two generations of gene sequencing were to detect the pathogenic genes of children and parents.

Results

The muscle biopsy of the children showed a large amount of lipid deposition in the muscle fiber. The results of gene sequencing showed that the ETFDH gene of the child was present in c. 1773_1774 del AT p. (Cys592) unjustified mutation and c. 389A > T p. (Asp130Val) missense mutation, which was considered as a composite heterozygous mutation, and the parents were carriers.

Conclusions

Clinical transaminases associated primarily associated with elevated myocardial enzymes, movement disorders, and molecular genetics inspections should be as soon as possible, conditions gastrocnemius muscle biopsy, and can provide families with accurate genetic counseling and prenatal diagnosis.
THE EXPRESSION OF TOPK/PBK IN MALIGNANT LYMPHOMA AND LYMPH NODE HYPERPLASIA TISSUES IN CHILDREN

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Background and aims

To study the expression of TOPK/PBK between malignant lymphoma and lymph node hyperplasia tissues in children

Methods

To collect paraffin embedded tissues of 80 cases childhood malignant lymphoma and 20 cases reactive hyperplasia of lymph nodes.

Results

1. The male to female ratio was 3:1; the age of onset was more than 6 years old; the whole group of intralymph node onset was 51.25%, Out of lymph node onset was 48.75%; the expression of TOPK/PBK was not correlated with age, gender and location; 2. The positive expression rate of TOPK/PBK in lymphoma specimens was higher than that of reactive hyperplasia of lymph node specimens, the difference was statistically significant (χ²=4.967, P=0.026);

Conclusions

The expression of TOPK/PBK was up-regulated in children with malignant lymphoma.
BREAK-THROUGH BLEEDING IN RELATION TO PHARMACOKINETICS OF FACTOR VIII IN PEDIATRIC PATIANTS WITH SEVERE HEMOPHILIA A

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Background and aims

As the pharmacokinetics (PK) of factor VIII (FVIII) is individualized in children with hemophilia A (HA), PK parameters may be indicators of patients’ bleeding phenotype and instruction for their personalized replacement program. The aim of this study was to investigate the possible relationship between PK/FVIII level and bleeding frequency in Chinese pediatric patients with severe (HA).

Methods

A total of 24 patients were enrolled in Beijing Children's Hospital from February to October 2015, all of whom were given 50 IU/kg of FVIII concentrates after a 72-hour washout period. Samples' activities (FVIII:C) were tested at five time points, using WinNonlin software for PK testing, and then the individual half-life ($t_{1/2}$) and the time (h) of FVIII concentrations <1IU dL$^{-1}$ within a week during prophylaxis were calculated. Baseline and the annual bleeding rate (ABR), annual joint bleeding rate (AJBR) were recorded and analyzed.

Results

The mean $t_{1/2}$ of FVIII was 10.20±2.72 h and the mean time of FVIII<1IU dL$^{-1}$ in one week was 44.7 h (-38.56-102.33 h). A significant relationship between $t_{1/2}$ of FVIII and ABR$_0$/AJBR$_0$ (baseline bleeding) was found ($R^2=0.75$ and 0.62, $P<0.001$). Besides, ABR$_1$ and AJBR$_1$ during prophylactic treatment of hemophilia had a positive correlation with the time (hours) of FVIII<1IU dL$^{-1}$ in one week ($R^2=0.67$ and 0.52, $P<0.001$).

Conclusions

$t_{1/2}$ was an important indicator to prevent bleeding in severe HA; shortening the time of FVIII<1 IU dL$^{-1}$ according to $t_{1/2}$ would be expected to reduce the bleeding during prophylaxis in Chinese children with severe HA.
CHARACTERISTICS OF SERUM PROTEIN AND LIPIDS IN CHILDREN WITH PRIMARY NEPHROTIC SYNDROME BEFORE AND AFTER STEROID THERAPY

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Background and aims

To evaluate the characteristics of serum protein and lipids in children with primary nephrotic syndrome (PNS) before and after steroid therapy, and to provide references for diagnosis and treatment of PNS children.

Methods

The serum biochemical test results of PNS children were collected. Changes of serum total protein (TP), albumin (ALB), triglyceride (TG), total cholesterol (CHO), high density lipoprotein cholesterol (HDL-C), and low density lipoprotein cholesterol (LDL-C) were evaluated before and after steroid therapy. Response to steroid therapy of each index was also analyzed.

Results

Abnormally changed serum proteins and lipids before therapy in PNS children hand been significantly improved (TP t=2.994, P=0.0055; ALB t=2.950, P=0.0090; TG t=-3.687, P=0.0020; CHO t=-5.094, P<0.0001, HDL-C t=-3.509, P=0.0009, LDL-C t=-5.328, P=0.0002). ALB, CHO, TG and LDL-C showed better reactivity (ALB 72.22%, TG 76.47%, CHO75.00%, LDL-C 83.33%) to steroid therapy.

Conclusions

The characteristics of serum protein and lipids in patients with PNS before and after treatment can be used as an important basis to reflect the patient's condition and treatment effect. The concentration of serum ALB, TG, CHO and LDL-C has an important reference value for the evaluation of the treatment effect of PNS in children.
CLINICAL FEATURES OF KAWASAKI DISEASE CHILDREN WITH URINARY TRACT INVOLVEMENT
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Background and aims

To study the clinical characteristics of KD children with urinary tract involvement and to explore the prognosis.

Methods

Clinical data and laboratory indexes of the children with KD were collected retrospectively. The difference about clinical features and sensitivity to IVIG treatment in children with urinary tract involvement were analyzed.

Results

A total of 797 cases with complete informations were enrolled and 13.2% (n=105) were urinary tract involvement. The proportion of male and female was 2:1. 70.5% patients had white blood cells (several-full vision/HP). Early renal damage index in 9/19 (52.6%) increased. In 67 cases renal ultrasound results,3 cases showed bilateral renal enlargement and 5 cases were echogenicity enhanced. A total of 58 cases rechecked urine routine, 89.7% of them were normal within 1 week. The features of fever, swollen lymphnodes and the oral changes were more common in the urinary tract involvement group(n=105) than controls(n=98). The coronary vascular damage was no significant difference between two groups. The sensitive to IVIG was no significant difference, too.(16.2% vs. 7.2%,  P >0.05).

Conclusions

White blood cells in urine was often seen in the KD patients with urinary tract involvement. Usually, abnormal urine would recover within 1-2 weeks. The features of fever, swollen lymphnodes and the oral changes were more common in patients with urinary tract involvement. Coronary artery damage was no significant association with urinary tract involvement. The percent of unsensitive to IVIG was higher in the urinary tract involvement group, but with no significant difference.
APPLICATION OF MODIFIED STRONGKIDS NUTRITION SCREENING TOOL IN PEDIATRIC INPATIENTS

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Background and aims

Nutrition screening tool that is designed based on Chinese pediatric population is in need. This study investigated a modified STRONGkids Nutrition Screening Tool used in pediatric inpatients and the correlation between nutrition risk status and clinical outcome, in order to provide guidance for nutritional support.

Methods

Nutritional risk was screened in 885 children within 48 hours of admission. Modified STRONGkids nutrition screening tool was used on a scoring system. The prevalence of nutritional risk, and its correlation with length of stay, weight loss rate, hospitalization expense and nutrition interventional rate were analyzed by Pearson test. The nutrition status effectiveness of the screening tool was evaluated with reference to WHO’s normal child growth standard.

Results

The average nutrition screening score was of 1.4 ± 1.30 based on modified STRONGkids Nutrition Screening Tool. The nutrition risk between under 2 years old and above 2 years old was statistically significant different (P <0.01). Patients who received nutritional intervention were accounted for 54.9% of total children with high nutrition risk. Nutrition screening scores were significantly correlated with hospital stay (mean 5.8 days of hospitalization) and hospital cost (37626.6 ± 44608.27) (P <0.01), but not with weight loss (weight loss 0.2 kg ± 0.53) (P> 0.05). The nutrition screening tool was significantly associated with anthropometric measurements (P <0.01).

Conclusions

Nutrition screening scores were associated with clinical outcomes. The Modified STRONGkids nutrition screening tool is effectively reflected the nutritional risk of hospitalized children that provide evidence for further nutritional intervention.
CLINICAL EFFICACY OF CRANIAL ELECTROTHERAPY STIMULATION ON CHILDREN WITH TIC DISORDER
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Background and aims
To investigate the effect of cranial electrotherapy stimulation for tics symptoms.

Methods
26 patients with transient tic disorder (TTD), 28 with chronic motor or vocal tic disorder (CTD) and 21 with Tourette’S disorder (TS) received 60 sessions of cranial electrotherapy stimulation. The clinical effect was evaluated with Yale Global Tic Severity Scale.

Results
The patients with three types of tic disorder all showed a reduction of tics symptoms (TTD : 10.53±0.85 VS 5.79±4.87; CTD : 12.32±1.52 VS 4.00±2.23; TS : 25.56±2.79 VS 13. 65±4.11; P<0.01).

Conclusions
Cranial electrotherapy stimulation is an effective and valuable treatment in tic disorder especially in the patients with transient tic disorder and mild chronic motor or vocal tic disorder.
High Doses of Recombinant Mannan-Binding Lectin Inhibit the Binding of Influenza A(H1N1)pdm09 Virus with Cells Expressing DC-SIGN

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Background and aims

The pandemic H1N1 strain of influenza A virus [A(H1N1)pdm09] emerged in Mexico in 2009 and rapidly spread worldwide causing over 18,000 deaths. The virus currently circulates as a seasonal virus. We recently reported protective effect of mannan-binding lectin (MBL) against influenza A(H1N1)pdm09 infection in children. Further, low levels of mannan-binding lectin (MBL) may be a risk factor for severe influenza A(H1N1)pdm09 infection in children. To date, the influence of MBL on the influenza A(H1N1)pdm09 infection process is unclear. In adults, no association between MBL deficiency and influenza A(H1N1)pdm09 infection has been observed, while in children, MBL is protective against influenza A(H1N1)pdm09 infection. This study aim to explore whether high doses of recombinant mannan-binding lectin inhibit the binding of influenza A(H1N1)pdm09 virus with cells expressing DC-SIGN.

Methods

Immunoprecipitation of DC-SIGN and H1N1 virus overlay protein blot assay (VOPBA), Purified hMBL and rMBL preparation, Confocal detection and Flow cytometry.

Results

(1) Identification of DC-SIGN as one of the binding proteins between DCs and influenza A(H1N1)pdm09. (2) Inhibition of binding between DCs and influenza A(H1N1)pdm09 virus by high doses of hMBL/rMBL(≥5μg/ml). (3) Effect of anti-DC-SIGN antibody on the binding of influenza A(H1N1)pdm09 with DCs. (4) Binding of DC-SIGN+ THP-1 cells with influenza A(H1N1)pdm09, and inhibition of this binding by high doses of hMBL/rMBL and anti-DC-SIGN antibodies.

Conclusions

This study demonstrates that high doses of MBL can inhibit the binding of influenza A(H1N1)pdm09 virus to DC-SIGN expressing cells in the presence of complement, and that DC-SIGN might be an alternative receptor of influenza A(H1N1)pdm09 virus.
EFFECT OF GANCICLOVIR COMBINED WITH INTERFERON INHALATION IN TREATMENT OF CHILDREN INFECTIOUS MONONUCLEOSIS RELATED TO EBV
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Background and aims

To investigate the clinical effect of ganciclovir combined with interferon inhalation in treating children infectious mononucleosis(IM) related to EB virus.

Methods

TO select 99 children cases of IM related to EBV, they were divided into three groups randomly, 33 cases in each group. Choose three therapeutic methods, there are Ganciclovir (group A), ganciclovir + interferon inhalation (group B) and ganciclovir + interferon intramuscularly (group C). Compare the clinical symptoms remission time and the changes of laboratory indexes after treatment for 7 days between groups. Adverse reactions were observed in each group.

Results

The differences between B group and C group were not significantly different, and there was no statistical significance (P >0.05). Group B and C compared with group A, there were significant differences in time to defervescence, duration of isthmitis, and heterotypic lymphocytes disappeared time (P <0.05). EBV-DNA negative conversion rate and the cellular immune function was improved significantly than that of group A after treatment for 7 days (P <0.05). There were 2 cases of fever in the C group, and 1 case of granulocytopenia in each group.

Conclusions

The effect of ganciclovir combined with interferon inhalation or intramuscular injection in treating children IM related to EBV is in the same curative. It can improve clinical symptoms, cellular immune function and EBV-DNA negative conversion rate. Due to inhalation of less side effects and no pain, which can be accepted by children and their parents easily. It is therefore recommended that ganciclovir combined with interferon inhalation in the treatment of EBV related infectious mononucleosis.
THE ASSOCIATION BETWEEN MITOCHONDRIAL COMPLEXES ENZYME ACTIVITY AND PROGNOSIS IN SEPTIC CHILDREN

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Background and aims

To explore the relationship between mitochondrial complexes I + III enzyme activity of peripheral blood mononuclear cells (PBMC) and prognosis of septic children.

Methods

50 septic children aged from 1 month to 13 years treated in the emergency room and ICU of Capital Institute of Pediatrics and 50 healthy check-up children were enrolled in this study from January 2014 to December 2014. Complexes I + III activity of PBMC were assayed by fluorescence spectrophotometry.

Results

There were 38 boys and 12 girls. Complexes I + III activity of 14 cases lower than 498.9nmol/min.mg were included in low activity group, while the other 36 cases more than 498.9nmol/min.mg were included in normal activity group. Complexes I + III activity of low activity group were 284.32±127.96nmol/min.mg and 692.04±145.30nmol/min.mg respectively. The ALT, HBDH, CK, CKMB, glucose, WBC and CRP of low activity group were significantly higher than those of normal activity group (p=0.046, 0.045, 0.036, 0.003, 0.029, 0.042 and 0.038). The incidence of brain dysfunction, respiratory failure, liver failure, kidney damage, gastrointestinal bleeding and metabolic acidosis of low activity group were significantly higher than those of normal activity group (p=0.05, 0.049, 0.037, 0.047, 0.037 and 0.037). The proportions of increase of ALT, CK and CKMB of low activity group were significantly higher than those of normal activity group (p=0.037, 0.001, 0.017 and 0.030). The mortality rate in low activity group was significantly higher than that of normal activity group (57.14% vs 24.32%, p=0.027).

Conclusions

The risk of death increase while complexes I + III activity decrease in the cases of children with sepsis. This may be a reliable warning indicator of poor prognosis for septic children.
TO EXPLORE THE RELATIONSHIP AMONG COENZYME Q10 LEVEL AND ORGAN DISORDERS AND PROGNOSIS IN SEPTIC CHILDREN

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Background and aims

To explore the relationship among coenzyme Q10 level and organ disorders and prognosis in septic children.

Methods

50 septic children aged from 1 month to 13 years treated in ICU of Capital Institute of Pediatrics and 50 healthy check-up children were enrolled in this study from January 2012 to May 2014. Coenzyme Q10 level were assayed by high performance liquid chromatography (HPLC) method.

Results

Coenzyme Q10 level of septic group and healthy controls were 0.739±0.337 umol/L and 1.004±0.256 umol/L respectively, the level of septic children were obviously lower than healthy controls (t=-4.43, p <0.001). The level of 16 dead cases in septic group and 34 survived cases were 0.499±0.193 umol/L and 0.853±0.332 umol/L respectively, it is obviously lower than survived controls (t=-4.747, p <0.001). The risk of death increased when Coenzyme Q10 level below 0.493 umol/L (AUC=0.748, p=0.004; OR=8.403, CI 95% =1.082-65.246, P=0.043). Coenzyme Q10 level of 17 cases lower than 0.493 umol/L were included in low level group, while the other 33 cases more than 0.493 umol/L were included in normal level group. The proportions of increase ALT 4 times, AST 4 times, HBDH and LD were significantly higher than those of normal activity group (p=0.001, 0.016, 0.008 and 0.048). The incidence of heart failure and liver failure of low level group were significantly higher than those of normal level group (p=0.005 and 0.002). Coenzyme Q10 level had significant relationship with the incidence of death (r=-0.503, p<0.01). Logistic showed that low level of Coenzyme Q10 influenced prognosis in septic children (OR=10.267, CI95% =2.592-40.669).

Conclusions

The risk of organ disorders increased while Coenzyme Q10 level decrease in septic children. This may be a reliable warning indicator of poor prognosis for septic children.
CLINICAL CHARACTERISTICS AND ASL GENE MUTATION ANALYSIS OF ARGININOSUCCINIC ACIDURIA
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Background and aims

To study the clinical characteristics and pathogenicity of 1 patient with argininosuccinic aciduria.

Methods

A retrospective analysis the clinical data of one patient which blood tandem mass spectrometry performed to citrullineemia type 1. The peripheral blood of children and their parents was extracted for gene analysis. The exon was sequenced by Illumin second-generation sequencing.

Results

There were two mutations in ASL gene, which were exon 5: c.331C> T and exon 6: C.434A> G, respectively, inherited from mother and father.

Conclusions

The clinical characteristics and genotype of the children were diagnosed as argininosuccinic aciduria, the second-generation DNA sequencing technique was high in flux and highly sensitive, and it was suitable for genetic diagnosis of genetic metabolic diseases.
CLINICAL MANIFESTATIONS, PATHOLOGY AND GENE ANALYSIS OF DELAYED TYPE TYROSINEMIA 1
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Background and aims
To analyze the clinical features, liver pathology and gene expression of a delayed tyrosinemia type 1 (TH1).

Methods
One patient with delayed tyrosinemia type 1 was diagnosed by laboratory examination (liver function, blood amino acid analysis and gene sequencing). The clinical characteristics, pathogenesis, pathology and gene expression of delayed tyrosinemia type 1 were analyzed by literature.

Results
3 years and 2 months female, due to short stature, hepatosplenomegaly, physical examination with rickets performance, blood tandem mass spectrometry and urine organic acid analysis prompted tyrosinemia type I, liver pathological examination prompted early liver cirrhosis and gene analysis suggest that c.553 + 2T> C and c.837 + 1G> T heterozygous mutations in children.

Conclusions
Delayed tyrosinemia type 1 children may have short stature, late onset rickets, hepatosplenomegaly and hypophosphatemia, FAH gene detection of heterozygous mutation.
Background and aims

To investigate the clinical manifestation, imaging features, treatment methods and prognosis of exogenous lipid pneumonia in children, to improve the awareness of clinicians on rare diseases, reduce the misdiagnosis rate and improve the treatment methods.

Methods

The clinical data, imaging features, treatment and outcome were retrospectively analyzed in 36 patients with exogenous lipid pneumonia, who were hospitalized in our hospital from January 2009 to December 2016.

Results

All the children had a aspiration history of mineral oil, 21 cases inhaled machine oil, 4 cases inhaled gasoline, 3 cases inhaled white oil, 2 cases inhaled soapy water, 2 cases inhaled kerosene, 1 case inhaled silicone oil, 1 case Inhaled of paraffin oil, 1 case inhaled banana oil, 1 case inhaled hexane.6 cases choked when inhaling oil. 23 cases had prompted leukocytosis, 17 cases high sensitivity C-reactive protein increased, 5 cases calcitonin increased. 10 cases in the 24 hours after taking the chest X-ray examination showed no abnormalities, 28 cases within 48 hours of chest CT examination were found abnormal, early imaging features could found after 3 hours. All children received antibiotic therapy, 6 patients received systemic glucocorticoid therapy, 22 patients received alveolar lavage, 4 cases received infusion of gamma globulin needle. 31 children recoverd, 1 case death, 4 cases give up treatment.

Conclusions

The great mass of children with exogenous lipid pneumonia can find imaging changes in 48h, early chest CT examination can help diagnosis. Early bronchoscopy lavage treatment can reduce lung damage and improve the prognosis.
Effect and Mechanisms of MiRNA-146a on the Life Cycle of Hepatitis B Virus

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Background and Aims

To investigate the effect of microRNA-146a (miR-146a) on the life cycle of hepatitis B virus (HBV) and mechanisms.

Methods

The miRNA expression profile differences were compared by miRNA array between HepG2 and HepG2.2.15 cells, interested miR-146a was confirmed by RT-PCR. MiR-146a mimic and inhibitor were transfected into HepG2.2.15 respectively, followed by the quantification of HBV replication by RT-PCR, and protein expression levels by ELISA and western blot. Dual-luciferase reporter assay was used to detect the interaction between miR-146a and HS3ST3B1.

Results

Totally 72 miRNAs expression levels changed in HepG2.2.15 cells. The expression level of miR-146a in HepG2.2.15 was significantly higher than that in HepG2 (P<0.05). When miR-146a was transfected into HepG2.2.15 cells, the HBV replication and protein levels were significantly higher than control groups (P<0.05); Vice versa (P<0.05). Bioinformatics analysis showed HS3ST3B1 was a potential target of miR-146a. The reporter luciferase reporter system showed the reported fluorescence of HS3ST3B1 wild type vector was significantly lower than that in the control group (P<0.05). There was no significant difference in the fluorescence value between HS3ST3B1 mutant vector and control group (P>0.05). HepG2.2.15 were transfected with miR-146a mimic, compared with the control group, in the experimental group, the mRNA level of HS3ST3B1 was not significantly changed (P>0.05), and the level of HS3ST3B1 protein was significantly decreased (P<0.05).

Conclusions

This study confirmed miR-146a can affect the life cycle of HBV, further study of its mechanism found miR-146a may affect HBV life cycle by acting on HBV inhibitory factor HS3ST3B1 3'UTR and inhibition of its translation.
Candida species are the important pathogen in nosocomial blood stream infections (BSIs) in neonatal intensive care units (NICUs). Risk factors for candidemia include preterm, low birth weight, use of H2 blockers, steroids, prolonged use of broad-spectrum antibiotics, total parenteral nutrition, and extended length of stay in NICU. The objectives of this study were to determine the frequency neonatal candidemia and identify the risk factors for development of neonatal candidemia in a resource limited NICU setting.
Neonatal sepsis has nonspecific signs and symptoms making it difficult for clinicians to make an accurate diagnosis. Studies have shown that acute phase reactants such as C-reactive protein (CRP) are useful in diagnosis of neonatal sepsis and can guide duration of antibiotic therapy, thus preventing prolonged antibiotic exposure.

To determine the utility of serial CRP in determining duration of antibiotic treatment for neonates with suspected neonatal sepsis in New Born Unit at Pumwani Maternity Hospital.

A randomised controlled trial was conducted and neonates were randomly assigned by block randomisation. Patients in the control group were treated with antibiotics according to national health guidelines. Serial CRP was done for patients in the intervention group; antibiotics were stopped once two normal CRP levels 24 hours apart. Median antibiotic treatment duration was analysed using Mann Whitney U test, readmission rates one week post discharge was analysed using Fishers’ exact test.

A total of 120 patients were recruited, 60 assigned to each arm. The median duration of treatment in the intervention group was 6 days (IQR 4-7) and 4.5 days (3-7) in the control group (p=0.055). On per protocol analysis the median duration of antibiotic treatment in intervention and control were 6 days (4-8) and 5 days (3-7), respectively (p = 0.075)

There were 4 readmissions within one week of discharge in the control group with none in the intervention group (p=0.119).

There were no significant differences in the duration of antibiotic therapy in neonates with suspected sepsis managed using clinical guidelines and CRP levels.
Background and aims

Group B Streptococcus (GBS) is a common commensal bacterium that is estimated to colonize recto-vaginal areas of 15-35% of pregnant women. It is also responsible for a large proportion of neonatal morbidity and mortality. Whole genome sequencing (WGS) of GBS has identified numerous genes involved in GBS virulence, including the *Rogb* transcription factor. Of equal importance is the identification of genes associated with GBS transmission. Targeting these genes and the strains of GBS carrying them may provide an effective way to prevent GBS disease. This systematic review aims to summarize current research into specific genes and genetic changes associated with GBS transmission from mother to infant.

Methods

A systematic literature search was conducted on the MedLine database to identify papers mentioning genomic analysis in maternal and infant GBS isolates. Secondary literature search from references and grey literature was also considered. Search was conducted following PRISMA guidelines.

Results

The search criteria yielded 227 papers after abstract screening and further investigation relevant papers were selected. A number of polymorphisms and genes associated with transmission were identified from literature, including regions of the genome known to be involved in GBS virulence.

Conclusions

Specific genes and genetic changes within the GBS genome are associated with transmission of GBS between mothers and infants. A number of the genes implicated in increased transmission were also known virulence factors. There is a need for further investigation into the genes involved in GBS transmission.
Background and aims

Group B Streptococcus (GBS) is an important cause of maternal sepsis, yet limited data on epidemiology exists. We estimated the incidence of maternal GBS disease worldwide to inform policy and vaccine development.

Methods

We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data on invasive GBS disease in women pregnant or within 42 days postpartum. We undertook meta-analyses to derive pooled estimates of the incidence of maternal GBS disease and assessed maternal and perinatal outcomes and GBS serotypes.
Results

Fifteen studies and one unpublished dataset were identified, all from United Nations-defined developed regions. From the single study identified with pregnancies as the denominator, the incidence of maternal GBS disease was 0.38 (95%CI 0.28, 0.48) per 1000 pregnancies. From three studies reporting cases by the number of maternities (pregnancies resulting in live/still birth), the pooled incidence was 0.23 (95%CI 0.09, 0.37). Five studies reported serotypes, with Ia being the most common (31%), followed by III (27%), V (19%), Ib (14%) and II (5%). Most maternal GBS disease (99%) was detected at or after delivery.

Conclusions

Incidence data on maternal GBS disease in developing regions is lacking. In developed regions, maternal GBS infection was estimated to affect 1 in 4000 deliveries. Although severe sequelae for the mother were uncommon, the risk to the fetus and newborn was significant. The timing of GBS disease and serotype distribution suggests that a pentavalent maternal vaccine given in the late second or early third trimester would prevent most maternal infections.
Background and aims

Neonatal encephalopathy (NE) is a leading cause of child mortality and longer-term impairment. Infection can sensitize the newborn brain to injury, however, the role of Group B Streptococcal (GBS) disease has not been reviewed. We aim to assess the proportion of GBS disease in NE cases.

Methods

We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data from investigator groups reporting GBS-associated NE. Meta-analyses estimated the proportion of GBS disease in NE and mortality risk. UK population level data estimated the incidence of GBS-associated NE.

Results
Four published and 24 unpublished datasets were identified from 13 countries (N=10,228). The proportion of NE associated with GBS was 0.53% (95%CI, 0.13-0.93%). Mortality was significantly increased in GBS-associated NE vs. NE alone (RR 2.16, 95%CI 1.49-3.14). This equates to a UK incidence of GBS-associated NE of 0.019 per 1000 live births.

Conclusions

The consistent increased proportion of GBS disease in neonatal encephalopathy and significant increased risk of mortality provides evidence that GBS infection contributes to NE. Increased information regarding this and other organisms, is important to inform interventions, especially in low and middle resource contexts.
Background and aims

Intrapartum antibiotic chemoprophylaxis (IAP) prevents most early-onset Group B Streptococcus (GBS) disease. However, there is no description of how IAP is used around the world. We aimed to review GBS screening policies and IAP implementation worldwide.

Methods

We identified data through: (1) systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and unpublished data from professional societies and (2) an online survey and searches of policies from medical societies and professionals. We included data on whether an IAP policy was in use, and if so whether it was based on microbiological or clinical risk factors, as well as the estimated coverage (percentage of women receiving IAP where indicated).

Results
We received policy information from 95/195 (49%) countries. Of these, 60/95 (63%) had an IAP policy; 35/60 (58%) used microbiological screening, 25/60 (42%) used clinical risk factors. 2/15 (13%) low-income (LIC); 4/16 (25%) lower-middle income (LMIC), 14/20 (70%) upper middle income (UMIC) and 40/44 (91%) high income countries (HIC) had any IAP policy. The remaining 35/95 (37%) had no national policy (25/33 from LIC and LMIC). Coverage varied considerably; for microbiological screening, median coverage was 80% (range 20-95%); for clinical risk factor based screening, coverage was 29% (range 10-50%). Whilst there were differences in the microbiological screening methods employed, the individual clinical risk factors used were similar.

Conclusions

There is considerable heterogeneity in IAP screening policies and coverage worldwide. Alternative global strategies, such as maternal vaccination, are needed to enhance the scope of global prevention of GBS disease.
RISK OF EARLY-ONSET NEONATAL GROUP B STREPTOCOCCUS DISEASE WITH MATERNAL COLONIZATION WORLDWIDE: SYSTEMATIC REVIEW AND META-ANALYSES


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Background and aims

Early onset Group B Streptococcus disease (EOGBS) occurs in neonates (days 0-6) born to pregnant women who are recto-vaginally colonized with GBS, but the risk of EOGBS from vertical transmission has not been systematically reviewed. We aimed to estimate this risk and how it varies with coverage of intrapartum antibiotic prophylaxis (IAP), used to reduce the incidence of EOGBS.

Methods

We conducted systematic reviews (Pubmed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data from investigator groups on maternal GBS colonization and neonatal outcomes. We included articles with >200 GBS colonized pregnant women which reported IAP coverage. We did meta-analyses to determine pooled estimates of risk of EOGBS, and examined the association in risk of EOGBS with IAP coverage.

Results

We identified 30 articles including 20,328 GBS colonized pregnant women for inclusion. The risk of EOGBS in settings without an IAP policy was 1.1% (95% CI 0.6-1.5%). As IAP coverage increased the
risk of EOGBS decreased, with a linear association. Based on linear regression, the risk of EOGBS in settings with 80% IAP coverage was predicted to be 0.3% (95% CI 0-0.9).

Conclusions

The risk of EOGBS among GBS colonized pregnant women, from this first systematic review, is consistent with previous estimates from single studies (1-2%). Increasing IAP coverage was linearly associated with decreased risk of EOGBS disease.
STILLBIRTH WITH GROUP B STREPTOCOCCUS DISEASE WORLDWIDE: SYSTEMATIC REVIEW AND META-ANALYSES
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Background and aims
There are an estimated 2.6 million stillbirths each year, many of which are due to infections, especially in low and middle-income contexts. We aimed to estimate the percentage of stillbirths associated with GBS-disease.

Methods
We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data from investigator groups. Studies were included if they reported original data on stillbirths (predominantly ≥28 weeks’ gestation or ≥1000g, with GBS isolated from a sterile site) as a percentage of total stillbirths. We did meta-analyses to derive pooled estimates of the percentage of GBS-associated stillbirths, regionally and worldwide for recent datasets.

Results
We included fourteen studies from any period, five with recent data (after 2000). There were no data from Asia. We estimated that 1% (95%CI 0-2%) of all stillbirths in developed countries and 4% (95% CI 2-6%) in Africa were associated with GBS.

Conclusions
GBS is likely an important cause of stillbirth, especially in Africa. However, data are limited in terms of geographic spread, with no data from Asia, and cases worldwide are probably underestimated due to incomplete case ascertainment. More data, using standardized, systematic methods are critical, particularly from low and middle-income contexts where the highest burden of stillbirths occurs. These data are essential to inform interventions, such as maternal GBS vaccination.
MATERNAL COLONIZATION WITH GROUP B STREPTOCOCCUS AND SEROTYPE DISTRIBUTION WORLDWIDE: SYSTEMATIC REVIEW AND META-ANALYSES


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Background and aims

Maternal recto-vaginal colonization with Group B Streptococcus (GBS) is the most common pathway for GBS disease in mother, fetus and newborn. We aimed to determine the prevalence and serotype distribution of GBS colonizing pregnant women worldwide.

Methods

We conducted systematic literature reviews (Pubmed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS), organized Chinese language searches, and sought unpublished data from investigator groups. We applied broad inclusion criteria to maximize data inputs, particularly from low and middle income contexts, and then applied new meta-analyses to adjust for studies with less sensitive sampling and laboratory techniques. We undertook meta-analyses to derive pooled estimates of maternal GBS colonization prevalence at national and regional levels.

Results

The dataset regarding colonization included 390 articles, 85 countries, totaling 299,924 pregnant women. Our adjusted estimate for maternal GBS colonization worldwide was 18% (17-19%), with regional variation (11-35%), and lower prevalence in Southern (12.5% (10-15)) and Eastern Asia (11% (10-12)). Bacterial serotypes I to V account for 98% of identified colonizing GBS isolates worldwide.
Serotype III, associated with invasive disease, accounts for 25% (23-28), but is less frequent in some South American and Asian countries. Serotypes VI-IX are more common in Asia.

Conclusions

GBS colonizes pregnant women worldwide, but prevalence and serotype distribution vary, even after adjusting for laboratory methods. Lower GBS maternal colonization prevalence, with less serotype III may help to explain lower GBS disease incidence in regions such as Asia. High prevalence worldwide, and more serotype data, are relevant to prevention efforts.
AETIOLOGY OF NEONATAL INFECTIONS IN SOUTH ASIA: (ANISA) RESULTS FROM A CENTRE IN INDIA
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Background and aims
ANISA is a study that was conducted to determine the aetiology of newborn infections in South Asia, 2 sites each in Bangla Desh, Pakistan and India. We present the results from one of the Indian sites.

Methods
The details of the study are available in PIDJ supplement.

Results
76,121 married women were kept under surveillance over 18 months, and 6842 women delivered. The outcome of 6691 pregnancies were known; 312 were not enrolled, 6402 were enrolled. There were 66 still-births (0.98%) and 95 miscarriages. 5423 (84.7%) were asymptomatic in the first 59 days of life. 643 babies (10.1%) presented with symptoms or signs suggestive of pSBI.

643 blood cultures were done, 645 respiratory samples were collected and 55 babies underwent lumbar puncture. We enrolled 295 controls. Ethical approval was appropriately obtained and written informed consent was taken.

Out of 643 blood cultures sent, 55 were positive and 17 (2.64%) were pathogens. In addition, there were 2 babies with confirmed urinary tract infection and one with extensive soft tissue infection (2.95%). The molecular results in the blood will be presented. The details are awaiting publication.

We were able to assess the cause of deaths, if any. There were 16 pre-enrolment deaths and 64 deaths (0.99%) in the enrolled cohort, several of them in hospital. The total deaths were 80 (1.22%) in a cohort of 6530 babies.

Conclusions
The availability of causes of deaths in these babies will be useful when prioritizing resources for neonatal care.
Background and aims

Neonatal Herpes Simplex Virus (HSV) infection is a potentially fatal disease. Cutaneous infection accounts for about 45% of presentations, but diagnosis can be difficult without suggestive history of maternal infection.

Methods

We report a 10 day old male with a two day history of apparently purulent vesicles with erythema over about 20 square cm on one wrist (see photo). He was asymptomatic but flucloxacillin was commenced on the presumption of bacterial infection. The lesions, however, progressed: coalescing and spreading up the forearm while demonstrating more classical appearance of HSV (see photo). HSV 1 was confirmed by PCR on vesicular fluid, and treated with ivi Acyclovir for 14 days, to be continued orally for 6 months. CSF and blood revealed no evidence of HSV infection.

Results

Mother had no history of clinically obvious HSV but was serologically positive. She recalled a two-year old nephew had vesicular lesions around his mouth when greeting the new baby.

Conclusions

This case report shows a rare case of toddler-to-infant transmission of HSV. It is important to recognise cutaneous HSV may present in an unusual way and should be suspected in skin lesions unresponsive to antibiotics. Caution should be displayed when welcoming the newborn.
Background and aims

Nigeria accounts for nearly one-quarter of Africa's newborn deaths; a third of these deaths are attributable to infections. Though the etiology of neonatal infections in Nigeria remains poorly defined, recent studies suggest that Salmonellae are a leading cause of bacteremia in children aged less than 5 years. We report 23 cases of neonatal salmonellosis.

Methods

Neonates with fever ≥ 38°C were enrolled in a bacteremia surveillance platform in Kano, Nigeria. Blood cultures obtained were processed using the automated Bactec® incubator system.

Results

Between September 2014 through April 2017, 12 neonates, aged 6 to 30 days old, had Salmonella enterica serovar Typhi (S. Typhi) bacteremia while 11, aged 1 to 30 days old, had non-typhoidal Salmonella (NTS). When compared to neonates with NTS, bacteremia of other etiologies and those with negative blood cultures, neonates with S. Typhi had higher fevers at ≥ 39°C (P = 0.002) and higher heart rates at ≥ 160 bpm (P = 0.016) at presentation. Additionally, they were more likely to have convulsions (P = 0.001) and reduced skin turgor (P = 0.0003). Neonates with NTS were more likely to have feeding difficulty (P = 0.001) and diarrhea (P = 0.0015). There were no differences in the respiratory rate, the presence of grunting or vomiting between all the groups. So far 2 infants with S. Typhi and 3 with NTS have died.

Conclusions

Though neonatal salmonellosis is a rare event, in regions with high Salmonellae disease burden, providers should maintain a high index of suspicion to adequately manage these infections.
RELATED FACTORS OF HBV INTRAUTERINE TRANSMISSION AND THE INTERACTIONS IN NEWBORNS BORN TO HBSAG POSITIVE MOTHERS

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Background and aims

To investigate the risk factors and their interactions of HBV intrauterine transmission in newborns born to HBsAg positive mothers.

Methods

We collected 291 HBsAg positive mothers and their newborns from Hospital and investigated general demographic characteristics and delivery. FQ-PCR and CLIA were utilized to detect HBV DNA and HBV serological markers in peripheral blood of studies; ProcartaPlex was used to detect cytokines of neonates.

Results

The HBV intrauterine transmission rate was 13.05%(38/291). The multivariate Logistic regression analysis showed that positive HBeAg of mothers, natural delivery and low level of TNF-α in newborns (TNF-α<1.794pg/ml) were risk factors of intrauterine transmission, \( OR(95\% CI) \) were 2.69(1.28~5.64), 4.17(1.80~9.67) and 4.29(1.69~10.89). There was no multiplicative interaction between two of them, but positive HBeAg of mothers and natural delivery, positive HBeAg of mothers and low level of TNF-α in newborns, natural delivery and low level of TNF-α all had additive interaction, the relative excess risk due to interaction(RERI) were 5.221, 5.604, 11.859 (\( P>0.05 \); the attributable proportion(AP) were 0.461, 0.624, 0.496 (\( P<0.05 \); the synergy indexes were 2.025, 3.358, 2.074 (\( P>0.05 \)) respectively. And when the presence of both two factors, the risk of neonatal HBV intrauterine transmission increased compared to the presence alone, \( OR(95\% CI) \) were 8.06(1.53~42.47)、9.46(1.88~47.61) and 20.08(2.70~160.18).

Conclusions

Positive HBeAg of mothers, natural delivery and low level of TNF-α in newborns may increase the risk of neonatal HBV intrauterine transmission born to HBsAg positive mothers. And we suggested that HBeAg positive mothers adopt cesarean delivery in childbirth, and pay attention to the low level of TNF-α in newborns and its effect on HBV intrauterine transmission.
THE INFLUENCE OF INTRAUTERINE INFECTION ON NEONATE LINKS OF HOMEOSTASIS

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Background. One of the greatest challenges facing doctors is to decide when the diagnosis of intrauterine infection should be pursued and what correction should be appointed.

Materials and Methods. Our investigation included of 12 neonates observation (the age of 7-10 days) of both sexes, which foetal age has been determined over 38 weeks and their mothers survey. All neonates were from physiological labours. An intrauterine fetus infection was confirmed in the infant group. Nenates were observed and treated during the week (staying in hospital) Medicine (Oktagam), which have immunomodulatory effects, was added to the basic treatment.

Results All mothers(31,31±2,08 years, period of gestation -14,20±1.86 weeks ) had TORCH panel investigation( IgG Toxoplasmosis 4,28±0.86IU/ml, IgG Cytomegalovirus-1,40±0,39IU/ml, IgG Herpes simplex virus 1,19±0,41IU/ml). The level were higher than the reference values. Comparative analysis of the neonate dynamic data showed substantial difference in the majority of parameters. Levels of lymphocytes (from 21,41±2,07 to 39,18±2,71%), thrombocytes ( from 285,00±10,22 to 364,00±12,34 thousand /мкl); concentration IgG ( in 1,6 times in comparison with an initial level, from 9,27±0,74 to 14,64±039g/l, in the venous blood) were increased after using of additional treatment. The levels of erythrocytes (from 5,11±0,28 to 4,75±029 millions/mm3 ), leucocytes(16,8±0,39 to 13,10±9,67 mm3), Hematocrit ( from 59,32±2,79 to 52,36±4,07%) and concentration IgM(0,39±0,04 to 0,19±0,01g/l in venous blood had tendency to decrease.

Conclusions. Intrauterine infection had influence on infants’ inflammatory responds. Neutrophils ability violation and changes of IgG, IgM concentrations were found and were corrected by using of optimization treatment with immunomodulatory effects medicine including.
THE ROLE OF CELL PYROPTOSIS IN NEONATAL NECROTIZING ENTEROCOLITIS
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Objective

Necrotizing enterocolitis (NEC) remains a major cause for deaths in neonates, especially in preterm babies and the pathogenesis of NEC still remains unknown. This study's aim to explore the role and potential possible mechanism of cell pyroptosis in neonatal necrotizing enterocolitis.

Methods

50 1-day-old Sprague-Dawley rats were randomly divided into 2 groups, control group and NEC group (n=25). The neonatal rats in control group were left with their mothers, and not submitted to stress and all the pups in NEC group were stressed with gavage feeding, hypoxia and cold stress to induce the model of NEC. The weights of pups were measured in 3 consecutive days at the same time. All rats were killed on the fourth day via decapitation and 2 cm sections of the proximal intestines of ileocecal junction were harvested for histopathologic evaluation. The mRNA expression of NLRP3, IL-1β, IL-18 were tested by Quantitative real-time PCR. The expression and activation level of caspase-1 were detected by Western blotting. The levels of IL-1β and IL-18 in intestine tissues were evaluated by ELISA.

Results

Compared with the control group, the weight was decreased and the intestinal injury was obviously aggravated in the NEC group. The NEC group exhibited higher gene expression of NLRP3, IL-1β and IL-18(P<0.05) and higher expression of IL-1β, IL-18 proteins in intestine tissues compared with control group. Moreover, the activated caspase-1 protein only expressed in NEC group.

Conclusion

Cell pyroptosis is involved in the pathogenesis of necrotizing enterocolitis, and the mechanism may be related with the role of IL-1β and IL-18.
THE SCREENING RESEARCH FOR BIOMARKERS IN NEONATES WITH EARLY ONSET SEPSIS.

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Background and aims

Early onset sepsis (EOS) remains a major cause of mortality and morbidity in neonates, and traditional clinical markers effective for adults are less effective in these patients. This study aimed to assess the value of individual plasma biomarkers as well as biomarker combinations for predicting EOS in neonates.

Methods

This prospective study included 151 neonates with suspected EOS. Plasma levels of interleukin (IL)-27, IL-6, IL-8, tumor necrosis factor (TNF)-α, heat shock protein (HSP) 70, macrophage inflammatory protein (MIP)-1α, MIP-1β, granzyme B, and matrix metalloproteinase (MMP)-8 were measured through multiplex cytokine profiling and assessed along with C-reactive protein (CRP) and procalcitonin (PCT). Receiver operating characteristic (ROC) curve analysis was performed to evaluate the predictive ability of biomarkers individually and in combination. Logistic regression model was constructed to identify independent predictors of EOS.

Results

The proven sepsis and probable sepsis groups were combined to form the infected group (n=68), and the possible sepsis and low-risk sepsis groups were combined to form the uninfected group (n=83). The ROC area under the curve was 0.747 for IL-27(p<0.01). In addition, IL-6, TNF-α, HSP 70, MMP-8, PCT, and CRP were significantly predictive of EOS, whereas IL-8, granzyme B, MIP-1α, and MIP-1β were not. Both IL-27 and PCT were identified as independent predictors of EOS in the multivariate model, and the combined use of these markers showed significantly increased predictive ability for EOS.

Conclusions

Our results indicate that elevated IL-27 strongly correlates with EOS and may provide additional diagnostic value along with PCT.
INFECTION OF PRETERM INFANTS IN CHINESE TERTIARY NICUS: A MULTI-CENTER PROSPECTIVE COHORT STUDY

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Background and aims

To analyse incidence, mortality, pathogen distribution and site variations of hospital acquired infections (HAIs) among preterm infants in major Chinese NICUs

Methods

A prospective cohort study was conducted in 25 NICUs from 19 provinces across China from May 2015 to April 2016. All infants with gestational age <34 weeks were enrolled and followed until death or discharge. Data were collected by trained data abstractors using standardized definitions. HAIs were defined as infections occurred 48 hours after admission, including culture-proven sepsis, clinical sepsis, ventilator-associated pneumonia (VAP) and urinary tract infection (UTI).

Results

A total of 8065 infants were enrolled, with the median gestational age of 31.8 weeks and mean birth weight of 1635g (±414g). The overall incidence of HAIs was 16.6%. Thirty percent of very low birth weight and 44.5% of extremely low birth weight infants had at least one episode of HAIs during hospitalisation. The overall case fatality rate of HAIs was 8.0%, and 13.2% of infants with culture-proven sepsis died. Clinical sepsis (61%) and culture-proven sepsis (22%) accounted for majority of HAIs. Gram-negative bacilli were the predominant pathogen, responsible for 49.2% cases of sepsis. Fungi accounted for 20.1% cases of sepsis. There was a significant variation of risk of HAI among participating NICUs. A high proportion of preterm infants received antibiotics (88.7%), with mean antibiotic use of 488 days/1000 NICU days.

Conclusions

There was high incidence of HAIs with high mortality in Chinese NICU. Significant variation of HAI incidences existed among NICUs. Efforts are urgently needed to reduce HAI incidence and variations.
3 CASES OF SEPSIS AND MENINGITIS CAUSED BY SALMONELLA DUBLIN IN NEWBORNS IN CHINA
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Background and aims
Salmonella Dublin (S. Dublin) is a relatively high proportion of human infections are associated with invasive disease. It is not common in neonatal infectious disease. In order to investigate the epidemiology of Salmonella Dublin of newborn in China, this study was carried out.

Methods
Review the information of culture proven cases in China. Search “Salmonella Dublin” as the key word through Wan fang, CNKI and PubMed. And one case admitted to our hospital was present. Summarize the characteristics.

Results
3 newborns were included; gender was all female, onset age was 13-23 days, common clinical manifestation was fever, followed by poor feeding, convulsion and diarrhea. All the 3 cases got positive blood and cerebrospinal fluid (CSF) culture result. Details were showed in table 1. A 13-day newborn was diagnosed as sepsis and bacterial meningitis caused by S. Dublin in our hospital, complicated with subdural effusion and cerebral infarction. Of the 3 cases, only one had diarrhea, no confirm contact history was found from the other two. One of them died, which got Waterhouse-Friderichsen Syndrome; one gave up; and the presented case survived after long antibiotic and related therapeutic strategies.

Conclusions
Salmonella Dublin is a lethal pathogen to neonatal infectious disease, its clinical sign resembles as other sepsis and meningitis. Timely treatment should be given as soon as possible. The infectious path was undefined.
POPULATION BASED SURVEILLANCE 1997-2016 INDICATES A VARIED PATTERN OF HSV CNS INFECTION IN YOUNG INFANTS

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Background and aims

Neonatal herpes simplex virus (HSV) infection can present with central nervous system (CNS) infection in isolation or with a highly lethal disseminated infection. We sought to prospectively describe HSV CNS infection in young infants in Australia to better define HSV brain disease in this age group.

Methods

We performed prospective de-identified surveillance for HSV in infants < 60 days of life through the APSU (1997-2016). Clinician notification Secular trends were analysed for laboratory confirmed HSV CNS infection (i.e. HSV detected in the CSF by PCR, culture or elevated CSF HSV IgG, and/or abnormal brain imaging, and/or CNS symptoms. Infants with HSV CNS infection alone were compared with CNS infection with disseminated disease.

Results

During 20 years of surveillance (to Oct 2016), 79/188 (42%) infants with HSV had CNS infection [reported rate to 2014: 1.42/100,000 live births (95% CI 1.11 – 1.78)]. These infants had significantly lower BW and gestational age vs Australian birth record data, and infants infected with other types of HSV. Infants with CNS-infection alone (74%) showed significantly higher CSF WCC, older age at diagnosis (mean 14.8 versus 6.1 days), and lower mortality (2/50 vs 12/29) vs CNS with disseminated disease. Neuroimaging abnormalities (CNS: 25/40; disseminated: 12/19), and sequelae in survivors (CNS: 25/40; disseminated 3/9) were common in both groups.

Conclusions

Young infants with disseminated HSV disease have lower CNS inflammatory responses and higher mortality than those with encephalitis alone. Sequelae are common. Immunodulation to improve outcomes after HSV CNS infection warrants further evaluation.
Background and aims

Survivors of infant Group B Streptococcal (GBS) disease are at risk of neurodevelopmental impairment (NDI), a burden not previously systematically quantified. Here we aimed to estimate NDI in survivors of infant GBS disease.

Methods

We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data on the risk of NDI after invasive GBS disease in infants <90 days of age. We did meta-analyses to derive pooled estimates of the percentage of infants with NDI following GBS meningitis.

Results

We identified 6127 studies, of which 18 met eligibility criteria, all from middle or high income contexts. All 18 studies followed up survivors of GBS meningitis; only five of these studies also followed up survivors of GBS sepsis and were too few to pool in a meta-analysis. Of meningitis survivors, 32% (95% CI: 25-38%) had NDI at 18 months follow-up, including 18% (95% CI: 13-22%) with moderate to severe NDI.

Conclusions
GBS meningitis is an important risk factor for moderate to severe NDI, affecting around one in five survivors. However, data are limited, and we were unable to estimate NDI after GBS sepsis. Comparability of studies is difficult due to methodological differences including variability in timing of clinical reviews and assessment tools. Follow up of clinical cases and standardization of methods are essential to fully quantify the total burden of NDI associated with GBS disease, and inform program priorities.
THE CLINICAL ANALYSIS OF 16 NEONATES INFECTED WITH INFLUENZA VIRUS

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To investigate the clinical features, laboratory diagnostics, treatments, and prognosis of neonates infected with influenza

The clinical data of 16 neonates admitted to the neonatal ward from January 2015 to May 2017, and diagnosed with influenza by positive influenza antigen rapid detection (gold labelling immunoassay), were retrospectively analysed.

Of the 16 neonates, 11 were male and 5 female. 75.00% (12/16) of them were reported exposed to family members with cold like symptoms before hospitalization. Clinical manifestations included nasal obstruction (11/16), fever (10/16), cough (10/16), and rhinorrhea (8/16). Influenza antigen rapid detection was positive in all cases. (A positive in 10 neonates, B in 4, and both A and B in 2). Influenza immunofluorescence assays were performed in 15 cases, only 6.67% (1/15) was positive. Sputum culture was performed in 13 cases, 8 of which were positive. Staphylococcus aureus, Haemophilus influenzae, Staphylococcus haemolyticus and Moraxella catarrhalis were variously isolated. 75.00% (12/16) neonates were diagnosed with pneumonia. Only 12.5% (2/16) neonates were treated with neuraminidase inhibitor, oseltamivir. All cases were treated with antibiotics. All 16 neonates recovered well.

Neonates contacted with family members displaying cold like symptoms should be examined for influenza. Clinical manifestations include catarrhal symptoms, fever, and cough. The sensitivity of the influenza immunofluorescence assay is low as compared with the gold labelling immunoassay. Commonly encountered complications may include bacterial co-infection. Pneumonia may often develop. Appropriate antibiotics should be prescribed. The prognosis of neonatal influenza is good if treated. The clinical significance of neuraminidase inhibitors requires further investigation.
DISTRIBUTION OF PATHOGENS CAUSING NEONATAL INFECTIONS IN HOSPITALIZED NEONATES IN NICU IN DONGGUAN
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Objective: This study aimed to describe the distribution of pathogens causing neonatal infections in hospitalized neonates in NICU in Dongguan.

Methods: Data were collected from March, 2011 to February, 2017 for culture-positive specimens. Distribution of pathogens, changes of pathogens in different years and composition of pathogens in different ages of neonates were analyzed.

Results: (1) Overall, 11650 specimens were examined from March, 2011 to February, 2017, and 765(6.6%) were positive cultured. The positive rate of blood culture, sputum culture and gastric juice culture was 4% (388/9624), 21.1% (70/330), and 18.1% (307/1696), respectively. (2) Of the 765 strains of pathogens, 428(55.9%) were gram positive, including 175(22.9%) strains of Staphylococcus epidermidis, 55(7.2%) strains of Staphylococcus haemolyticus, 41(5.3%) strains of Staphylococcus hominis and 38(5.0%) strains of Staphylococcus aureus. The detection rate of methicillin resistance accounted for 28.1%(215/765). 277(36.2%) strains were gram negative, including 91(11.9%) strains of Escherichia coli, 51(6.7%) strains of Klebsiella pneumonia and 23(3.0%) strains of Bauman Acinetobacter. The detection rate of ESBLs accounted for 5.5%(42/765). 60(7.8%) strains were fungus, composed mostly by nearly smooth Candida(3.4%). (3) The top three pathogens were methicillin resistant Staphylococcus epidermidis (13.1%), Escherichia coli (11.3%) and Staphylococcus epidermidis (7.9%) from 2011 to 2014, methicillin resistant Staphylococcus epidermidis (14.4%), Staphylococcus epidermidis(9.8%) and Escherichia coli (7.1%) from 2015 to 2017. (4) The top three pathogens were methicillin resistant Staphylococcus epidermidis (12.7%), Escherichia coli (10.6%) and Staphylococcus epidermidis (9.2%) in early neonates and methicillin resistant Staphylococcus epidermidis (17.9%), epidermal Staphylococcus (8.3%) and Klebsiella pneumoniae (8.3%) in late neonates.

Conclusion: The main pathogens of neonatal infection in local area included Staphylococcus epidermidis, Escherichia coli, Staphylococcus haemolyticus, and Klebsiella Lei Bojun. The detection rate of Methicillin resistant and ESBLs was lower than that of other reports. The bacterial spectrum changed little in different years. Methicillin resistant Staphylococcus epidermidis was most common in neonatal infection. In addition, Escherichia coli and Klebsiella pneumonia were the second most common pathogen in early neonatal and late neonatal, respectively.
THE ETIOLOGICAL INVESTIGATION OF NEONATAL INFECTION RELATED TO PREMATURE RUPTURE OF MEMBRANES

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Background and aims

This study was to investigate the common pathogenic bacteria in neonatal infections with premature rupture of membrane (PROM) and to develop a working protocol for the prevention and treatment of neonatal infection after the occurrence of PROM.

Methods

16356 neonates were assigned to this study. The related clinical and laboratorial information were recorded, which including with or without PROM and time of duration, results of blood culture, CRP, chest X-ray findings and other clinical data.

Results

①A total of 3432 patients accompanied with PROM among 16356 infants, and the incidence rate of PROM was 12.4% in term neonates and 30.5% in premature infants. The incidence of infectious disease was 35.4% in infants with PROM. The positive rate of blood culture was 7.6% in infants with PROM, and it was 10.5% in term infants and 6.3% in premature infants ($\chi^2=18.370, P=0.000$). ②The common pathogenic organisms were respectively G+ cocci (58.5%) and G–bacilli (33.8%) ($\chi^2=31.695, P=0.000$). The most common organisms included Staphylococcus epidermidis, Staphylococcus hominis, Klebsiella pneumoniae, Escherichia coli and hemolytic staphylococci, they account for more than 75% of the total blood culture positive patients. Fungal infection accounted for 7.7% of the total infectious diseases and all of babies were premature infants. ③The blood culture-positive rate in PROM group time of duration <24h, ≥24h and ≥72h were 7.7%, 7.2%, and 9.6% ($\chi^2=2.701, P=0.259$), respectively.

Conclusions

The most common pathogen in PROM infants is Staphylococcus epidermidis. Staphylococcus hominis, Klebsiella pneumoniae, Escherichia coli and hemolytic staphylococci. Besides, Fungi is also a common pathogens in premature infants. There were no statistical significant of blood culture-positive rate among the PROM time of duration. However, the blood culture-positive rate has not increased with the extension of time of PROM.
EFFECTS OF PRENATAL TAURINE ON IL-6,IL-8,TNF-Α AND IL-1Β IN FETAL RAT BRAINS OF INTRAUTERINE GROWTH RESTRICTION AND THE CLINICAL SIGNIFICANCE

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Background and aims

To examine the IL-6,IL-8,TNF-α and IL-1β in rat brains and to determine the effects of antenatal taurine in the brains of fetal rats with fetal growth restriction (FGR).

Methods

we have established FGR model by feeding prenatal rats with low-protein diet. Pregnant rats were randomly divided into 3 groups: control group,FGR group,taurine group(300mg/kg-d) (n=10).The levels of serum IL-6,IL-8,TNF-α and IL-1β in 60 rat brains were determined by Enzyme linked immunosorbent assay.

Results

The level of IL-6 in brains:control group (81.070±5.286)pmol/l,test group (148.362±18.733)pmol/l,taurine group (107.361±11.184)pmol/l,there were significant differences among the three groups (H=43.760,P=0.00);the level of IL-8 in brains:control group (90.573±7.344) pmol/l,test group (165.596±8.635)pmol/l,taurine group (126.309±11.008) pmol/l,there were significant differences among the three groups (H=45.910,P=0.00); the level of TNF-α in brains:control group (8.231±0.607)pmol/l,test group (14.881±0.703) pmol/l,taurine group (11.709±0.936) pmol/l,there were significant differences among the three groups (H=45.929,P=0.00);the level of IL-1β in brains:control group (46.693±4.122) pmol/l,test group (84.799±4.315) pmol/l,taurine group (62.407±4.631) pmol/l,there were significant differences among the three groups (H=46.064,P=0.00).

Conclusions

IL-6、IL-8、TNF-α and IL-1β expressions in FGR group was significantly higher than that in control group (P<0.01). Compared with the FGR group, IL-6,IL-8,TNF-α and IL-1β in taurine group decreased significantly (P<0.01). Taurine could decrease IL-6,IL-8,TNF-α and IL-1β in fetal rat brains of IUGR.prenatal supplemet of taurine may reduce local over-expression inflammation in response in fetal rat brains,thus providing neuroprotective effects.
NEONATE FECAL MICROBIAL PROFILE CHANGES ARE RELATED WITH ROTAVIRUS INFECTION
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Background and aims

The present study was designed to investigate if rotavirus infection associates with gut microbial profile changes in newborns.

Methods

Stool samples were collected from 15 newborn babies, including 5 healthy newborns (group A), 5 asymptomatic newborns with rotavirus positive (group B) and 5 with diarrhea and rotavirus positive (group C). DNA was extracted and the V3–V4 hypervariable region of the bacterial 16S ribosomal RNA (16S rRNA) gene was amplified, sequenced and analyzed.

Results

On average, 36,285 high-quality sequences per sample were generated. B group tended to host more diverse bacterial communities than other two groups. A total of 7 phyla, 13 classes, 19 orders, 33 families, 76 genera were detected ultimately. Three predominant phyla (Firmicutes, Proteobacteria and Actinobacteria) were highly variable among three groups (R = 0.34 , P = 0.002). Of 32 genera with a mean relative abundance of >0.1%, 2 showed significant differences in relative abundance among three groups. More than 40% of the total operational taxonomical units were detected only in one group. The variation in the microbial community composition was due mainly to lactobacillales, clostridiales, enterobacteriales and bifidobacteriales in order level. The statistical analyses showed a significantly decreased richness of enterococcus and increased richness of streptococcaceae in group C. Escherichia-shigella and Bifidobacterium gradually reduced along with rotavirus infection, richness changes was significant in diarrheal neonate.

Conclusions

This study suggested obvious changes of microbial diversity and composition was closely associated with rotavirus infection in newborns. A significant richness of streptococcaceae was found in newborn with rotavirus infection.
TEMPERATURE VARIATION AS A MANIFESTATION AND ITS ROLE IN DIAGNOSIS OF EARLY ONSET SEPSIS IN PRETERMS

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Background and aims

The study was done to understand the prevalence, role of temperature variation symptoms like hyperthermia, hypothermia and temperature instability in preterm neonates within first four days of life.

Methods

Retrospective cohort study was conducted in tertiary hospital neonatal intensive care unit. All babies who presented in out patient department (within three days of life) and other corresponding inborn babies were included in the study from June 2016 to May 2017.

Results

Total number babies who presented to out patient department was 612. Of these babies 253 babies either had probable sepsis (66(26%)), screen positive sepsis (156(61.6%)) or culture positive sepsis (31(12.2%)). 123 (48%) babies presented with Fever symptoms: 110 (39.5%) babies presented had hypothermia, while 20(8%)temperature instability, of 253 neonates with temperature symptoms, 42(16.5%) had pneumonia 14(5.5%) had meningitis, 9 babies had both.

Conclusions

Out of all the babies admitted to NICU ,48 % of the babies presented with hyperthermia or hypothermia or temperature instability during first three days of life. three fourths of them had clinical ,screen positive or culture positive sepsis .Temperature symptoms were rarely observed in EOS-negative newborns (8%) but despite low sensitivity, were highly specific for bacterial infection in preterm newborns.

The background universal understanding that the preterm neonates present with hypothermia predominantly when in sepsis is not sacrosanct.
PRESEPSIN AS A DIAGNOSTIC MARKER OF NEONATAL SEPSIS IN PRETERM INAFANTS

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Background and aims

Presepsin has recently been described as biomarker of sepsis. The study was conducted to compare presepsin and C-Reactive protein in detection of Sepsis.

Methods

The study was conducted in neonatal intensive care unit of a tertiary care hospital. The study included 86 preterm babies. They were divided into two groups of 42 (septic) and 44 (controll) in number, enrolled in sequential manner from Feb 2017 to May 2017. The septic group was defined as either blood culture positive or clinically suspected sepsis. Controll group was defined as those babies who are not having any antenatal risk factors for sepsis and are clinically stable. Chemiluminescent enzyme immunoassay (CLEIA) method was used to measure the plasma levels of presepsin.

Results

Plasma levels of presepsin was significantly higher in sepsis group as compared to non septic group. (P < 0.01).

The area under curve of ROC between two groups was 0.87 for presepsin as compared to CRP. The plasma value of presepsin of 674pg/ml was associated with sensitivity of 89.5%, specificity of 79%, positive predictive value of 92% and negative predictive value of 77% in detecting sepsis.

Conclusions

Presepsin is a sensitive and relatively accurate biomarker to detect sepsis in preterm babies.
INFANT GROUP B STREPTOCOCCAL DISEASE INCIDENCE AND SEROTYPES WORLDWIDE: SYSTEMATIC REVIEW AND META-ANALYSES

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Background: Group B Streptococcus (GBS) remains a leading cause of invasive neonatal disease in high-income contexts. Recent evidence suggests higher incidence of GBS disease in Africa, where intrapartum prophylaxis is rarely implemented. We investigated the incidence of infant invasive GBS disease and the associated serotypes causing disease, updating a previous review.

Methods: We conducted systematic literature reviews (PubMed/MEDLINE, EMBASE, LILACS, WHOLIS and SCOPUS) and sought unpublished data from investigator groups regarding invasive...
GBS disease in infants aged 0-89 days worldwide. Eligible studies were those that described incidence, deaths, or serotypes. We conducted random-effects meta-analyses of incidence, case fatality risk (CFR) and serotype prevalence.

**Results:** We identified 135 studies with data on incidence (n=90), CFR (n=64) or serotype (n=45). The pooled incidence of infant GBS invasive disease was 0.49/1000 live births (95%CI 0.43-0.56), being highest in Africa (1.12, 95%CI 0.43-1.80) and lowest in Asia (0.30, 95%CI 0.22-0.38). Early-onset disease (EOGBS, onset <7 days of life) incidence was 0.41/1000 (0.36-0.47), and late-onset disease (LOGBS, 7-89 days) 0.26/1000 (0.21-0.30). Case fatality risk was 8.4% (6.6-10.2%) overall and higher in EOGBS (10.0%, 95%CI 7.0-12.0%) than LOGBS (7.0%, 95%CI 4.0-9.0%). Serotype III (61.5%) was most frequently identified, with 97% of cases caused by five serotypes (Ia/lb/II/II/V).

**Conclusions:** The incidence of infant GBS disease remains high in some regions, particularly Africa. We likely underestimated incidence particularly in low-income contexts, due to incomplete case ascertainment resulting from reduced access to care, incomplete sampling, and insensitive laboratory methods. The low incidence in Asia requires further investigation.

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The incidence of infant GBS disease remains high in some regions, particularly Africa. We likely underestimated incidence particularly in low-income contexts, due to incomplete case ascertainment resulting from reduced access to care, incomplete sampling, and insensitive laboratory methods. The low incidence in Asia requires further investigation.
COMPARISON OF RISK FACTORS FOR METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) COLONIZATION IN HEALTHY NEWBORNS, BORN TO MOTHERS WITH AND WITHOUT MRSA COLONIZATION

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Background and aims

Background: Methicillin-resistant Staphylococcus aureus (MRSA) is a nosocomial pathogen of NICUs, often, preceded by colonization. Corresponding to the increasing prevalence in the community, the carriage of MRSA in pregnant women has also been increased and vaginal MRSA carriage predisposes newborns to colonization during the birth process.

Objective: To compare the risk factors for the MRSA colonization in healthy newborn, born to mothers with and without MRSA colonization

Methods

This case control study was conducted in the Division of Paediatric Infectious Diseases, Department of Paediatrics, King Edward Medical University/Mayo Hospital, Lahore from January to June 2016 (ongoing). The maternal and neonatal risk factors for MRSA were recorded. The mothers were subjected to vaginal swab and anterior nares swab for MRSA within 6 hours prior to plan delivery. The nasal swab for culture from anterior nares of newborn was obtained within 1 hour of birth. Samples were cultured in Paediatric Microbiology laboratory. Data were analyzed and compared. Each newborn with positive MRSA was treated with mupirocin.

Results

Out of total, 60 mothers and their newborns, 14 had MRSA colonization. The maternal risk factors included prolong rupture of membranes >18 hrs, cephalic presentation, and maternal anemia. The neonatal risk factors included cesarean delivery and presence of meconium.

Conclusions

MRSA colonization was detected in 23% of infants. Prolong rupture of membranes >18 hrs and cephalic presentation were most common risk factors for MRSA colonization.

Key words: Risk factors, Methicillin Resistant Staphylococcus aureus, MRSA, colonization, newborn
PREDICTORS OF PNEUMOCOCCAL NASOPHARYNGEAL CARRIAGE IN 5-8 WEEK OLD HEALTHY INFANTS IN FIJI

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Background and aims

Of all the cases of pneumococcal meningitis in children <5 years old, about 40% of cases occur in infants <6 months old. Early acquisition of pneumococcal carriage, a prerequisite for disease, is common in resource-poor settings. This study describes the risk factors of pneumococcal nasopharyngeal (NP) carriage in very young Fijian infants and explores the association between vaginal delivery and early carriage.

Methods

Purposive quota sampling was used to undertake four annual cross-sectional carriage surveys in 5-8 weeks old Fijian infants in 2012-2015. Potential risk factors were collected by questionnaire. NP swabs were collected and processed using standard methods.

Results

There were 2006 infants in the study. Infants born by vaginal delivery were at greater risk of being colonised compared with infants born by caesarean delivery (aOR 1.48; 95%CI 1.04-2.11; p=0.029). This risk was similar to living with two or more children under 5 (aOR 1.54; 95%CI 1.23-1.94; p<0.001). Other independent risk factors for carriage included: being indigenous Fijian (aOR 3.45; 95%CI 2.68-4.43; p<0.001), having symptoms of upper respiratory tract infection (aOR 1.41; 95%CI 1.05-1.90; p=0.024), and living below the poverty line (aOR 1.31; 95%CI 1.05-1.65; p=0.017).

Conclusions

Early pneumococcal acquisition is associated with vaginal delivery. Although causality cannot be ascribed, vertical transmission, the effect of mode of delivery on the infant microbiome, and maternal antibiotic administration during a caesarean section, may all play a role in early carriage. Ethnicity is the strongest predictor of early carriage.
MATERNAL RECTO-VAGINAL ESBL COLONIZATION AT THE TIME OF DELIVERY IS ASSOCIATED WITH ADVERSE NEONATAL OUTCOMES IN GWAGWALADA, FEDERAL CAPITAL TERRITORY, NIGERIA

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Background and aims

The leading cause of neonatal deaths in Nigeria are infections. A 2013 pilot study from Nigeria found that extended-spectrum beta-lactamase-producing Enterobacteriaceae (ESBL-E) accounted for 50% of neonatal sepsis. The aim of this study was to assess the prevalence of maternal recto-vaginal ESBL-E colonization and determine the subsequent impact on neonatal morbidity and mortality.

Methods

A prospective, cross-sectional study was conducted at the University of Abuja Teaching Hospital from April, 2016 through May, 2017. Maternal-neonatal pairs enrolled in the study were screened for ESBL-E colonization with maternal recto-vaginal cultures obtained at time of delivery and infant ear-throat cultures within the first 15 minutes of life. A neonatal 28-day case follow-up was performed to assess for the impact of ESBL-E vertical transmission on infant morbidity and mortality.

Results

In total, 124 of 1028 (12.1%) mothers were colonized by ESBL-E at delivery. At the time of this reporting, 51 of 876 (5.8%) of infant cultures processed are ESBL-E colonized; with 31.5% with an associated positive maternal culture and 2.5% with a negative maternal culture. 28-day infant
Conclusions

The prevalence of ESBL-E colonization among pregnant women was high in this region, with a trend towards increased neonatal morbidity and mortality, especially in those neonates with confirmed vertical transmission.

K.N. acknowledges support from the Thrasher Research Fund.
EARLY RECOGNITION OF NEONATAL HAEMOPHILUS INFLUENZA SEPSIS

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Background and aims

Since the advent of Haemophilus influenza type b (Hib) conjugate vaccines, the incidence of Hib infection has decreased.

Unfortunately the Hib vaccine does not confer any protection against nontypeable strains of Haemophilus influenza (NTHi) and perinatal infection remains a common problem.

In the absence of distinctive clinical features, diagnosis rely on isolating NTHi from a sterile site.

We report two neonatal cases with similarity in antenatal risk factors.

Methods

Case 1

39 weeks gestation, mother had hind water leak for two weeks, GBS was negative on swabs. A 3.55kg baby was delivered by Caesarean section for a fetal distress

His initial CRP was 7, but rose to 105 by 18 hours. Blood culture isolated a gram negative bacilli within 24 hours. LP was negative for meningitis. At 48 hours his blood culture confirmed H Influenza sensitive to Cefotaxime and Amoxicillin. He received 10 days of treatment and discharged home with follow up.

Results

Case 2

A 27 week baby weighing 1.086kg was delivered spontaneously following a prolonged antenatal period of decreasing liquor volume.

Initial CRP of 18 had risen to 28 and 73 by 36 hours. He grew H influenza on day 1 from blood culture. He sustained an IVH making CSF cell count difficult to interpret. He responded to a 14 day course of IV Cefotaxime and had a long neonatal stay in view of prematurity.

Conclusions

We call for better antenatal screening, as an early diagnosis would guide clinicians in making appropriate antimicrobial choices, project duration of treatment and counsel the families regarding prognosis.
AN ANALYSIS OF DEATH CASES FROM REGIONAL CRITICAL PATIENTS TRANSFER SYSTEM

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Background and aims

To investigate the causes, characteristic information and risk factors of death cases from regional critical patients transfer system.

Methods

The clinical records of 17 death cases and 21 survival asphyxia cases from transfer system in the four years from 2013 to 2017 were collected and statistically analyzed.

Results

The first transferring reason was asphyxia. (13/74.47%). The main causes of death was withholding treatment because of asphyxia (9/52.94%), congenital disease (5/29.41%) and economic difficulty of preterm (1/5.88%). The death cases of asphyxia had lower Apgar Scores in 5 and 10 minutes after birth, lower pH value, worse coagulation, higher shock rate, longer waiting for transferring and needed more intensive resuscitation.

Conclusions

Asphyxia and its complications were the main causes of neonatal death. The severe asphyxia infants need appropriate correction of acidosis, supplement of fluid for circulation and serum to improve coagulation after adequate resuscitation. The resuscitation skills for asphyxia should be trained periodically. It will be safer for patients that the transfer team arrive before the risky delivery. Respiratory distress in the first hour after delivery of infants without asphyxia also cannot be ignored. Managements of hyperglycaemia and hypertension during the pregnancy need more critical interventions. Fetals with decrease of amniotic fluid may have risk of asphyxia and congenital disease. Extreme preterm need more social support especially in financial and nursing aspects.
Efficacy of Heated Humidified High Flow Nasal Cannula for the Treatment of Newborn with Type I Respiratory Failure

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Background and aims

To study the clinical efficacy of Heated Humidified High Flow Nasal Cannula (HHHFNC) for the treatment of newborn with type I respiratory failure.

Methods

82 neonates with type I respiratory failure between October 2014 and May 2016 were randomly assigned to HHHFNC (n=40) and Nasal continuous positive airway pressure (nCPAP) (n=42). Arterial blood gas analysis performed at 1, 24h after ventilation and following parameters were compared between two groups: baseline characteristics, length of stay, feeding intolerance, intubation, incidence of complications such as pneumothorax, brain injury (Intraventricular hemorrhage-Periventricular leukomalacia, IVH-PVL), bronchopulmonary dysplasia (BPD), retinopathy of prematurity (ROP) and skin pressure ulcer.

Results

The rate of skin pressure ulcer, PaCO₂ after 1h ventilation and feeding intolerance were significantly lower in HHHFNC group (P<0.05). There were no significant differences in following parameter: PaO₂ after ventilation, the incidence of length of stay, brain injury, BPD, ROP (P>0.05). In the subgroup of serious neonatal respiratory distress syndrome, patients received HHHFNC had higher rate of extubation failure; however, there was no significant differences between the whole groups (P>0.05). The rate of pneumothorax was higher in nCPAP group when compared in term baby.

Conclusions

HHHFNC maybe a substitution of nCPAP for the treatment of newborn with type I respiratory failure induced by different sorts of neonatal disease, because of its similar oxygenation and better efficacy of protection from hypercapnia, pneumothorax, skin pressure ulcer and feeding intolerance.
FEASIBILITY OF SECRETIONS DERIVED FROM HUMAN ADIPOSE-MESENCHYMAL STEM CELLS FOR INFANTS WITH MODERATE/SEVERE HYPOXIC-ISCHEMIC ENCEPHALOPATHY

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Background and aims

To assess feasibility and safety of hAMSC to neonates with hypoxic-ischemic encephalopathy

Methods

An open-label, multi-center clinical trial at 6 NICUs. Neonates diagnosed with moderate/severe HIE were randomly assigned to intrathecal injections of secretions derived from hAMSC at 12, 24, 48 hours after birth. We recorded characteristics, vital signs, neural manifestations and adverse events. MRI, CU, EEG, and neurobehavioral tests were undertaken before the enrollments and reexamined at 6, 12, and 18 months of age. Mortality and NBNA at discharge were recorded as hospital outcomes. At 18 months after birth, survivals’ Bayley Scales (China Version), Peabody Development Measure Scales were compared, and Gross Motor Function Measure Scale for Cerebral Palsy children as statistical analysis

Results

98 patients were enrolled to the trial and all received routine therapies, while 44 infants were assigned to experimental group. Clinical characteristics, death rate, vital signs were similar between groups. Fewer infants in experimental group had abnormal NBNA scores at 28 days after birth. 8 patients in experimental group and 2 patients in controlled group still need to be followed up at 18 month. The long-term outcome of survived patients: at 18 months, 27 of 38 (90%) secretions recipients and 27 of 43 (65.9%) conventional therapy only recipients got scores of Total Motor Quotient≥85.

Conclusions

Secretions derived from hAMSC were associated with a reduced risk of brain injury of newborn with HIE. Adverse effects of secretions of hMSCs were minimal. More data for long term outcomes are being collected and analyzed.
Objective  Breast milk is the major route of postnatal cytomegalovirus (CMV) transmission, especially in premature infants. To investigate whether the premature infants can continue fresh breast milk feeding, when their mothers are CMV infected.

Methods  Thirty-seven infected premature infants and seventy-six control premature infants were followed up retrospectively for six months. The incidence, clinical characteristics, symptoms and long-term outcome of six months were analyzed.

Results  Postnatal CMV infection was diagnosed in 32.7% (37/113) of premature infants who were fed fresh breast milk. In 48.6% (18/37) of cases, CMV infection was symptomatic. The numbers of infants with thrombocytopenia, increased liver enzymes, hepatosplenomegaly and Neonatal necrotizing enterocolitis (NEC) were significantly higher in infected group than in control group (P < 0.05). Growth status, neurodevelopmental outcome and hearing loss at six months were not different between the study groups.

Conclusions  Premature infants have a high risk of acquiring CMV infection via breast milk and consequently developing symptoms. The benefits of breastfeeding outweigh the risk of acquiring CMV infection. Considering the advantages and benefits of breast milk for preterm infants, fresh breast milk is still the first choice.
THE DESTRUCTIVE EFFECT OF ZIKA BY THE FETUS

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Introduction: Zika is a disease caused by a virus of the genus Flavivirus of the family Flavoviridae (ZIKV). Its transmission may be: vector-dependent caused by different mosquitoes or vector-independent, by sexual and perinatal transmission. In 2016, WHO confirms the association between Guillan Barre Syndrome and microcephaly with the Zika declaring a public health emergency at the international level that remains in force. The objective of our work is to describe the known mechanisms by which the Zika virus produces abnormalities of the fetal nervous system.

Methodology: For the search of articles, we used Pubmed database, entering the words "MeSH Term", "Zika and microcephaly"; we obtained 610 results, so we decided to use "MeSH Subheadings": "pregnancy and fetus", discarding 580 Articles preserving 30. Through the rapid reading of the abstracts we discarded 9, including 21 articles.

Results and conclusions: It has been found that if the infection occurs during the first trimester of pregnancy there are more abnormalities in the fetal nervous system than in the other quarters. We will describe the different theories tested in vitro and in vivo, which explain the tropism of ZIKV by this tissue. We begin by explaining the mechanism of viral entry to cerebral cortical progenitor cells, joining a surface molecule called Axl (belonging to the family of TAM receptors) expressed in blood vessels, cortical organs and radial glia of the fetal cerebral cortex. Once inside the cell, transcription of the mRNA modifies and deregulates the expression of genes that regulate cell death, increasing the production of caspase 3 and 7, favoring apoptosis. In addition it increases the expression and activation of TLR3 producing an increase in inflammation affecting 41 genes involved in fetal nervous system development, axonal direction, apoptosis and cell differentiation. In conclusion, at present, at least 41 genes are known to be modified by the Zika infection in the fetal nervous system, modifying their normal development.
EFFECT OF NEONATAL PBMC HBV CCCDNA ON NON-/HYPO-RESPONSE TO HEPATITIS B VACCINE OF INFANTS BORN TO HBSAG-POSITIVE MOTHERS

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Background and aims

The rate of non-/hypo-response to hepatitis B vaccine of infants born to HBsAg-positive mothers is high. To explore the effect of neonatal PBMC HBV cccDNA on non-/hypo-response to hepatitis B vaccine of infants and the underlying immunology mechanism.

Methods

A total of 233 HBsAg-positive pregant women and their newborns were enrolled in this study. The women and their newborns were recruited from the Third People's Hospital of Taiyuan. All infants received hepatitis B vaccine with the “0, 1, 6” month schedule. HBV cccDNA levels of neonatal peripheral blood mononuclear cells (PBMC) were determined by real-time PCR-TaqMan probe method. Neonatal and infantile HBV-M, dendritic cells and Th1/Th2 cytokines in serum were measured using electro-chemiluminescence immuno-assay (ECLIA) kits, flow cytometric (FCM) and fluorescence quantitative polymerase chain reaction (FQ-PCR) assay, respectively.

Results

The rate of non-/hypo-response was 16.37%. In neonatal HBeAg negative group, neonatal PBMC HBVcccDNA positive may be the protective factor to the hepatitis B vaccine non-/hypo-responderesponse in infant (OR=0.429, 95%CI:0.279~0.657). In Hepatitis B vaccine non-/hypo-response group, the level of neonatal CD8+ T cells and IL-12 level is high (t=2.019, P<0.05) ; (z=2.565, P<0.05). Neonatal PBMC HBVcccDNA level was negatively correlated with neonatal CD8+ T cells and IL-12 levels (r=-0.426, P<0.05), (r=-0.457, P<0.05). The infant anti-HBs levels was negatively related to newborn CD8+ T cells (r=-0.274, P<0.05).

Conclusions

Neonatal PBMC HBVcccDNA may be related to non-/hypo-response to hepatitis B vaccine of infants born to HBsAg-positive mothers, and the relationship between them may be related to its secretion of CD8+ T cells and IL-12 content.
NEONATAL INFECTIONS

RELATED FACTORS OF HBV INTRAUTERINE TRANSMISSION AND THE INTERACTIONS IN NEWBORNS BORN TO HBSAG POSITIVE MOTHERS

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Background and aims

Maternal transmission is the important reason for chronic HBV carriers in China, and HBV intrauterine transmission is one of the important reason and its mechanism is unknown. So we investigate the risk factors and their interactions of HBV intrauterine transmission in newborns born to HBsAg positive mothers.

Methods

We collected 291 HBsAg positive mothers and their newborns from hospital and investigated general demographic characteristics and delivery. FQ-PCR and CLIA was utilized to detect HBV DNA and HBV serological markers in peripheral blood of mothers and neonates; ProcartaPlex were used to detect cytokines of neonates.

Results

The HBV intrauterine transmission rate was 13.05%(38/291). The multivariate Logistic regression analysis showed that positive HBeAg of mothers, natural delivery and low level of TNF-α in newborns (TNF-α<1.794pg/ml) were risk factors of intrauterine transmission, OR(95%CI) were 2.69(1.28~5.64)、4.17(1.80~9.67) and 4.29(1.69~10.89). There was no multiplicative interaction between two of them, but positive HBeAg and natural delivery, positive HBeAg and low level of TNF-α, natural delivery and low level of TNF-α all had additive interaction, the relative excess risk due to interaction(RERI) were 5.221, 5.604, 11.859 (P>0.05), the attributable proportion(AP) were 0.461, 0.624, 0.496 (P<0.05), the synergy indexes were 2.025, 3.358, 2.074 (P>0.05) respectively. And when the presence of both two factors, the risk of neonatal HBV intrauterine transmission increased compared to the presence alone, OR(95%CI) were 8.06(1.53~42.47)、9.46(1.88~47.61) and 20.08(2.70~160.18).

Conclusions

To decrease the risk of HBV intrauterine transmission, HBeAg positive mothers should adopt cesarean delivery in childbirth, and pay attention to the low level of TNF-α in newborns and its effect on HBV intrauterine transmission.
EXPRESSON OF NF-κB IN PLACENTA OF HBsAg POSITIVE MOTHERS ON NON/LOW-RESPONSIVENESS OF THEIR INFANTS TO HEPATITIS B VACCINE

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Background and aims

To investigate the expression of NF-κB in placenta of HBsAg positive mothers on non/low-responsiveness of their infants to hepatitis B vaccine.

Methods

Collect 99 pairs of HBsAg positive mothers and their infants, investigate the expression of NF-κB in placenta of HBsAg positive mother on non/low-responsiveness of their infants to hepatitis B vaccine.

Results

It was found that the mothers’ HBV DNA loads more than or equal to 10^7 copies/ml, the infants with hepatitis B vaccination non/low response risk was 3.790 times than HBV DNA negative of group mothers (OR=3.790, 95%CI: 1.006~14.273). the TNF-α was more than or equal to 2.43 pg/ml of infants with hepatitis B vaccine immune non/low response risk were 0.297 time less than 2.43 pg/ml infants (OR=0.297, 95%CI:0.113~0.784). At the same time, the IL-12 of newborn serum and NF-κB expression of placenta was negatively correlated (r =-0.259, P=0.021), IL-12 of newborn serum in was negatively correlated with newborn TNF-α(r =-0.457, P<0.0001), the TNF-α of newborn serum and TNF-α of infant serum was postitively correlated (r =0.322, P=0.005).

Conclusions

Infants born to HBsAg positive mother were more easier to become non/low-responsiveness when maternal HBV DNA loads were more than 10^7 copies/ml and TNF-α≥2.43 pg/ml of infants. The expression of NF-κB in placenta of HBsAg positive mothers on non/low-responsiveness of their infants to hepatitis B vaccine maybe be related to IL-12 of newborns.
NEONATAL CHICKENPOX, ANALYSIS OF 22 CASES

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Background and aims

To analyze the clinical characteristics, treatments and prognosis of neonatal varicella.

Methods

The clinical data of 22 neonates with chickenpox in 4 hospital from April 2013 to April 2017, including the manifestation, diagnosis, treatments and outcomes, were reviewed respectively.

Results

A total of 22 neonatal chickenpox patients, 15 boys and 7 girls (2.14/1), were diagnosed, their ages ranged from 0-28 days. The median age was 13 days. 19 patients were spread from their mothers, two patients were infected by their sisters. Nine mothers appeared prenatal herpes and eight had the rash after delivery (two unknown). The average incubation period of prenatal period infection in neonates was 11 days, and the average incubation period of postpartum infection of neonatal varicella was 8.125 days. Clinical manifestations including typical herpes with different levels of jaundice (22 cases, 100%), fever (11 cases, 50%) and cutaneous secondary bacterial infection (3 cases, 13.6%), no body suffered from pneumonia, encephalitis or other important organ disease. 14 cases received acyclovir drip treatment, 4 cases were treated with acyclovir + immunoglobulin, 2 cases were immunoglobulin treatment, 1 case was treated without any drug, 1 case received one dose of dexamethasone, different groups of treatments had no significant effects on eruption time, average hospitalization time was 5.6 days, dexamethasone treatment group hospital day prolonged to 15 days for secondary skin bacterial infection.

Conclusions

Newborn chickenpox was almost infected from the mother, with no serious manifestations. This disease was self-limited with good prognosis.
WHOLE GENOME SEQUENCING OF GROUP B STREPTOCOCCUS COLONISED MOTHERS AND INFANTS UNCOVERS GENETIC ASSOCIATIONS WITH BACTERIAL PERSISTENCE AND COLONISATION

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Background and aims

Group B Streptococcus (GBS, also known as *Streptococcus agalactiae*) is a leading cause of neonatal meningitis and sepsis worldwide. GBS disease manifests as pneumonia, sepsis or meningitis as early-onset or late-onset in neonates under the age of 3 months and virtually disappears thereafter. Whilst more is known on the transmission dynamics in early-onset disease, routes of transmission and colonisation dynamics in late-onset disease are yet to be elucidated. Understanding transmission and pathogen genetics for GBS could inform targeted intervention strategies such as decolonisation of colonised mothers and newborns to reduce the risk of infant infection; and provide more information on common targets among all GBS to inform future vaccine for maternal vaccination.

Methods

We have carried out whole genome sequencing of 250 GBS isolates from colonised Gambian mother-infant pairs to uncover the genetic adaptations for vertical transmission, postnatal acquisition, markers associated with colonisation and persistence.

Results

We have identified Serotype V as the most prevalent serotype in our Gambian cohort, a serotype strongly associated with persistent colonisation.

Conclusions

Genomic studies as our one will provide more information on specific virulence factors and other genomic regions that could be associated with transmission and colonisation and will provide more information on potential new targets for vaccines.
LATE-ONSET SEPSIS OF EXTREMELY LOW BIRTH WEIGHT INFANT: CLINICAL CHARACTERISTICS, PATHOGEN DISTRIBUTION AND ANTIMICROBIAL SUSCEPTIBILITY

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Background and aims

To evaluate the clinical characteristics, pathogen distribution and antimicrobial susceptibility of extremely low birth weight infant (ELBW) with late-onset sepsis

Methods

Clinical characteristics, results of blood culture and drug susceptibility test for ELBW with late-onset sepsis in the department of neonatology at hospital from January 2008 to June 2014 were retrospectively analyzed.

Results

Main manifestations included feeding intolerance, respiratory apnea, reaction difference, unplained jaundice, et al. And most common complication was pulmonary hemorrhage and heart failure. Thirty-five strains were detected in the blood samples, with Gram-positive bacteria accounting for 37.5% and Gram-negative bacteria accounting for 34.38%, fungus for 28.13%. Coagulase-negative Staphylococci, Klebsiella and Candida albicans were the three most common pathogens. Gram-positive cocci was strongly resistant to penicillin G, erythromycin, but still sensitive to vancomycin and linezolid. The resistance rate of Gram-negative bacilli to ampicillin was 100.00%, and the resistance rate to cepofepime, selectrin and cefazolin was 60.0%-100.00%, but low to carbapenem.

Conclusions

The clinical presentations of ELBW with late-onset sepsis are various and non-specific. Gram-positive organisms accounted for the highest proportion, Coagulase-negative Staphylococci was the most common pathogens. The selection of sensitive antibiotics based on pathogens and drug resistance testing for the treatment of late-onset sepsis of extremely low birth weight infant can reduce the generation of drug-resistant strains and increase the therapeutic effects.
Background and aims

With the progress of perinatal medicine and neonatal technology, more and more extremely low birth weight (ELBW) infants survived all over the world. Very few data have been reported to show the risk factors of nosocomial infections among ELBW infants in the developing countries such as China.

Methods

Data were collected retrospectively from 247 infants consecutively hospitalized over 48 hours in three intensive care unit from June 2008 to June 2014.

Results

82 infants developed 103 episodes infections during 11523 patient days. Nosocomial infections rate was 33.20%. Pneumonia were the most common (59/103, 57.28%), 26 cases were ventilator-associated pneumonia, account for 44.07% of pneumonia. Ventilator-associated pneumonia rate was 2.49/1000 ventilator days. 117 pathogens were identified, gram-negative organisms accounted for the highest proportion (72/117, 61.54%), Klebsiella pneumoniae was the most common pathogens (20/72, 27.78%), 90% (18/20) with positive extended-spectrum β-lactamase. Single factor analysis revealed that birth weight, gestational age, mechanical ventilation, peripherally inserted central catheters, broad-spectrum antibiotic therapy, indwelling time of catheters, duration of mechanical ventilation, and length of hospitalization were risk factors. Multivariate logistic regression analysis showed birth weight (OR=0.008, 95%CI:0.000～0.132), mechanical ventilation (OR= 3.699, 95%CI:1.105～12.379), and length of hospital stay (OR=1.043, 95%CI:1.013～1.073) were independent risk factors of nosocomial infections.

Conclusions

Extremely low birth weight infants are greatest risk of nosocomial infections. Decrease invasive operations and shorten length of hospital stay could be conducive to minimise the nosocomial infections.
EVALUATION OF RISK FACTORS OF NEONATAL OR INTRAUTERINE INFECTION FOLLOWING PREMATURE RUPTURE OF MEMBRANES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims

The objective of the present study is to determine the accuracy of indicators in the prediction of intrauterine or neonatal infection using a systematic review and meta analysis.

Methods

English databases Ovid Medline, EMbase, and Cochrane library, as well as Chinese databases Chinese Biomedical Literature Database (CBM), China National Knowledge Infrastructure (CNKI) and VIP Database for Chinese Technical Periodicals (VIP) were searched from the beginning of the database up to September 2016. NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE was used to assess the quality of included studies. We calculated odds ratio (OR) for dichotomous data and weighted mean difference (WMD) for continuous data, with respective 95% confidence intervals (CI). We used mean and standard deviation to describe quantitative variables and rate to describe qualitative variables.

Results

From the 18 studies analyzed, there were 15 potential risk factors of neonatal or intrauterine infection following PROM. AFI, maternal IL-6, maternal age, maternal positive culture, and time span from membrane rupture to delivery and birth weight were found to be increased risk factors for neonatal or intrauterine infection following PROM, while maternal neutrophile granulocyte, serum IL-8, and IL-2R were less valuable in the prediction of neonatal infection.

Conclusions

AFI, maternal IL-6, maternal age, maternal positive culture, and time span from membrane rupture to delivery and birth weight were found to increase the risk of neonatal or intrauterine infection following PROM. These parameters could be considered in the detection of neonatal or intrauterine infection and help the rational use of prophylactic antibiotics in newborns following PROM.
INVESTIGATION ON THE MECHANISMS OF THE PROTECTIVE EFFECTS OF ACTIVATED PROTEIN C ON INTRAUTERINE INFLAMMATION-INDUCED NEONATAL WHITE MATTER INJURY

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Background and aims

To explore the potential mechanisms of the protective effects of activated protein C (APC) on intrauterine inflammation-induced white matter injury in rats.

Methods

An intraperitoneal injection of 350 µg/kg lipopolysaccharide (LPS) was consecutively administered to the pregnant Sprague-Dawley rats on embryonic day 17 and 18 (LPS group). The LPS+APC group was administered with an intraperitoneal injection of 0.2 mg/kg APC 30 min after the second LPS injection. The distribution of fibrinogen-like protein 2 (fgl2) and the accompanied fibrin deposition in the placenta and fetal brain were evaluated. The mRNA and protein expression levels of proinflammatory cytokines (TNF-α, IL-1β, and IL-6) were detected by RT-PCR and ELISA. The activation of microglia and the expression of protease activated receptor 1 (PAR-1) and nuclear factor-kappa B (NF-κB) p65 were evaluated by double immunofluorescence staining and Western-Blot.

Results

APC markedly reduced the LPS-induced increase in fgl2 expression and fibrin deposition, as well as the mRNA and protein expression of the pro-inflammatory cytokines TNF-α, IL-6, and IL-1β, in the placentas and fetal brains. The number of activated microglia and the microglial expression of PAR-1 in the fetal brains of the LPS+APC group were significantly lower than the LPS group. A significant elevation in the protein expression levels of NF-κB p65 was noted after the LPS injection, and was downregulated following the treatment with APC.

Conclusions

This study provides new therapeutic and preventative strategy for neonatal brain injury and suggests that APC maybe a potential theoretical approach for intrauterine inflammation-induced white matter injury.
Background and aims

To analyze clinical data of rotavirus infection of the newborn and realize the characteristics of rotavirus infection of the newborn, to prevent hospital infections diffusion of newborn nursery.

Methods

Analyze retrospectively 102 were divided into newborn group and infant group. We contrasted their temperatures and having fever days and vomiting times and diarrhea times and base excess (BE) in blood gas analysis. Then, we would analyze the newborn who were in hospital because of “septicaemia?” and the newborn who were diagnosed bacteria infection severely at the corresponding time period, in order to contrast their white bell count (WBC) and C reactive protein (CRP).

Results

The newborn’s vomiting and diarrhea times were fewer than the infants, and the BE descending were not obvious. Comparison of the two groups has statistical significant. Comparison of the newborn who were in hospital because of “septicaemia?” and the newborn who were diagnosed bacteria infection severely at the corresponding time period: At the initial stage of the disease, the comparison of the WBC and CRP has not statistical significant, but, after 24 hours, the newborn who were diagnosed bacteria infection severely had higher WBC and CRP, the comparison has statistical significant, especially, the difference of CRP are notable.

Conclusions

The difference of the newborns who have rotavirus infection and the newborns who were diagnosed bacteria infection severely is that WBC and CRP do not raise up progressively after 24 hours of disease of rotavirus infection.
SEROPREVALENCE OF MATERNAL AND CORD ANTIBODIES SPECIFIC FOR DIPHTHERIA, TETANUS, MEASLES, MUMPS AND RUBELLA IN BEIJING, CHINA

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Background and aims

Maternal antibodies contribute to the protection of young infants from infectious diseases during the first months of life. However, vaccination of pregnant women or non-pregnant women of child-bearing age is not recommended in China. The aim of this was study to investigate the level of protective immunity against vaccine preventable diseases in pregnant women and newborns in China.

Methods

One hundred and ninety-four paired maternal and cord blood samples were collected in Beijing in 2016. Antibodies specific for diphtheria-tetanus-pertussis (DTP) and measles-mumps-rubella (MMR) vaccination were determined by ELISA.

Results

The 75% percentiles for concentrations of anti-diphtheria, anti-tetanus, anti-pertussis toxin, anti-pertactin, anti-measles, anti-mumps and anti-rubella in maternal/cord sera were 0.25/0.23 (IU/ml), 0.15/0.12 (IU/ml), 5.58/5.15 (IU/ml), 18.79/20.29 (IU/ml), 681.72/747.10 (IU/l), 56.08/58.44 (RU/ml) and 43.58/40.36 (IU/ml), respectively. A total of 55.7% (95% CI: 48.6%-62.5%)/61.3% (95% CI: 54.3%-67.9%), 71.1% (95% CI: 66.4%-77.1%)/73.2% (95% CI: 66.6%-78.9%), 96.4% (95% CI: 92.7%-98.2%)/97.4% (95% CI: 94.1%-98.9%), 29.9% (95% CI: 23.9%-36.7%)/30.4% (95% CI: 24.4%-37.2%), 67.0% (95% CI: 60.1%-73.2%)/65.5% (95% CI: 58.5%-71.8%) and 15.5% (95% CI: 11.1%-21.2%)/17.0% (95% CI: 12.4%-22.9%) of mothers and newborns had no protection against diphtheria, tetanus, pertussis, measles, mumps and rubella, respectively. Only 2.6% (95% CI: 1.1%-5.9%)/1.0% (95% CI: 0.3%-3.7%) and 21.6% (95% CI: 16.4%-28.0%)/23.7% (95% CI: 18.3%-30.2%) of mothers and newborns had protection against all three components of DTP and MMR.

Conclusions

These data supported the immunization program for women at child-bearing age against for DTP and MMR vaccines.
Background and aims
To report a rare case of newborn of purulent meningitis with cerebral hemorrhage in frontal lobe and left thalamus.

Methods
In this case report, we describe the case of an 9-day-old boy with high fever and signs of seizure in whom cerebrospinal fluid analysis indicated purulent meningitis caused by Escherichia coli. The first computed tomography on his admission to hospital demonstrated subdural hematoma and 7 days later computed tomography showed right frontal lobe hemorrhage and left thalamus hemorrhage.

Results
On analysis, the cerebrospinal fluid was yellow colored and muddy, there was neutrophilic pleocytosis, increased protein, and decreased glucose levels present. No tuberculosis or other bacteria were detected. There was a high level of CRP, PCT and Bilirubin at his admission. The patient received intravenous antibiotherapy with meropenem. The status of the patient improved intravenous antibiotic therapy.

The patient's brain computed tomography image showed ICH in the right frontal lobe, and left thalamus hemorrhage.

Conclusions
Purulent meningitis (PM) usually caused by a variety of pyogenic infection, is a kind of central nervous system infectious disease mostly common in children. It is easily misdiagnosed and its symptoms are varied. This observation illustrates an unusual presentation of PM and the early identification of the bacteria, combined with the correct treatment, prevent the complications and even death.
COMPARATIVE WHOLE-GENOME ANALYSIS BETWEEN PREGNANT WOMEN-COLONIZING AND NEONATE-INFECTING GROUP B STREPTOCOCCUS ISOLATES
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Background and aims

Group B Streptococcus (GBS) is a frequent resident of the vaginal tract in pregnant women and a major cause of invasive infection in neonates. GBS is readily transmitted from mother to neonate; however, molecular mechanisms for the transmission and invasion from mothers to their neonates remain unknown.

Methods

In this study, four mother-neonate pairs of GBS isolates recovered from vaginal colonization mothers and bloodstream-infected neonates and another four GBS isolates recovered from vaginal colonization mothers without invasive infection in neonates were collected for whole-genome sequencing by using the Illumina and PacBio next-generation sequencing technologies.

Results

The genome sequences between the mothers and neonates in the four pairs were virtually identical. We further compared the genomes between the high- and low-virulence vaginal isolates recovered from mothers with and without subsequent neonate infections. Two closely related phylogenetic groups were revealed, one group including the three high-virulence isolates and the other group consisting of one high-virulence and three low-virulence isolates. Between the high- and low-virulence isolates, we identified 88 and 49 genes that are either gained or lost, mediated mostly by integration or deletion of phage DNA.

Conclusions

Five GBS genomes have been fully assembled and we are in the process of identifying and validating candidate virulence-associated genes using bioinformatics and experimental approaches.
PREVALENCE AND MOLECULAR EPIDEMIOLOGY OF CARBAPENEM-RESISTANT KLEBSIELLA PNEUMONIAE IN NEONATES

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Background and aims

To investigate the characteristics of fifty-eight non-duplicate carbapenem-resistant Klebsiella pneumoniae (CRKP) as a cause of neonatal infection.

Methods

Antimicrobial susceptibility testing was conducted by micro-broth dilution methods. β-lactamases were characterized by polymerase chain reaction (PCR) and DNA sequencing, and plasmids were analyzed by S1-PFGE and transformation experiment. Pulsed-field gel electrophoresis (PFGE) and multi-locus sequence typing (MLST) were used to determine the genotypes and homology of these isolates. The outer membrane proteins were examined by SDS-PAGE.

Results

The detection rate of carbapenem-resistant K. pneumoniae isolates in the NICU was about 42.7% (58/136) and the blaNDM-1 was positive in 89.7% (52/58) of the CRKP strains. The others 5 and 1 isolates produced blaOXA-232 and blaimp-36, respectively. All of blaNDM-1-positive isolates belonged to 12 PFGE types, of which 50% were designated as ST278 and 25% as ST2735 by MLST, respectively. All 58 K. pneumoniae strains were resistant to ertapenem and cephalosporin antibiotics tested in present study. In addition, 8.6%, 20.7%, 20.7%, 96.6% and 96.6% of these strains were resistant to amikacin, gentamicin, ciprofloxacin, imipenem and meropenem, respectively. The plasmids bearing blaNDM-1 could be transferred into the recipient strain E. coli DH5α through transformation experiment in all strains except the isolates designated as ST2735. The S1-PFGE results showed that the plasmids carrying the blaNDM-1 gene were approximately 50 kb in size.

Conclusions

Our study indicates a polyclonal spread of blaNDM-1-positive K. pneumoniae isolates among different patients in the NICU of our hospital, and in which the ST278, ST2735 and ST15 are main three clone types.
Background and aims

We aimed to describe colonization of postnatal gut microbiota in preterms and the dynamic changes during infection and Necrotizing enterocolitis (NEC) in a Chinese NICU.

Methods

Preterms who were hospitalized in children’s hospital of Fudan University from February 2014 to February 2015 were enrolled. Fecal samples were collected weekly, beginning with the meconium, until preterm discharge or 12-weeks-postnatal age. Illumina high-throughput sequencing was used to sequence all microbial genomes in fecal samples.

Results

*Actinobacteria, Bacteriodetes, Firmicutes* and *Proteobacteria* were predominant in all samples, and 29 families were in higher relative abundance (≥1%). Along with the increase of postnatal age, the microbial abundance and diversity were gradually increased. The general proportion of pathogenic bacteria (*Enterobacteriaceae, Enterococccaceae* and *Staphylcocccaceae*) was gradually declined, while the proportion of anaerobic bacteria (*Bifidobacteriaceae, Clostridiaceae, Lactobacillaceae* and *Veillonellaceae*) was rised. When neonate suffered with infection and/or NEC, the gut microbial abundance was decreased. The general proportion of pathogenic bacteria was always very high before and during the course of infection and NEC, while the proportions of anaerobic bacteria were declined further. In infants who had antibiotics use more than 7 days, the microbial abundance and diversity in Day 14 of age were significantly declined.

Conclusions

In preterms, the gut microbial abundance and diversity were rised with the postnatal age. Prolonged use of antibiotics at early postnatal age might decrease microbial abundance and diversity, and affect microbial colonization.
PREMATURITY DUE TO CONGENITAL BRUCELLOSIS

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Background and aims

Brucellosis is a zoonotic infectious allergic disease caused by the Brucella, has been reported in association with bone marrow transplantation, blood transmission, transplacental or perinatal exposure, ingestion of unpasteurized milk or other dairy products form infected animals or through close contact with their secretions.

Methods

Human-to-Human transmission, which is rare, congenital brucellosis, which is an extremely rare condition, the case report a premature baby born at 34+2 weeks gestation suffering from brucella melitensis biovars 1,

Results

the baby was born had severe respiratory distress, Enlargement of liver and spleen, fever, Thrombocytopenia.

Conclusions

The blood cultures of the baby and the mother and the father were positive for Brucella melitensis, supporting the diagnosis of brucellosis with presumed intrauterine infection.
ANALYSIS OF THE EPIDEMIOLOGICAL CHARACTERISTICS OF NEONATAL BACTERIAL MENINGITIS

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Background and aims

To study the epidemiological characteristics of neonatal bacterial meningititis.

Methods

To collect clinical data of children with neonatal bacterial meningititis in our hospital on July 1, 2012 to June 30, 2017. Analysis accounts for the proportion of the hospitalized children, seasonal distribution and the changes of etiology, etc. in this five years.

Results

1. 5 years the hospital treated 1245 cases of neonatal bacterial meningititis, male 758, female 487 cases. 2. 1 July each year solstice on June 30, the following year for one year, five years, neonatal bacterial meningititis there is an upward trend in the number of cases, accounted for the proportion of children with the same period in hospital respectively at 209/6025, 227/6132, 245/6251, 269/6375, 295/6746. 3. The number of cases in the four seasons of spring, summer, autumn and winter was 318, 421, 283, 223 respectively, accounting for 25.54%, 33.82%, 22.73% and 17.91% respectively. The incidence rate was the highest in summer, and the lowest in winter. The difference was statistically significant. 4. cerebrospinal fluid culture positive for 496 cases (39.84%), the pathogen of e. coli 236 cases (236/496, 47.58%), 54 B lactose streptococcus, staphylococcus 89 cases, the other 72 cases with intestinal, 45 cases of other bacteria. 5. The proportion of E. coli is on the rise in this 5 years. It was 40.51%, 42.62%, 45.63%, 50.25%, 56.65%.

Conclusions

in recent years, the incidence of neonatal bacterial meningitis is on the rise, with the highest incidence in summer. E.coli is the main pathogenic bacteria.
EFFICACY AND SIDE EFFECTS OF GANCICLOVIR IN THE TREATMENT OF NEONATAL CMV INFECTION

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Background and aims

To investigate the clinical efficacy and side effects of ganciclovir in the treatment of neonatal cytomegalovirus infection.

Methods

Sixty-four cases of congenital cytomegalovirus infection were randomly divided into treatment group (32 cases) and control group (32 cases), the control group using conventional symptomatic treatment, the treatment group is based on the control group combined with ganciclovir treatment, compared the two groups of children with clinical efficacy and side effects.

Results

The total effective rate of the treatment group 90.6%, 65.5% in the control group, ALT, AST and TBil in the treatment group were lower than those in the control group. Although the incidence of adverse reactions was 12.5% higher than that of the control group, the reaction disappeared and $P<0.05$ after the treatment was stopped. Adverse reactions were lost.

Conclusions

In the conventional symptomatic treatment based on further intravenous infusion of ganciclovir treatment of neonatal congenital cytomegalovirus infection, clinical efficacy is significant, although a small number of adverse reactions, but the medication stopped disappearing, so the treatment It is worth to further promote and apply in clinical practice.
THE VALUE OF IL-6 AND PCT IN DIAGNOSIS OF NEONATAL SEPSIS

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Background and aims

Neonatal sepsis is a significant health issue associated with high mortality, which symptoms are subtle and nonspecific, single laboratory indicator is difficult to clinical diagnostic. The objective of this study was to explore the clinical significance of interleukin-6 (IL-6) and procalcitonin (PCT) in the diagnosis of neonatal sepsis.

Methods

This was a prospective study conducted between August 2014 and February 2016. A total of 382 neonates were enrolled and classified into a sepsis group (n=90), a local infection group (n=171), and control group (n=121). Serum levels of IL-6 and PCT were measured before treatment and 3 days after treatment. To analyze the value of combined diagnosis in neonatal sepsis.

Results

Before treatment, serum levels of IL-6 and PCT in the sepsis group were higher than those in the local infection and control groups (P<0.05), the local infection group had higher levels of IL-6 and PCT than the control group (P<0.05). After treatment, the levels of IL-6 and PCT in the sepsis group remained higher than that in the local infection and control groups (P<0.05). Analysis of receiver operating characteristics (ROC) curve demonstrated that the sensitivity, specificity and accuracy of IL-6 (cut-off ≥27.82pg/ml) were 91.1%, 81.2% and 82.5% respectively, the sensitivity, specificity and accuracy of PCT (cut-off ≥5.04μg/L) were 74.4%, 85.3% and 82.7% respectively. When combined with IL-6 and PCT, the sensitivity, specificity and accuracy for the diagnosis of neonatal sepsis were 66.2%, 94.1% and 86.6% respectively.

Conclusions

The combined detection of serum levels IL-6 and PCT may increase the accuracy of diagnosis of neonatal sepsis.
Background and aims

To investigate the levels of IgG antibody to pertussis toxin (PT) in newborns and to analyze the susceptibility of newborn infants to pertussis in Shunyi Women and Children's Hospital of Beijing Children's Hospital in 2016.

Methods

A total of 419 newborns were enrolled in this study. Umbilical cord blood sample was collected from each subject and detected by enzyme-linked immunosorbent assay to measure the concentration of anti-PT IgG. Besides, all newborns were followed up to January 31, 2017. Chi-square test was used for statistical analysis.

Results

Umbilical cord blood samples positive for anti-PT IgG accounted for 30.1% (126/419). The median antibody level was < 5 U/ml, and the 90th and the 95th percentile were 14.3 and 24.0 U/ml, respectively. No cases of pertussis occurred at the end of follow-up.

Conclusions

The newborns born in Shunyi Women and Children's Hospital of Beijing Children's Hospital are generally lack of protective anti-PT antibody and vulnerable to pertussis.
Background and aims

Objective to investigate the neonatal purulent meningitis (hereinafter referred to as the brain) method for early diagnosis and treatment.

Methods

A retrospective analysis in March 2016 to June 2017 I branch of the clinical data of 45 cases of children with neonatal purulent meningitis, summarize the experiences of early diagnosis and treatment.

Results

Atypical early performance of its new cerebral meningitis, lack of specificity of the central nervous system, early diagnosis difficult. Cure the 36 cases, accounting for 80%, 3 cases of death in children with the onset of time to see a doctor more than 48 h, including 2 cases of birth weight < 2500 g; Survivors merger of 8 cases of neurological complications, accounts for about 17.7%.

Conclusions

Its new.
NEONATAL INFECTIONS

INTESTINE KLEBSIELLA COLONIZATION PREDICTS KLEBSIELLA PNEUMONIAE SEPSIS OR PNEUMONIA IN VERY PREMATURE INFANTS

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Background and aims

This study aimed to investigate the association of intestine Klebsiella colonization and K. Pneumoniae infection in very premature infants.

Methods

This was a prospective longitudinal study of very premature infants. Stool samples of 53 very premature infants were obtained on the first day, 7th day, 14th day, 28th day and 6th month. DNA was extracted and the V3,4 hyper-variable region of 16S rRNA was amplified followed by high throughput sequencing on Miseq platform. Relative abundances of Klebsiella in intestine were compared between infants with and without K. Pneumoniae infection.

Results

Of 53 very premature infants, 13 infants developed K. Pneumoniae infection including 7 late onset sepsis and 6 pneumonia. The mean infection days were 19.75±1.56, 95%CI (16.54, 22.95) days. Compared to infants who had no K. Pneumoniae infection, the relative abundance of intestinal Klebsiella were significantly increased in infected infants on the 7th (0.47±0.14 vs 0.21±0.06, P=0.038) or 14th day (0.66 ±0.12 vs 0.37±0.07, P=0.039). Mechanical ventilation rate were higher in K. Pneumoniae infection infants than in controls (84.61% vs 37.5%, P=0.003). There were no significant difference of gestational age, birth weight, delivery mode, early onset infection, early antibiotics use, PICC time, initial feeding time, breast feeding, full feeding days and probiotic use between the two groups.

Conclusions

Our results indicated blood stream or pulmonary K. Pneumoniae infection might derive from gut over colonization of K. Pneumoniae. Monitoring gut microbial in very premature infants may help to predict late onset blood stream or pulmonary infection.
NEONATAL INFECTIONS

POSTNATAL DEVELOPMENT OF TH1, TH2, TH17 CELL IN VERY PRETERM INFANTS
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Background and aims

This study aimed to observe T helper (Th)1, Th2 and Th17 cell levels at birth in very preterm infants and their postnatal changes in the first 6 months, also investigate the influences of perinatal and clinical complications on the changes.

Methods

Th1, Th2 and Th17 cell percentages in peripheral blood on the first, 7th, 14th, 28th day and 6th month in 61 very preterm infants and in cord blood of 24 healthy full term infants were measured with flow cytometry. The association of postnatal Th1, Th2 and Th17 cell percentage level at each time point with perinatal factors and postnatal clinical factors were performed.

Results

Both term and very preterm infants had very low proportion of Th1, Th2 and Th17 cell in CD4+ T cell at birth. Th17 cell percentage on the first day in very preterm infants was significantly increased, while Th1 cell percentage and Th1/Th2 ratio were significantly reduced. Th17 cell percentage in very preterm infants was not increased until the 28th day and decreased thereafter. Th1 cell percentage level increased slowly after one week and significantly increased after 4 weeks, reached to the highest level at 6 month. Th2 cell percentage on day 14th and 28th were higher than on day 1st, but always less than 1%. Th1/Th2 ratio was around 1.0 in the first month and increased to about 2.5 at 6 month.

Conclusions

Th1/Th2 ratio at birth was significantly lower in very preterm infants than in full term infants, while could increase after born. Late onset sepsis in very preterm infants might be associated with Th17 cell activation.
NEUTROPHIL IMMUNOPHENOTYPES IN NEONATES WITH BACTERIAL SEPSIS

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Background and aims

To investigate neutrophil alterations bacterial sepsis infants. Assess potential associations between phenotypes and severity of sepsis.

Methods

Study included 42 infants with bacterial sepsis and 33 infants without infection from Children’s Hospital of Fudan University from 2015 to 2016. Critical sepsis included septic shock and severe sepsis. Subsets of neutrophils were detected by flow cytometry included subsets of early-stage neutrophils (CD16-/CD62L-PMN), immature neutrophils (CD16-/CD62L+PMN), mature neutrophils (CD16+/CD62L+PMN) and activated neutrophils (CD16+/CD62L-PMN).

Results

Proportion of PMN in preterm infants (27.2%) was lower than in term infants (37.5%). Activated neutrophils occupied high percentage in neonates without infection (61.1% in preterm and 47.6% in term). Overall level of PMN was higher in sepsis group than in control group ($P<0.05$). In preterm, proportions and absolute counts of early-stage neutrophils and immature neutrophils were higher in sepsis infants than in control infants ($P<0.001$). In term, absolute counts of immature neutrophils were higher in sepsis infants than in control infants ($P<0.05$). Early-stage neutrophils and immature neutrophils significantly increased in critical sepsis infants. Multivariate logistic regression analysis showed critical sepsis patients had higher proportion of early-stage neutrophil compared with common sepsis [OR=1.19, $P=0.01$].

Conclusions

Neonates have high level of activated neutrophils. Self-activation may exist in neonatal neutrophils. Early-stage neutrophils increased obviously especially in preterm. And high level of early-stage neutrophils has an association with severity of sepsis in early stage of sepsis. However, mechanisms of the alterations and functions of the neutrophils subsets need further study.
CHANGES AND CLINICAL SIGNIFICANCE OF LYMPHOCYTE SUBSETS IN NEWBORN WITH RESPIRATORY SYNCYTIAL VIRUS PNEUMONIA

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Background and aims

To compare the level of lymphocyte subsets in peripheral blood between the acute and recovery stage of respiratory syncytial virus pneumonia, as well as to compare the study group and the control group, in order to explore the changes of lymphocyte subsets in newborns with RSV pneumonia.

Methods

23 cases of neonates with RSV pneumonia were collected as study group, and 20 newborns with hyperbilirubinemia as the control group. They were all from neonatal centre, Beijing Children's hospital. The lymphocyte subsets (CD³⁺, CD⁴⁺, CD⁸⁺, CD⁴⁺/CD⁸⁺, B Cells, NK Cells) in peripheral blood were detected by flow cytometry. ELISA was used to detect IFN-γ, IL-4.

Results

The levels of CD⁴⁺ T cell in acute and recovery stage of RSV group were all significantly lower than that in the control group. The level of CD⁸⁺ T cell, NK cell and IFN-γ in recovery stage of RSV group was significantly lower than that in acute stage, while there was no statistical significance between the RSV group and the control group. The level of B cell in either acute or recovery stage of RSV group was all significantly higher than that in the control group. The level of NK cell and IFN-γ in acute stage of RSV group was significantly higher than the control group.
Conclusions

In acute phase of neonate with RSV pneumonia, CD$^8^+$ T cells, B cells, NK cells and Th$_1$ cytokine IFN-$\gamma$, may play a role in fighting against RSV infection. In recovery period, the level of B cells further increases, which continue to maintain the humoral immune function.
COMPARATIVE WHOLE-GENOME ANALYSIS BETWEEN PREGNANT WOMEN-COLONIZING AND NEONATE-INFECTING GROUP B STREPTOCOCCUS ISOLATES
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Background and aims

Group B Streptococcus (GBS) is a frequent resident of the vaginal tract in pregnant women and a major cause of invasive infection in neonates. GBS is readily transmitted from mother to neonate; however, molecular mechanisms for the transmission and invasion from mothers to their neonates remain unknown.

Methods

In this study, four mother-neonate pairs of GBS isolates recovered from vaginal colonization mothers and bloodstream-infected neonates and another four GBS isolates recovered from vaginal colonization mothers without invasive infection in neonates were collected for whole-genome sequencing by using the Illumina and PacBio next-generation sequencing technologies.

Results

The genome sequences between the mothers and neonates in the four pairs were virtually identical. We further compared the genomes between the high- and low-virulence vaginal isolates recovered from mothers with and without subsequent neonate infections. Two closely related phylogenetic groups were revealed, one group including the three high-virulence isolates and the other group consisting of one high-virulence and three low-virulence isolates. Between the high- and low-virulence isolates, we identified 88 and 49 genes that are either gained or lost, mediated mostly by integration or deletion of phage DNA.

Conclusions

Five GBS genomes have been fully assembled and we are in the process of identifying and validating candidate virulence-associated genes using bioinformatics and experimental approaches.
ANALYSIS OF RELATED FACTORS ON PROCALCITONIN VALUES IN NEWBORNS WITH NEONATAL HYPERBILIRUBINEMIA

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Purpose: Although procalcitonin (PCT) level is useful for the diagnosis of neonatal sepsis, with the in-depth study of PCT, PCT reliability of the diagnosis of neonatal infection there is some controversy. This study aimed to investigate PCT levels and factors influencing increased PCT level in hyperbilirubinemia of newborns without bacterial infection during four days after being born.

Methods: A total of 138 children who received neonatal hyperbilirubinemia were enrolled in our hospital between June 2015 and June 2016, PCT levels were measured on the first and fourth days at the hospital. Newborns with proven bacterial (blood culture positive for bacteria) or suspicious infection (presence of C-reactive protein expression or leukocytosis/leukopenia) were excluded. Maternal infectious status (reflected by fever, chorioamnionitis, positive placental culture, and intravenous antibiotic therapy) were excluded. The final sample size was 40, and the 40 cases of newborns were analyzed. Statistical analysis was used to determine the factors that affected the increase of PCT level in neonates with hyperbilirubinemia without infection.

Results: 40 hyperbilirubinemia of newborns had higher PCT levels (PCT≥0.5ng/ml). There were a significant correlation of PCT with age(Sig.=0.03), RCTP(Sig.=0.049), TB(Sig.=0.029) and IDB(Sig.=0.019).

Conclusion: In hyperbilirubinemia of newborns without bacterial infection, there is a significant correlation between PCT level and age, RCTP, TB and IDB during the four days of life. The clinical value of PCT in neonatal infection diagnosis need further research, should be taken into account by birth age, jaundice and other interference factors, should be under dynamic monitoring, PCT continue to rise, can more accurately reflect the presence of infection, so as to guide the rational application of antibiotics.
SUCCESSFUL TREATMENT WITH SURFACTANT IN PRETERM INFANTS WITH PULMONARY HEMORRHAGE 2 CASES REPORT
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Background and aims

Pulmonary hemorrhage (PH) is a life threatening condition in newborns, especially preterm infants. Surfactant replacement might be helpful to improve lung function and reduce the ventilation support in infants with PH.

Methods

We report two premature infants (one with early PH and one with late PH) who have been successfully rescued by administering surfactant (Calsurf) after an acute episode of bleeding.

Results

Both of the 2 infants survived and surfactant administration showed improvement in mean airway pressure and oxygenation indices. In the current study Calsurf was found effective in the treatment of both early PH and late PH in premature infants.

Conclusions

There was no potential side effects were found in our study.
VERTICAL TRANSMISSION OF CAMPYLOBACTER FETUS SUBSP. TESTUDINUM SUBSP. NOV.: A CASE REPORT
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Background and aims

Pregnant women are more susceptible to Campylobacter fetus and infection with C. fetus may lead to abortion. Whether C. fetus can vertically transmit is still unclear. Here we present a case of vertical transmission of Campylobacter fetus subsp. testudinum subsp.nov.: a new subtype of C. fetus.

Methods

Bacterial culture of amniotic fluid and the blood of the neonate were conducted, and the isolate was identified with biochemical method and cellular fatty acid analysis. 16S rRNA gene and housekeeping gene sequencing and MLST typing were conducted to demonstrate the identical of isolate from amniotic fluid and the blood of the neonate.

Results

The isolates from both amniotic fluid and the blood of the neonate were gram negative spiral bacteria and had similar biochemical profile. Cellular fatty acid analysis demonstrated that both isolate have similar fatty acid component and identical to the refereed database. Both biochemical reactions and cellular fatty acid analysis demonstrated the isolates were C. fetus. 16S rRNA gene sequences showed that both isolates were closely related to C. fetus with 100% identity, and housekeeping gene analysis got similar results. The results of MLST typing revealed that both isolates were the same genotype with a novel ST (allelic profiles: 13-8'-10-5-10-5-5), which represents a novel allelic gene sequences. Gene sequencing and MLST typing demonstrated the isolates were C. fetus subsp. testudinum subsp.nov.

Conclusions

Our case presented here demonstrated that C. fetus can vertically transmit and may lead to neonatal sepsis.
Background and aims

To analysis the general information and clinical features of premature bloodstream infections and study its implementation and problem of antibacterial agents' special intervention, which shows the effects on the pathogen and prognosis of premature bloodstream infections.

Methods

We got 93 cases, 103 cases and 289 cases confirmed diagnosed and collect their clinical data to do retrospective analysis.

Results

1. The whole situation of all admitted cases in group pre-intervention, transition and post-intervention:
   (1) The premature bloodstream infection's admitted rates in our hospital of three groups (0.66%, 1.38%, 2.13%) are gradually raised ($P<0.001$). (2) The hospital infection incidence of premature bloodstream infections of three groups (0.13%, 0.43%, 0.54%) are gradually raised ($P<0.001$). 2. The comparison of premature bloodstream infections among group pre-intervention, transition and post-intervention: (1) Clinical features: the comparison about the utilization rates of total parenteral Nutrition (74.19%, 88.35%, 86.85%), fat emulsion (70.97%, 83.00%, 85.47%), PICC (7.53%, 15.53%, 21.80%), mechanical ventilation (26.88%, 32.04%, 41.18%) and phototherapy (58.06%, 65.05%, 75.78%) shows group post-intervention is higher than pre-intervention ($P<0.05$). (2) There is no significant differences in antibacterial agent resistances of the common pathogenic bacteria and fungus among three groups ($P>0.05$).

Conclusions

With antibacterial agents’ special intervention, the average DDDs of three groups gradually lowered and the change times or the combined usage of antibacterial agents for premature bloodstream infections have been improved significantly, meanwhile, it did not increase the hospitalized days or change the outcome for premature bloodstream infections. That prompts the special intervention of antibacterial agents’ clinical application for premature bloodstream infections has feasibility and availability.
The oral microorganisms on the surface of neonatal endotracheal tubes facilitate the pathogenicity of Pseudomonas aeruginosa in vitro and in vivo

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Background and aims

Ventilator-associated pneumonia (VAP) results in considerable morbidity and mortality in neonatal intensive care units. VAP is associated with polymicrobial biofilms that form on endotracheal tubes (ETTs) especially such as Pseudomonas aeruginosa, an opportunistic pathogen that is the leading cause of iatrogenic infections in critically ill patients.

Methods

In this study, we aimed to investigate the diversity and the bacterial community in biofilms on ETTs extubated from mechanically ventilated newborns, and emphasized on the mechanisms of bacteria interaction in vitro, and in vivo using a pulmonary infection mouse model.

Results

The dominant bacterial species were Klebsiella spp., Streptococcus spp., and Pseudomonas spp. The most frequently occurring Streptococcus species was Streptococcus mitis. Streptococcus spp. often co-existed with P. aeruginosa. The addition of Streptococcus mitis or its secretion (autoinducer 2, AI-2) to P. aeruginosa increased biofilm formation, bacterial viability, and the production of virulence factors of P. aeruginosa PAO1. Consistent with the in vitro results, in vivo results revealed that the use of AI-2 significantly increased the mortality, lung bacterial count and histological lung damage of mice with acute P. aeruginosa PAO1 infection. In addition, both Streptococcus mitis and AI-2 could up-regulate the expression of quorum sensing-associated genes and genes encoding virulence factors.

Conclusions

Our results demonstrated that Klebsiella spp., Streptococcus spp., and Pseudomonas spp. were the most frequent microbes on the surface of neonatal ETTs. The co-existence of oral commensals and pathogenic bacteria on the same tubes may play a crucial role for biofilm formation.
FOUR CASES OF CANDIDEMIA CAUSED BY CANDIDA HAEMULONII: SPECIES IDENTIFICATION, ANTIFUNGAL SUSCEPTIBILITY AND OUTCOMES

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Background and aims

Candidemia cases caused by non-albicans Candida species has been increasing. We firstly reported four bloodstream infection due to Candida haemulonii which occurred within twenty days in a single neonatal intensive care unit (NICU) in China.

Methods

A total of fourteen isolates recovered from four neonates, of which ten came from the blood and four from the central venous catheters. The all clinical isolates were identified using VITEK 2, both the VITEK MS and Bruker Biotyper MALDI-TOF mass spectrometers and sequence analysis of the rRNA gene internal transcribed spacer (ITS) regions.

Results

The results of susceptibility tests showed that all isolates exhibited resistance to fluconazole, amphotericin B and 5-Fluorocytosine in vitro. The voriconazole and itraconazole MICs of all the strains were 0.5 g/ml. All cases of C. haemulonii fungemia occurred in neonatal with very low birth weight infants who had central venous catheters and broad-spectrum antibiotics.

Conclusions

Four neonates were empirically treated with fluconazole antifungal treatment. Two cases were cured by 3 months of fluconazole treatment. another two cases recovered well by two months after changing the antifungal agent to voriconazole.
Background and aims

The clinical manifestations and drug resistance of neonatal infections defeated Elizabethkingia meningoseptica (EM) were discussed in this paper. It may provide evidence for clinical treatment and prevention of neonatal EM infection.

Methods

Two cases of neonatal EM infection during 2016 and 2017 identified by the VITEK 2 system of BioMerieux and to analyze in vitro drug susceptibility were Retrospective analysed.

Results

All the two cases of EM infection were from the neonatal intensive care unit (NICU), 1 case of strains was isolated from both blood and cerebrospinal fluid at the same time, the other one was isolated from respiratory tract specimens. The in-vitro drug sensitivity test showed that that EM was resistant to ceftriaxone, cefepime, Carbapenem, piperacillin-tazobactam and Aminoglycosides. Both of the two neonates were premature infants suffered from RDS, and treated with mechanical ventilation and surfactant. both of the two cases had ventilator associated pneumonia and neurodevelopment disability. One of them survived with hydrocephalus, and the other had alleviative treatment because of severe pneumonia and severe periventricular leukomalacia and the baby finally died.

Conclusions

EM has higher resistance to commonly used clinical antibiotics example of cephalosporins and penicillium, even of Carbapenem. Neonatal infectioned with EM can cause serious complications such as severe lung disease and neurodevelopment disability. So that its especially important to prevent the nosocomial infection of EM. Premature infants, and mechanical ventilation may be the risk factors of EM infection.
Background and aims

Nosocomial infections have become a matter of major concern and an important cause of morbidity and mortality in neonatal intensive care units. Objective: The objective of this study was to determine the incidence, anatomical sites and causative organisms of Nosocomial infections in 28-34GA preterm in a ShenZhen NICU, and to assess the impact of Nosocomial infections on length of stay.

Methods

This was a retrospective study carried out for ten years in the NICU of the ShenZhen hospital form 2006-2016. Nosocomial infections rates were calculated using overall nosocomial infection rate, nosocomial infection incidence density, device-specific infection rates and device-days infection rates.

Results

Of the 625 neonates evaluated, 45 developed 47 nosocomial infective episodes, equating to an incidence rate of 7.52% or 6.1 infections per 1000 bed-days. Pneumonia was the most frequently occurring infection (25.4%) followed by bloodstream infection (17.6%) and Catheter-Related Blood Stream Infection (CRBSI) 1.48%(2/135), The most frequently isolated organisms were Klebsiella spp.(29.8%) followed by Escherichia coli (17.5%) and Methicillin-resistant Staphylococcus aureus (14.0%). fungal infection is 5.26%.Nosocomial infections were associated with prolonged hospital stay.

Conclusions

Nosocomial infections is a significant problem in NICU of the Luohu Hospital of Shenzhen. Gram-negative bacteria, especially Klebsiella spp.were the predominant causes of neonatal Nosocomial infections, as has been described in other studies from developing countries.
MATERNAL-NEONATAL LISTERIOSIS: A CASE SERIES AND REVIEW OF 140 CASES
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Background and aims

Neonatal and fetal Listeriosis is severe, which can result in fetal loss, preterm labor, sepsis, meningitis, and death. But the key solution for prevent infection is to manage maternal listeriosis better, although which is diagnostic challenged. We summarized the clinical characteristics, clinical and laboratory findings and outcome of perinatal listeriosis.

Methods

We collected 4 cases of perinatal listeriosis. All cases were in pregnant women who had Listeria monocytogenes isolated from cultures of blood or amniotic fluid. We reviewed the Chinese-language literature published between 2010 and 2016. The rate of all kinds of clinical characteristics or event was calculated and compared.

Results

A total of 140 cases were included, stillbirth and abortion rate was 18.2 percents. Vertical transmission occurred for 94.1% neonates, and the mortality was 26.8%. Almost 85.9% of maternal illnesses were first onset on fever and 86.8%, 23.8% of neonate was sepsis, central nervous system infection aspect. The rate of premature infants, low weight, fetal intrauterine distress and amniotic fluid turbidity were between 40%~60%, meanwhile their difference between neonate dead and cured cases was significant. Those women who treated with cephalosporins all have miscarried or stillbirth. Almost the neonates recovered were treated with ampicillin or penicillin.

Conclusions

Most pregnant women with listeriosis had no additional predisposing factors and fever was the most common symptom. A timely and precise identification for pathogen is vital for clinical therapeutic schedule and pregnancy outcomes. Uncertain fever pregnant women should be highly suspect, and blood culture is indispensable for early detection and response.
High Sensitivity Determination of TNF-α for Early Diagnosis of Neonatal Infections with a Novel and Reusable Electrochemical Sensor
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Background and aims

Early diagnosis is vital for the reduction of mortality caused by neonatal infections. Since TNF-α can be used as a marker for the early diagnosis, the detection of TNF-α with high sensitivity and specificity has great clinical significance.

Methods

Herein, a highly sensitive and reusable electrochemical sensor was fabricated. Due to the high specificity of aptamers, TNF-α could be accurately detected from five similar cytokines, even from serum samples. In addition, Au nanoparticles (AuNPs) with a high surface area were able to combine a large number of doxorubicin hydrochloride (DOXh), which made the sensor have a high sensitivity.

Results

The sensor had a good linear relationship with TNF-α concentration in the range from 1 to 1×10⁴ pg/mL and the lowest detection limit is 0.7pg/mL. More important was that the sensor could be reused 6 times by a crafty use of chain replacement reaction. Meanwhile, the detection time and cost were greatly reduced.

Conclusions

Thus, we believe that these advantages of higher specificity and sensitivity, lower cost, and shorter detection time will provide a stronger potential for early diagnosis of neonatal infections in clinical applications.
ANALYSIS OF CLINICAL FEATURES ON NEONATES WITH HERPES SIMPLEX VIRUS TYPE 2 DISSEMINATED INFECTION
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Background and aims
To investigate the clinical features of on neonates with herpes simplex virus type 2 (HSV-2) disseminated infection.

Methods
Analyze the clinical features and outcome of neonates with HSV-2 disseminated infection, review the literature of case reported and do the retrospective analysis.

Results
Neonates HSV-2 disseminated infection is comparatively rare in clinical, but causes significant morbidity and mortality and leaves many survivors with permanent sequelae. The majority are acquired prenatally and most infected infants are born to mothers without a history of HSV infection. The diagnosis of disseminated disease is often delayed until the second week of life, due to subtle and nonspecifically manifestation. Disseminated infection may have localized skin, eye, and mouth (SEM) and central nervous system (CNS) involvement with multiple organs. The major manifestation includes sepsis-like presentation, mucocutaneous lesions, meningoencephalitis, progressive pneumonitis and hepatitis. Using DNA PCR test in obtained specimens from skin lesions, blood, CSF and tracheal aspirates in intubated infants is help to fast evaluate disseminated disease. Acyclovir is still recommended as the first line antiviral agent with course at least 21 days and ganciclovir is an alternative. For those refractory cases, extended course is seemed reasonable and necessary.

Conclusions
To clarify a diagnosis early, efforts are focused on identifying high-risk neonates with a sepsis-like picture, progressive pneumonitis, CNS abnormalities, who should undergo testing for HSV and prompt empiric antiviral treatment.
Background and aims

The manifestations of CMV infection in newborns, both congenital and acquired, can vary from polyorganic to affecting organs in an isolated manner. Our observation concerns patients with CMV infection associated with liver damage with cholestasis. We evaluate the clinical characteristics and short-term outcomes of patients with CMV infection, which is manifested primarily by liver damage.

Methods

During the period 2016-2017 we observed 5 children, the average age was 2.17 ± 0.5 months with the diagnosis of CMV-hepatitis with cholestasis. The diagnosis of CMV infection was established based on the detection of CMV DNA in blood cells, urine, and detection of IgM antibodies.

Results

Four examined patients were full-term (birth weight 2670-3520g), 1 girl was prematurely (32 weeks, 1500g). Patients were hospitalized because of prolonged jaundice, increased abdomen’s size, leukocytosis, increased size of liver according to ultrasound. 2 children were diagnosed with congenital CMV infection in other institutions, accompanied of acute renal failure in 1 case, in the other case hepatomegaly was revealed. After the diagnosis was confirmed, patients received an human cytomegalovirus immunoglobulin. In 4 cases, clinical improvement was noted in the form of a decrease in bilirubin, GGT, normalization of ALT and AST. In 1 patient ganciclovir was assigned, which led to the elimination of the virus.

Conclusions

CMV infection, both congenital and acquired, sometimes manifests in the form of hepatitis with cholestasis syndrome. With isolated liver damage, therapy with human anti-cytomegaloviral immunoglobulin may be sufficient. A short prognosis is favorable, however, all children who have undergone CMV-hepatitis show prolonged follow-up.
CLINICAL ANALYSIS OF NEONATAL PURULENT MENINGITIS
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Objective: a research about the clinical diagnosis, opportune time for lumbar puncture and the medicine treatment for neonatal purulent meningitis.

Methods: Review the clinical datas of 43 cases of neonatal purulent meningitis, which have typical changes of the cerebrospinal fluid (CSF) in Tianjin children’s hospital from October 2012 to April 2015. Analyzed their clinical characteristics, including clinical manifestations, peripheral white blood cells, blood C reactive protein (CRP) and other laboratory values of the CSF. Obtain the opportune time for lumbar puncture. Gave 15 patients with Penicillin and Ceftriaxone (Rocephin), gave 21 patients with Penicillin and Cefepime (Maxipime), gave 3 patients with Piperazine and Cefepime (Maxipime), gave 2 patients with Piperazine and Ceftazidime (Fortum) and gave 2 patients with Meropenem (Mepem).

Results: 17 cases recovered, 16 cases improved, 10 cases gave up treatment. The 15 cases who were treated with Ceftriaxone (Rocephin) had normal temperature in 2.33 ± 1.56 days and the CSF became negative in 12.08 ± 2.78 days; The 21 cases who were treated with Cefepime (Maxipime) had normal temperature in 2.18 ± 1.40 days and the CSF became negative in 10.90 ± 4.05 days.

Conclusion: CSF examination should be done as soon as possible in the patients who have suspected sepsis and significant infective symptoms, it is necessary to recheck the lumbar puncture in 3-5 days in the patients who is consider to be meningitis but the first CSF check was normal. Ceftriaxone (Rocephin) and Cefepime (Maxipime) have same efficacy in the treatment of neonatal meningitis, both of them can be the first choice to treat neonatal meningitis.
NEONATAL HERPES SIMPLEX VIRUS INFECTION: TWO CASE REPORTS AND DISCUSSION

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Background and aims

Herpes simplex virus (HSV) infection in the newborn is a uncommon disease with devastating consequences, also is one of the major causes of acute liver failure and acquired hemophagocytic lymphohistiocytosis. HSV infection associated neonatal liver failure (NLF) is a rare but often fatal disease.

Methods

We describe herewith two neonates with HSV infection.

Results

One with fulminating hepatic disorder, who successfully responded to high-dose corticosteroid therapy 72 hours after the onset of disease, prevented the disease progression to NLF. However, the other died two months later.

Conclusions

Early antiviral therapy is important to prevent progressive liver function injury, enough duration may change outcomes.
RESPIRATORY SYNCYTIAL VIRUS PNEUMONIA IN YOUNG CHILDREN ADMITTED TO A TERTIARY CARE PEDIATRIC HOSPITAL IN SOUTH INDIA: A MICROBIOLOGY BASED PRELIMINARY OBSERVATION

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Background and aims

Viruses are the most often encountered pathogens that cause childhood pneumonia. Respiratory syncytial virus (RSV) is recognized as the most important pathogen causing acute lower respiratory tract infections (ALRTI) in children. This study aimed to evaluate the prevalence of RSV in young children admitted to a tertiary care pediatric hospital in South India, as evidenced by a Real Time Polymerase Chain Reaction (RT PCR) for RSV.

Methods

A total of 155 children admitted for ALRTI between July 2015 to January 2017, were included in this study. RT PCR for RSV was performed on throat swabs collected from 89 children where there was a clinical suspicion of ALRTI due to RSV.

Results

Out of the 89 specimens tested, 60 were found to be positive for RSV (67.4%). RSV pneumonia was often seen in children less than one year (52/60, 86.6%) and frequently encountered in male children (M:F=2.1:1). Prevalence was high during the monsoon season (July to September).

Conclusions

Our preliminary observation shows a high prevalence of RSV pneumonia in the population studied. The high prevalence may be attributed to the tertiary care pediatric hospital setting where the study was performed. It was interesting to note that a simple throat swab was suitable and very efficient for the detection of RSV by RT PCR.
ASSOCIATION BETWEEN PNEUMOCOCCAL DNA LOAD IN NASOPHARYNX AND ETIOLOGY IN PEDIATRIC PNEUMONIA

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ASSOCIATION BETWEEN PNEUMOCOCCAL DNA LOAD IN NASOPHARYNX AND ETIOLOGY IN PEDIATRIC PNEUMONIA

Background and aims

Quantitative pneumococcal PCR may have a role in the differentiation of infection from colonization.(1-3) We aimed to study the association between pneumococcal DNA load in the nasopharynx and pediatric pneumonia diagnosed as bacterial pneumonia.

Methods

In a previous prospective study on healthy children < 18 years, 265 cases with radiologically proven pneumonia were included, and we identified a causative pathogen in 223/265 (84%; 63% with single viral, 8% with atypical bacterial infection and 13% with typical bacterial etiology (11% pneumococcal)), as previously described.(4) In the subgroup of 223 cases of pneumonia with found etiology we performed pneumococcal PCR (lyt A) on nasopharyngeal samples. Ct-values were used as an indirect measure of pneumococcal DNA load. Cut off for positive test was Ct 40.

Results

Pneumococcal PCR was available in 163/223 cases. Positive nasopharyngeal pneumococcal PCR according to categorized Ct-value:

<table>
<thead>
<tr>
<th>Ct-value</th>
<th>Bacterial pneumonia (n = 23)</th>
<th>Viral/atypical pneumonia (n=140)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>7 (30.4%)</td>
<td>67 (47.9%)</td>
<td>p = 0.04⁵</td>
</tr>
<tr>
<td>&lt; 25</td>
<td>3 (13%)</td>
<td>2 (1.4%)</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>6 (26.1%)</td>
<td>29 (20.7%)</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>5 (21.7%)</td>
<td>27 (19.3%)</td>
<td></td>
</tr>
<tr>
<td>≥ 35</td>
<td>2 (8.7%)</td>
<td>15 (10.7%)</td>
<td></td>
</tr>
</tbody>
</table>

All numbers are given as n (% of total in column). ⁵Chi² tests comparing bacterial versus viral/atypical pneumonia cases and different Ct-values.
Conclusions

We found a significant association between high pneumococcal DNA load in nasopharynx and evidence of bacterial pneumonia, although the clinical utility may be limited amongst other given the high number of negative nasopharyngeal pneumococcal PCR also in the bacterial category.

References:

Background and aims

Human rhinovirus (RV) infection is the leading respiratory virus causing respiratory tract infections and it precedes a higher prevalence in children with asthma exacerbations than those with controlled asthma. From the clinical epidemiology data, RV-A and RV-B mainly cause self-limiting upper respiratory tract infection. RV-C has an extended niche in causing bronchiolitis, pneumonia and shared the responsibility with RV-A in their association with wheezing illness and asthma exacerbation. Because of the unavailability of the infectious RV-C stock, there is never an attempt to develop small-animal models for RV-C. This hinders the investigations of RV-C pathogenesis and the development of RV-C therapeutics.

Methods

Prototype rhinovirus from the minor and major group, and a RV-C15 were reconstructed using plasmid based reverse genetic methods. These RVs were propagated in H1-HeLa cell while the RV-C was propagated in the CDHR3-expressing cell. The infectious stocks were quantified using plaque assay.

Primary respiratory explant culture models were established from Mus musculus, Mustela putorius furo, and Sus scrofa were infected with RVs. The replication kinetics of the RVs were examined by monitoring the viral load from 1 to 120 hour-post-infection (hpi).

Results

Sus scrofa has the highest RV-C receptor homology with human. Upon infection, the viral gene copy detected in the supernatant increased from day 1 to 5 post-infection in the tracheal, bronchial and lung explant cultures.

Conclusions

The explant models identify that Sus scrofa would be an appropriate in vivo animal model to study RV-C pathogenesis. This study design minimizes the number of animal needed for the same test.
Serotype Distribution of Streptococcus Pneumoniae and Potential Impact of Pneumococcal Conjugate Vaccines in China: A Systematic Review and Meta-analysis

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Background and aims

Streptococcus pneumoniae (S. pneumoniae) is an important cause of community acquired infections. To update the research evidences for the pneumococcal serotypes distribution and estimate the potential impact of pneumococcal conjugate vaccines (PCVs) and pneumococcal polysaccharide vaccine (PPSV) in mainland of China, we performed a systematic review and meta-analysis on the relative publications from Chinese population.

Methods

This systematic review and meta-analysis was conducted on the pneumococcal serotype distribution publications in mainland China from 2000 to 2016. Literatures were searched in PubMed, Ovid-EMBASE, Web of science, CNKI and Wanfang. At length 85 publications had been included. The collected isolates were stratified by age group, source, and region to obtain pneumococcal serotypes and pooled PCVs serotypes coverage rate with random-effect model in Stata SE 12.0.

Results

A total of 16,945 S. pneumoniae isolates were finally included in this meta-analysis, 11,987 (71%) isolates were from children under 18 years old. Among 11,987 isolates from children, 5,907 (49%) isolates were certainly identified from children under 5 years old. For the children under 18 years old, the most common serotypes were 19F 29.1%, 19A 9.9%, 23F 9.1%, 14 8.4%, 6B 7.2%, and the pooled coverage for PCV10 serotypes were 52.3% (95%CI: 44.3%-60.3%), PCV13 were 68.4% (95%CI: 60.8%-76.0%) and PPSV23 were 65.5% (95%CI: 58.0%-73.0%) respectively.

Conclusions

The most common pneumococcal serotype in children was 19F in mainland of china. The serotype coverage of PCV13 and PPSV23 were high in mainland of China. We could achieve great benefit if universal immunized PCV or PPSV in China.
A MULTICENTER STUDY OF HUMAN CORONAVIRUS INFECTIONS IN CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA

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9 Guangzhou Women and Children's Medical Center, Respiration Department, Guangzhou, China
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Background and aims

HCoVs are important viral pathogens for respiratory infections. The aim of this article is to investigate HCoVs infection in children with CAP.

Methods

During 2014 and 2016, the NPAs from children diagnosed with CAP were collected from 13 pediatric hospitals in six regions of China. Respiratory specimens were screened. The epidemiological characteristic and severe pneumonia of above children were analyzed.

Results

The total positive rate of the viruses was 52.9%. HCoVs were detected in 77 patients, OC43 was the most prevalent with positive rate of 1.38%; The detection rate peak was 4.92% in spring in the north China. While was 3.56% in spring in the south China. Positive rate of HCoVs infections in 0-1 year group, 1-3 year group, 3-6 year group and ≥6 year group were 3.48%, 2.52%, 2.58% and 1.11%, respectively. (χ²=8.809, P=0.032); The highest positive rate of HCoVs in four age groups in six regions was 0-1 year group in North China, 0-1 year group in northeast region, 0-1 year in northeast region, 1-3 year in East China region, 0-1 year in southwest and 0-1 year in the South China region; There were 8 severe pneumonia cases among HCoVs positive patients. Six patients were single infection of HCoVs, including 5 cases associated with pleural effusion or acute respiratory failure.

Conclusions
HCoVs was an important viral pathogen in children with CAP. HCoVs infections are common in children under 3 years old. HCoVs infection can cause severe pneumonia and severe complications.
Background and aims

*Mycoplasma pneumoniae* (MP) is a common pathogens of childhood pneumonia. Recently, MP pneumonia that does not respond to macrolide therapy has increased. Macrolide-responsiveness is mediated by gene mutation, but it is reported that other causes are involved. Therefore, tetracycline, quinolone, and corticosteroids have been proposed as alternative treatments. We aimed to compare the therapeutic efficacy of prolonged macrolide, corticosteroid, minocycline, and levofloxacin against macrolide-unresponsive MP pneumonia.

Methods

We retrospectively analyze medical records of children with macrolide-unresponsive MP pneumonia (fever >48-72 hr after macrolide treatment) treated between 2015-2017 at Gil Medical Center. Cases were divided into four groups based on secondary treatment (prolonged macrolide, corticosteroid, minocycline, and levofloxacin). We compared their clinical manifestation, laboratory findings and outcomes.

Results

Data were collected from 126 children (prolonged macrolide group (n = 86), the corticosteroid group (n = 19), minocycline (n = 14) and levofloxacin (n = 7)). Fever duration after the secondary treatment was 67.9 hrs in prolonged macrolide group, 28.8 hs in corticosteroid group, 27.7 hs in minocycline, and 21.6 hs in levofloxacin group (P = 0.000). There was no significant difference in fever duration when comparing between corticosteroid – minocycline and between corticosteroid- levofloxacin. There was one patient who had improved by combination therapy of corticosteroid and levofloxacin after treatment failure with corticosteroid alone. All patients in corticosteroids, minocycline, and levofloxacin groups did not show any side effects.

Conclusions

Corticosteroids, minocycline, and levofloxacin were more effective than prolonged macrolide therapy in childhood MP pneumonia that did not respond to macrolide therapy and were safe.
A RARE CASE OF PLEURAL MYCOBACTERIUM KANSASII (NTM) INFECTION IN SYSTEMIC JUVENILE IDIOPATHIC ARTHRITIS
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Background and aims

Mycobacterium kansasii infection presented with pleural effusion is extremely rare, as comparison with pulmonary infection in children. Initial correct diagnosis of M. kansasii is essential because treatment is different from tuberculosis. We experienced the case of systemic juvenile idiopathic arthritis (sJIA) who presented with massive pleural effusion during treatment with DMARDs.

Methods

Case presentation

A 7-year-old girl was diagnosed as sJIA on the base of persistent fever, arthralgia, and skin rash. The patient was admitted to hospital due to dyspnea after 6 months of sJIA on medication. Chest X-ray and HRCT showed lobulated pleural effusion as well as ground-glass opacity of both lung. Initial laboratory results showed infection markers elevation (WBC: 7900/uL, Neutrophil: 65.3%, Lymphocyte: 21.8%, monocyte: 12.4%, ESR: 52mm/hr, CRP: 16.35 mg/L). IGRA (TB spot) and all viral respiratory pathogen were negative. Bronchoscopy with BAL showed AFB smear and culture negative. Diagnostic thoracentesis revealed exudative effusion with high ADA level (327.7 U/L). AFB smear from pleural fluid was positive but RT PCR for tuberculosis revealed negative.

Results

NTM culture confirmed pathogen as M. kansasii. The patient was started on rifampin, ethambutol, macrolide therapy. After 6 months of treatment, fever subsided finally and infection markers decreased to normal (ESR:2mm/hr, CRP: <0.60 mg/L). Pleural effusion was diminished in right lung but large amount of pleural effusion still remained in left lung.

Conclusions

Pleural effusion with M. kansasii infection is extremely rare pattern of NTM infection. We experienced a prolonged fever in M. kansasii infection with sJIA.
Background and Aims

No large-scale data analysis is available on the common respiratory tract infections pathogens among children with acute respiratory infection (ARI) in north of China. A study on the characteristics of respiratory infection pathogens was conducted in Tianjin, China.

Methods
Cohort of 17516 hospitalized children younger than 16 years with respiratory tract diseases from March 2016 to February 2017 were routinely examined by direct immunofluorescence assay to detect respiratory agents including nine respiratory pathogens. Data were analyzed to describe the frequency and seasonality.

Results

Overall, the popular respiratory pathogens were Mycoplasma pneumoniae (22.16%), Influenza B virus (Flu B) (1.64%). The high rate of Mycoplasma pneumoniae (MP) were found in spring, while Respiratory syncytial virus (RSV), Influenza B virus (Flu B), and Parainfluenza virus (PIV) detected peaked in winter. Each of the respiratory pathogens was susceptible to different groups, MP occurred in 3-6 years old (31.6%), ADV in 1-3 years old (1.0%), RSV in ≤1 year old (1.1%), Flu B in ≥3 years old (2.4%), and PIV in >1 year old children (0.7%).

Conclusions

These findings provided a better understanding of virus distribution among different ages and seasons, all of which will contribute to modification of therapeutic approaches and development of effective prevention strategies for each respiratory virus infection during peak seasons.
Background and aims

Pulmonary nocardiosis is an infrequent disease with polymorphic presentations. There have been still few reports about PN, especially the reports on PN of children. Retrospective analysis of two PN patients with risk factors, clinical manifestations, diagnosis, treatment and prognosis is presented in the article. By reviewing the literature, it aims to improve the knowledge of PN and reduce the mortality rate.

Methods

The article summarizes and analyzes underlying diseases, immune function, clinical manifestations, pulmonary imaging findings and effect of the treatment of the case with related literature review.

Results

Two cases of PN were identified. One was a child and the other was an adult. First was due to long term use of glucocorticoid with ITP, the other had chronic malnutrition with hypoalbuminemia. Both had fever, cough, multiple plaques, mass consolidation and pleural effusion in CT of the chest. Both received compound preparation of TMP-SMX. One got better, and the other gave up treatment. PN is common in patients with underlying disease and impaired immune function, as well as in immunocompetent individuals. Fever and cough are the most common symptoms, and the imaging features are lack of specificity. The combination drug based on TMP-SMX is recommended.

Conclusions

(1) PN is a rare and serious infection in children. (2) The clinical features and imaging findings are lack of specificity. (3) Empiric therapy is associated with the use of TMP-SMX alone or in combination with other antibiotic therapies. (4) It is preliminarily confirmed that PN in children is no different from adults in risk factors, clinical manifestations and imaging changes.
BACKGROUND AND AIMS: Protracted bacterial bronchitis (PBB) is increasingly recognized as a major cause of chronic wet cough in children. We aim to further describe the clinical features, etiology and treatment in Chinese children with PBB confirmed by bronchoscopy.

METHODS: The hospitalized children who had over 4 weeks cough from June, 2014 to December, 2016 were investigated retrospectively. We defined children as PBB (n=50) if having a chronic wet cough without signs of an alternative cause and responds to 2 weeks of appropriate antibiotics, positive bacterial culture and/or increase of neutrophils in bronchoalveolar lavage fluid (BALF). Those did not fulfill the above criteria was divided into the control group (n=48).

RESULTS: In the PBB group, there were 36 boys and 14 girls. The median (IQR) age was 3.2 (2.0-4.0) years and 58.0% cases were under 3 years. Thirty children were accompanied by wheezing. Airway malacia was found in five cases. The average (IQR) of neutrophils in BALF was 0.63 (0.50-0.82), which was significantly higher than that in the control group (P<0.01). Serum immunoglobulin G (801.5mg/dl; IQR, 657.8-958.3, P<0.05) and CD16+56 (12.2%; IQR,8.9-16.4, P<0.05) were significantly lower than that in the control group. 36 isolates were identified from BALF in children with PBB, the common pathogens were Streptococcus pneumoniae (n=19), Haemophilus influenzae (n=5) and Moraxella catarrhalis (n=4). All children received a 2-3 weeks course of antibiotics. The majority (n=48) received oral amoxicillin/clavulanic acid.

CONCLUSIONS: PBB occur mainly in younger children and often co-exist with wheezing. Streptococcus pneumoniae is the leading pathogen in Chinese children with PBB.
Background and aims

Community-acquired pneumonia (CAP) is a worldwide cause of morbidity and mortality in children. Human adenovirus (HAdV) is one of the most common viral pathogens associated with CAP. However, there was no multicenter study of HAdV infection in pediatric CAP in China. This study was aimed to investigate the molecular epidemiology of HAdV in pediatric CAP in China.

Methods

Between November 2014 and November 2016, 2647 hospitalized pediatric patients with CAP were enrolled in this study from 13 hospitals in Northern and Southern China. Respiratory specimens were collected for screening 18 respiratory viruses by using multiplex RT-PCR. HAdV was genotyped on Hexon gene sequence of HAdV. The clinical data were collected and analyzed.

Results

The positive rate of HAdV was 4.65%(123/2647), and the HAdV positive patients accounted for 4.74%(48/1013) and 4.59%(75/1634) in Northern and Southern China, respectively. The HAdV positive rate of children at the age of < 1 year old, 1-3 years old, 3-6 years old and ≥6 years old was 3.34%(28/838), 5.72%(47/822), 5.29%(30/567) and 4.29%(18/420), respectively. Total 6 genotypes of HAdV, including HAdV-1(n=11), HAdV-2(n=16), HAdV-3 (n=31), HAdV-4 (n=1), HAdV-5 (n=8), HAdV-7 (n=8), were detected. The predominant HAdV genotypes were HAdV-3 (8/27) and HAdV-7 (6/27) in Northern China, while HAdV-3(23/48) and HAdV-2 (12/48) were the most prevalent genotypes in Southern China.
Conclusions

The detection rate of HAdV in pediatric CAP was 4.65% in this study. The highest positive rate of HAdV was in children group aged 1-3 years old. The predominant HAdV genotypes were different between Northern China and Southern China.
ORMDL3 MAY PARTICIPATE IN THE PATHOGENESIS OF BRONCHIAL EPITHELIAL-MESENCHYMAL TRANSITION IN ASTHMATIC MICE WITH AIRWAY REMODELING

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Background and aims

Asthma is caused by a complex interaction of genetic and environmental factors. Orosomucoid-like 3 (ORMDL3) is a candidate gene that has been strongly linked to asthma, but the underlying mechanisms are unknown. ORMDL3 regulates the expression of metalloproteinases and TGF-β, and ORMDL3 transgenic mice exhibit increased airway remodeling. Hence, ORMDL3 may be associated with airway remodeling. We attempted to examine ORMDL3 induces epithelial-mesenchymal transition (EMT) in the bronchial epithelium of asthma.

Methods

BALB/c mice were assigned to control and asthma groups. We observed airway remodeling in asthmatic mice by hematoxylin and eosin (HE) and Masson staining. Morphological changes in the bronchial epithelium were assessed by transmission electron microscopy. The EMT-related indicators E-cadherin (E-cad), fibroblast-specific protein 1 (FSP1), and Vimentin (VIM) were assessed by western blotting and real-time PCR at different time of airway remodeling in asthmatic mice to detect the EMT trend. Then, the localization of ORMDL3 was observed by immunohistochemistry, and its protein and mRNA expression was examined by western blotting and real-time PCR, respectively. Furthermore, the bronchial epithelial cell line 16HBE14o- was transfected with an ORMDL3-expressing plasmid, and changes in E-cad, FSP-1, and VIM were detected by immunofluorescence, western blotting and real-time PCR, and cell invasive ability was assessed by microscopy.

Results

ORMDL3 expression in the bronchial epithelium was correlated with airway remodeling and EMT progression in vivo. Transfection of ORMDL3 into 16HBE 14o- cells in vitro induced EMT.

Conclusions

ORMDL3 may regulate EMT in the bronchial epithelium, thereby affecting airway remodeling in asthma.
ADVANCEMENT AND EVALUATION OF QMPCR TARGETING PLY, LYTA, PSAA AND SPN9802 GENES FOR THE IDENTIFICATION OF STREPTOCOCCUS PNEUMONIAE IN SERUM SAMPLES
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Background and aims
Invasive pneumococcal disease (IPD) is the leading cause of vaccine-preventable deaths among children under five worldwide. Establishing Streptococcus pneumoniae as an etiology of IPD, however, is challenging due to the limitations of culture methods. This study was designed to evaluate four different gene targets using qmPCR technique for the identification of S. pneumoniae in comparison with the culture method.

Methods
Fifteen hundred and four children ≤5 years, with clinically diagnosed IPD, raised cell count, positive Procalcitonin and C-reactive protein test result with chest radiograph findings of pneumonia were enrolled. In addition, 56 healthy negative controls were also included. Blood and serum samples collected were subjected to culture and qmPCR targeting ply, lytA, psaA & spn9802 genes.

Results
Pneumococcal infection was identified in 7.2% (n=108) of blood culture and 30.3% (n=456) of qmPCR. The sensitivity and specificity of qmPCR was 100% for the controls. Individually, the highest positivity was observed for the lytA target (98%, n= 447/456). Combination of ply+lytA among 2 targets and ply+lytA+psaA among 3 targets provided highest positivity result of 94 and 90%, respectively. Average genome copies/µl was seen maximum for lytA (1.3 x 10^4) followed by ply (1.08 x 10^4) and psaA (9.4 x 10^3). Spn9802 target showed minimum bacterial load (6.8 x 10^3) with high Cq values.

Conclusions
The detection of invasive pneumococcal infection by qmPCR was substantially higher compared to culture. Evaluation of different genes revealed that lytA is an ideal target. However, to overcome the issues of false positivity, qmPCR targeting ply+lytA+psaA is the ideal approach to detect S. pneumoniae.
Background and aims

PCV10 was introduced into the routine immunisation schedule in the Kathmandu Valley in August 2015, using a unique 3 dose schedule at 6 weeks, 10 weeks and 9 months of age. As part of a PCV10 impact assessment, we assessed serotype-specific NP pneumococcal carriage in Nepalese children admitted to our hospital with pneumonia, as well as in age-stratified children in the community.

Methods

From March 2014, children aged 2 months–14 years hospitalised with pneumonia were enrolled. In addition, children aged 6–60 months attending routine outpatient department appointments were enrolled annually. NP swabs were taken from participants, cultured for pneumococci and serotyped by the Quellung method at Patan Hospital, Kathmandu.

Results

In these analyses, children enrolled in 2014/2015 represent a "pre-vaccine" period, and 2016 represents a "post-vaccine" period. 613 children were enrolled with pneumonia <24 months of age. Among these children, pneumococcal carriage prevalence was 42% (57/137), 37% (63/171) and 26% (79/305) in 2014, 2015 and 2016, respectively. There was a 50% decrease (15.2% to 7.5%, p=0.004) in carriage of PCV10 serotypes between the two periods.

Among children in the community aged 6–24 months, pneumococcal carriage prevalence was 70% (804/1147), 56% (332/592) and 62% (711/1149) in 2014, 2015 and 2016, respectively. There was a 40% decrease (19.7% to 12.2%, p <0.001) in carriage of PCV10 serotypes between the two periods.

Conclusions

Early data following the introduction of a PCV10 programme in Nepal provide evidence of vaccine impact supporting the use of pneumococcal conjugate vaccines in South Asia.
CHEST RADIOGRAPH FINDINGS CORRELATE WITH THE CLINICAL COURSE OF MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN

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Background: Chest radiographs (CXRs) are frequently performed to evaluate pneumonia in children. The aim of this study was to analyze the CXR findings of childhood *Mycoplasma pneumoniae* pneumonia and its correlation with clinical manifestations.

Methods: This study includes 411 children diagnosed with *M. pneumoniae* pneumonia between 2010 and 2015. Clinical manifestations were reviewed and CXRs were categorized as normal, lobar consolidation, patchy consolidation, nodular opacity, bilateral parahilar infiltration, or mixed pattern. The pediatricians and radiologists were all blinded to both results.

Results: CXRs performed at initial presentation were abnormal in 383 (95.5%) children. Patchy consolidation (28.9%) and bilateral parahilar infiltration (28.2%) were the two most common findings, followed by nodular opacity (18.5%) and lobar consolidation (12.2%). Children with normal CXRs had the shortest fever duration (7 days, \( P < 0.001 \)), more frequent wheezing (38.9%, \( P = 0.001 \)), and received the least macrolide treatment (66.7%, \( P = 0.004 \)). Lobar consolidation was associated with longer fever duration (13.5 days, \( P < 0.001 \)), frequent decreased breath sound (73.5%, \( P < 0.001 \)) and parapneumonic effusions (77.6%, \( P < 0.001 \)). All lobar consolidation cases received macrolide treatment (\( P = 0.004 \)) for the longest duration (16 days, \( P < 0.001 \)). Bilateral parahilar infiltration cases frequently accompanied rales (72.6%, \( P < 0.001 \)) and had the fewest parapneumonic effusions (7.1%, \( P < 0.001 \)).

Conclusions: CXR findings of children with *M. pneumoniae* pneumonia explain the clinical course; normal CXRs was associated with milder clinical findings, whereas lobar consolidation cases accompanied longer fever duration with more parapneumonic effusions requiring longer treatment.
ASSESSMENT OF THE IN VITRO ANTIVIRAL ACTIVITY OF OSELTAMIVIR FREE BASE AGAINST INFLUENZA VIRUSES ISOLATED IN KOREA BETWEEN 2003 AND 2016

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Background and aims

Oseltamivir phosphate has been used as a neuraminidase inhibitor for treating influenza patients. Recently, oseltamivir free base was manufactured by a Korean pharmaceutical company, and its liquid preparation for pediatric patients was also produced. This study was conducted to evaluate the in vitro antiviral activity of the newly developed oseltamivir free base.

Methods

The ester prodrugs of oseltamivir phosphate and oseltamivir free base and their active metabolite, oseltamivir carboxylate, were hydrolyzed by human liver microsomes, and the converted compounds were used for the neuraminidase inhibition (NI) assay and enzymatic assay. The fluorescent NI assay against influenza A and B viruses isolated in Korea between from 2003 and 2016 was performed using a commercially available kit. The catalytic activities of oseltamivir phosphate and oseltamivir free base were monitored using liquid chromatography tandem-mass spectrometry.

Results

In the NI assay, the IC₅₀ values were not significantly different among oseltamivir phosphate, oseltamivir free base and oseltamivir carboxylate. In the enzymatic assay, the hydrolysis rates of oseltamivir free base and oseltamivir phosphate were significantly different. Also, the Vₘₐₙₐ and Kₘ values of oseltamivir free base were significantly higher than those of oseltamivir phosphate.

Conclusions

The oseltamivir free base showed a comparable IC₅₀ value against influenza viruses isolated in Korea and superior enzymatic kinetic results to the oseltamivir phosphate. Therefore, oseltamivir free base is expected to be a useful neuraminidase inhibitor, and this should be confirmed by future clinical trials.
ETIOLOGY AND PATHOGEN ANALYSIS OF HOSPITALIZED CHILDREN OF ACUTE RESPIRATORY TRACT INFECTION IN THE SPRING FROM 2015-2017
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Objective
Analyse the etiology and pathogen of hospitalized children of acute respiratory tract infection (ARI) in the spring from 2015 to 2017 to explore the pathogen distribution and migration of respiratory tract infection. Methods A total of 1,700 general hospitalized children in Union Hospital, Tongji Medical College, Huazhong University of Science and Technology in the spring from 2015 to 2017 were enrolled through retrospective analysis in the study. The clinical information was collected; and the nasopharyngeal aspiration fluid and serum samples were sent for multi-pathogen detection. Adenovirus (ADV), respiratory syncytial virus (RSV), parainfluenza virus type 1-3 (PIV-1-PIV-3) were detected by direct immuno-fluorescence assay. Quantitative ELISA was adopted to detect the specific antibodies of mycoplasma pneumoniae (MP), chlamydia pneumoniae (CP) and legionella pneumophila (LP). Analysis of pathogen detection, and comparison of pathogens in the three spring.

Results
1. The rate of ARI hospitalized children accounted for general hospitalized children in the spring from 2015 to 2017 is 69.55% (402/578), 68.89% (445/646), 66.80% (318/476). 2. Least one type of pathogen was detected in 82 out of 1166 ARI hospitalized children and the overall positive rate was 7.03%. 3. MP was more common pathogen, whose detected rate was 4.63% (54/1166). In the spring, the positive rate of PIV detection was 3.34% (39/1166). 4. Pneumonia still accounts for the first cause of respiratory tract infection, the rate of pneumonia accounted for ARI in the three spring is 72.39% (291/402), 67.19% (299/445), 66.67% (212/318). 5. Pneumonia caused by PIV infection was more common in the three spring, the detection rate was 5.86% (15/291), 4.35% (13/299) and 5.66% (12/212). 6. The positive rate of MP of pneumonia in the three years was increasing. In 2017, the rate of MP rose to 8.96% (19/212), besides the positive rates of MP, CP and LP mixed infection was as high as 2.83% (6/212).

Conclusion
Respiratory infection is still the most common in general disease of children. Furthermore, pneumonia keeps the highest incidence of respiratory infection in children. PIV is the most common source of viral infection in pneumonia in the spring, moreover the infection rate is increasing year by year. In addition, it is worth attention that MP, CP and LP mixed infection in pneumonia plays an important role.
STUDY ON THE METHOD OF ANTIBIOTICS INITIAL SELECTION PROCEDURE TO REDUCE THE USE OF ANTIBIOTICS IN CHILDREN WITH PNEUMONIA

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Background and aims

Antibiotics use rate of CAP in Chinese children is as high as 60% to 78%. Therefore, explore the ways to reduce the use of antibiotics in children with pneumonia.

Methods

A total of 3392 hospitalized children with CAP between 2015 year and 2016 year were studied, aged from three months to 14 years old. The study group (2016 year, 1853 cases) was treated with Antibiotics after admission according to the "Antibiotics Initial Selection Procedure" and compared with the control group (2015 year, 1539 cases) (According to the following project design flow chart: age → whether there are symptoms of infection poisoning ① → inflammation index: peripheral white blood cells ≥ 15 × 1012 / L or neutrophil value ≥ 10 × 1012 / L, CRP ≥ 70mg / L, PCT ≥ 2.0ng / L. whether there are two or more of the above indexes ② → whether meets the characteristics of bacterial pneumonia ③. ①+② or ①+③ or ②+③ If the conclusion is yes, use antibiotics).

Results

The annual average antibiotics use rate of the research group and the control group were 43.6% and 82.3% (P <0.01) respectively. The average hospitalization days were 4.2±1.27 days and 5.1±2.35 days (P <0.01), the average hospitalization costs were ¥3574.58±1106.65and ¥4381.64±1581.39(P <0.01).

Conclusions

The "antibiotics initial selection procedure" can help physicians reduce the use of antibiotics, shorten the hospital stay and reduce hospitalization costs during selecting the children CAP treatment program initially.
STUDY OF PENICILLIUM MARNEFFEI INFECTION IN PEDIATRIC PATIENTS WITHOUT HUMAN IMMUNODEFICIENCY VIRUS INFECTION IN CHINA
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Background and aims

Penicillium marneffei infection has mainly been reported in adults infected with human immunodeficiency virus (HIV); only a limited number of cases have been reported in children. The aim of the article is to study the clinical and laboratory characteristics of P. marneffei in pediatric patients without HIV infection.

Methods

In this study, the medical records of 10 pediatric patients with P. marneffei infection at Guangzhou Women and Children’s Medical Center were evaluated from May 2011 to November 2015.

Results

The duration of symptoms before admission ranged from 8 days to 1 month. Fever was found in all 10 patients. Hepatomegaly and splenomegaly were found in 9/10 and 8/10 patients, respectively. Two patients presented with skin lesions. The main life-threatening complications during hospitalization included hemophagocytic syndrome (8/10), acute respiratory distress syndrome (8/10), disseminated intravascular coagulation (DIC) (7/10), and septic shock (6/10). Two of the 10 patients had underlying immunodeficiencies characterized by an absence of IgG and decreased CD4 and CD8 cell counts, respectively. Phagocytosis in the bone marrow was observed in four patients. Eight patients had abnormal chest radiographs. Only two patients showed remission after treatment. The others died of multiple organ failure and DIC on days 1–17 of hospitalization.

Conclusions

Our analysis suggests that P. marneffei infection is a severe disease causing high mortality even in infants and children without HIV. Pediatric clinicians should be vigilant in identifying this disease to ensure an early diagnosis and good prognosis. A systematic approach to immunological evaluations in pediatric patients with the disease is required.
Background and aims

Hyper-IgE syndromes (HIES) are rare primary immunodeficiencies characterized by remarkably elevated IgE levels, recurrent bacterial infections (especially staphylococcal skin abscesses), chronic eczema and recurrent pulmonary infections. The purpose of the present study is to determine the spectrum of clinical and immunological features of China pediatric patients with HIES.

Methods

In this study, the medical records of 4 pediatric patients who were confirmed with HIES by NIH Score and/or genetic analysis at Guangzhou Women and Children’s Medical Center were evaluated from May 2013 to September 2016.

Results

The most common feature of HIES are recurrent respiratory infection, eczematoid skin lesions to varying degrees, mucocutaneous infection, otitis media (P3 and P4), and food allergies (P2) during the course of disease. All patients had at least one episode of pneumonia. 3 patients emerged cavitation with fungal infection on HRCT (P1, P3 and P4), including invasive Aspergillus (P3, P4) and P. marneffei (P1). The clearest manifestation was markedly elevated IgE of serum by repeated detection (4090-23600IU/ml). Eosinophilia (>0.52×10^9/L) was detected in the patients and the percentage of eosinophils varied from 0.54% to 1.92%. The high counts of CD3+4+ T cells and CD3+8+ T cells were identified in P4 and P2 respectively. P1 and P4 were shown as AD-HIES cases as heterozygous mutations were identified in the STAT3 gene respectively.

Conclusions

Our patients suggest that fungi as the important pathogens for children with HIES needed more attentions. The important dilemma remains when a suspicion of HIES should be raised and further work-up should be initiated particularly in infants.
Pneumonia-related complications are associated with high morbidity and mortality in children therefore early identification of its clinical correlates is important. The study was conducted to identify risk factors and clinical correlates of pneumonia-related complications in Ilorin, North-Central Nigeria.
COMMUNITY ACQUIRED PNEUMONIA IN CHILDREN SEEN IN A RURAL TERTIARY HOSPITAL IN NIGERIA

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Background and aims

Pneumonia is one of the leading cause of morbidity and mortality in children especially those under five years of age. Despite the availability of vaccines to prevent pneumonia in this children in the developed world, such is not commonly accessible and available to children in developing the world especially among rural dwellers. This study is aimed to document the prevalence of pneumonia and outcome in children in this rural tertiary hospital.

Methods

This study presents an analysis of secondary data obtained from a rural tertiary hospital in northwestern Nigeria over a period of one year (1st January to 31st December 2016). Results were presented as means with standard deviation, ratio, tables, figures and Chi-squares with p values

Results

Pneumonia accounted for 8.6% of the total 733 children admitted during the study period. The mean age at presentation was 3.4 ± 1.2 years with the majority aged less than 2 years. More males were affected with M: F of 1.3:1. Seven (11.1%) of the children had lobar pneumonia Majority were discharged home, 1(1.6%) left against medical advice, 3(4.8%) died. Age and sex did not significantly affect mortality.

Conclusions

Pneumonia contributed to significant morbidity in this study. Preventive measures like vaccination, exclusive breastfeeding with good nutrition and environmental control of air pollution should be strengthened
IMPACT OF PNEUMOCOCCAL 23-VALENT POLYSACCHARIDE (PPV23) AND 13-VALENT CONJUGATE VACCINE (PCV13) ON INVASIVE PNEUMOCOCCAL DISEASES (IPD) CAUSED BY SEROTYPE 3 (ST3)

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Background and aims

Two pneumococcal vaccines target ST3: PPV23 and PCV13. We summarize studies assessing the impact of PPV23 or PCV13 on IPD due to ST3.

Methods

A non-systematic review of the literature was performed to identify studies of PPV23 or PCV13 efficacy/effectiveness (VE) or global impact against IPD caused by ST3.

Results

PPV23 has been available for use in adults since 1983 and VE against ST3 IPD has been measured in two studies, one in those ≥5 and another in ≥65 years of age; VE was 42% (95%CI: 5-65) and -23% (95%CI: -85-19), respectively. Direct PCV13 VE among adults was assessed in a large, randomized placebo-controlled trial but the number of ST3 IPD cases was too few to draw firm conclusions. PCV13 VE against ST3 IPD in children <5 years was assessed in 11 studies using different methods and case-definitions. Most studies with sufficient ST3 cases found a statistically significant direct protection against ST3 IPD (VE range of 57-80%), or a decrease in ST3 IPD incidence post-PCV13 introduction in children compared to the pre-PCV13 period. In most ecological studies, ST3 IPD rate in adults did not decrease following PCV13 use in infants.

Conclusions

Studies in children have reported varying degrees of PCV13 protection against ST3 IPD. Population-based surveillance in countries using PCV13 and PPV23 are needed to assess the long-term direct and indirect impact of PCV13 infant vaccination programs in reducing IPD incidence in vaccinated and non-vaccinated individuals, as well as the direct protection against ST3 afforded by these vaccines in adults.
Background and aims

Respiratory infections are a major public health problem in Nunavik. In 2002, in order to control an outbreak of serotype 1 pneumococcal infections, a mass immunization campaign using PPSV23 was implemented, targeting persons ≥ 5 years old. At the same time, PCV7 was introduced into the routine immunization program of infants (3+1 doses). The objectives of this study were to describe the burden of pneumonia and invasive pneumococcal disease (IPD) and to review the recommendations about pneumococcal vaccines use.

Methods

Retrospective analysis of hospitalized pneumonia (1997-2013) and IPD cases (1997-2016) identified in the provincial Med-Echo and MADO databases, respectively.

Results

Incidence rates of hospitalized pneumonia and annual cases of IPD in children < 5 years old are shown in Figure 1 and Figure 2, respectively.
Conclusions
In Nunavik, following the mass immunization campaign using PPSV23 in 2002 and PCV use in children, slight downward trends were observed in pneumonia incidence but rates remain much higher than in the overall population of Quebec. PCVs use induced important modifications in the epidemiology of IPD but their benefit has been eroded by the emergence of non-vaccines serotypes.
Background and aims

This study aimed to evaluate the genetic changes of *Mycoplasma pneumoniae* in Korean children by Multilocus Sequence Typing (MLST). Macrolide resistance was analyzed for each specimen and association between Sequence Type (ST) was investigated.

Methods

*M. pneumoniae* was collected from five tertiary hospitals in Korea during 2000-2016 from patients under 18 years of age with confirmed *M. pneumoniae* infection or community acquired lower respiratory tract infection. Primarily nasopharyngeal aspirates were collected and pleural fluid was obtained where applicable. DNA was extracted from cultivated *M. pneumoniae* or directly from the nasopharyngeal samples. MLST was performed on all isolates and corresponding ST was given. Macrolide resistance was determined by mutations in domain V of the 23S rRNA gene.

Results

Ninety-five *M. pneumoniae* were included in the investigation. The most common MLST was ST3 (65, 68.4%) followed by ST14 (16, 16.8%) and ST15 (4, 15%). Fifty-nine isolates (62.1%) expressed macrolide resistance, all of which owing to A2063G mutation in the 23S rRNA gene of *M. pneumoniae*. Only two STs, ST3 and ST14 showed macrolide resistance (57 of 65 and 2 of 16, 87.7% and 12.5%, respectively). The eBURST analysis revealed predominance of clonal complex (CC) 1 including ST3 from the 2010-2011 epidemics in Korea. The newly identified STs in this study were ST28 and ST31 which were part of CC2.

Conclusions

During the study period, the genetic diversity of M. pneumonia has decreased with predominance of certain genotype (ST3) which showed high prevalence of macrolide resistance.
RAPID DETECTION OF MYCOPLASMA PNEUMONIAE BY FILMARRAY RESPIRATORY PANEL

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Background and aims

Mycoplasma pneumoniae is an important pathogen that causes pneumonia in school-age children. Due to the lack of specificity of early clinical manifestations and radiographic examination of mycoplasma pneumonia and the increasing number of refractory and severe cases in recent years, early rapid detection of Mycoplasma pneumoniae infection in children is essential to improve the prognosis of children.

Methods

Nasopharyngeal swabs or sputum specimens from hospitalized patients with community acquired pneumonia in Shanghai Children's Medical Center were collected from November 2016 to May 2017. The Filmarray respiratory panel was used to detect Mycoplasma pneumoniae infection in those children. The positive samples were validated by PCR and serological methods.

Results

360 children with community acquired pneumonia were enrolled in this study. 39 patients were diagnosed with Mycoplasma pneumoniae infections by Filmarray respiratory panel. 22 patients (47.8%) were infected with virus at the same time. Mycoplasma pneumoniae positive samples were all confirmed to be positive by PCR analysis, 32 samples were confirmed to be positive by Passive agglutination.

Conclusions

FilmArray detection is a rapid and sensitive method for the clinical application of early diagnosis of mycoplasma pneumonia and the diagnosis of mixed virus infection.
Evaluation of Biapenem in 50 patients with severe bacterial community acquired pneumonia in children

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Background and aims

To evaluate clinical efficacy and safety of Biapenem in treating patients with severe bacterial community acquired pneumonia (CAP) in children.

Methods

Fifty patients with severe bacterial CAP were given Biapenem 10mg/kg, q12h intravenously for 7 days. Body temperature change was observed. Blood routine test, Serum C-reactive protein, procalcitonin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), blood urea nitrogen (BUN), creatinine (Cr), arterial blood oxygen pressure (PaO\(_2\)) and oxygenation index (PaO\(_2\)/FiO\(_2\)) were compared before and after treatment. Sputum culture and chest CT were reviewed. Adverse reaction of Biapenem was evaluated.

Results

In the 50 surviving patients with severe bacterial CAP, body temperature decreased significantly to normal within average (2.4±1.5) days. Peripheral white blood cell count reduced significantly from (16.3 ±4.1)×10\(^9\)/L to (6.5±3.7)×10\(^9\)/L after treatment. Serum C-reactive protein level decreased significantly from (65.3±18.9) mg/L to (2.4±1.3) mg/L after treatment. PCT reduced significantly from (5.7±3.8) ng/mL to (0.017±0.008) ng/mL; PaO\(_2\) increased significantly from (77.2±11.9) mmHg to (91.5±13.5) mmHg after treatment. PaO\(_2\)/FiO\(_2\) increased significantly from (314.7±78.1) to (435.7±64.7). All the above comparisons showed statistical significance (P<0.01). No significant difference was observed on ALT, AST, BUN and Cr (P>0.05). Sputum pathogen clearance was 91.7%. The pulmonary inflammatory lesions on chest CT of 46 cases subsided apparently after treatment. No severe adverse reaction was observed in the 50 survivors of severe bacterial CAP.

Conclusions

Biapenem shows good therapeutic effect in patients with severe bacterial CAP.
Background and aims

Objective to investigate the clinical risk factors of Mycoplasma pneumoniae pneumonia in children blocked with mucous plug from airway.

Methods

Retrospective analysis was executed on the clinical data of 130 children, who diagnosed mycoplasma pneumoniae pneumonia and treated with fiberoptic bronchoscopy in our hospital pediatric department between September 2016 to January 2017. The patients were divided into the mucous plug group (n=60) and the control group (n=70) according the performance of flexible bronchoscopy. The clinical manifestations, laboratory examination, radiological features, bronchofibroscopic findings were compared between the two groups. The multiple logistic regression analysis and ROC curve were used to identify the threshold of independent risk factors of the MPP blocked with mucous plug from airway.

Results

Compared with the control group, the fever peak, the fever duration, hospitalization time, white blood cells (WBC, 10^9/L), the percentage of neutrophils (NE%), C-reactive protein (CRP, mg/L), lactic dehydrogenase (LDH, U/L), the proportion of combined with pleural effusion, atelectasis, necrosis and involved lobes more than 2 were higher in the mucous plug group. These indicators have significant statistical significance (P<0.05. The multiple logistic regression analysis and the receiver operating characteristic curve analysis showed that the febrile time≥9.5d, CRP≥30.4 mg/L, and LDH≥343.5 U/L were independent predictors of the MPP blocked with mucous plug from airway.

Conclusions

The fever duration (≥9.5d), increased CRP (≥30.4 mg/L), increased serum LDH (≥343.5 U/L) had certain diagnostic value in children with MPP associated with mucous plug formation.
Background and aims

*Streptococcus pneumoniae* is an important pathogen of pneumonia in human. Human alveolar epithelium acts as an effective barrier and is an active participant in host defense against invasion of bacterial by production of various antimicrobial peptides such as human β-defensin-2 (hBD-2). This study aimed to examine that *S. pneumoniae* induced hBD-2 expression in A549 cell and an essential role of Toll-like receptor 2 (TLR2) and mitogen-activated kinases for the expression of hBD-2 in infected A549 cell.

Methods

A549 cells were infected with *S. pneumoniae* for indicated times.

Results

Exposure of A549 cells to *S. pneumoniae* increased the expression of hBD2 mRNA and protein by the time and multiplicity of infection (MOI) dependent manner. The functional anti-TLR2 significantly inhibited the release of *S. pneumoniae* induced hBD2 in A549 cell. *S. pneumoniae* induced activation of extracellular signal-regulated kinase (ERK) and p38 mitogen-activated protein kinase (MAPK). The hBD2 mRNA production was decreased by pretreatment with p38 MAPK inhibitor but not with ERK inhibitor.

Conclusions

*S. pneumoniae* induces hBD2 release in A549 cell by time and MOI dependent manner. TLR2 and activation of p38 MAPK is involved in *S. pneumoniae* induced hBD2 production in A549 cell.
THE VALUE OF BRONCHOSCOPY ON STEVENS-JOHNSON SYNDROME(SJS) AND TOXIC EPIDERMAL NECROLYSIS(TEN) COMBINED WITH RESPIRATORY FAILURE

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Background and Aim: Stevenson-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are considered to be variants of the same disease with differing severities. They are caused by infection and adverse drug reactions. In the acute phase, SJS and TEN can complicated with respiratory failure. In the recovery period, severe bronchiolitis obliterans or lungs cavity lesions have found. This study intends to explore the cause of SJS and TEN complicated with pulmonary lesions during the acute phase in children.

Method: Through 3 cases and literature review, we retrospect the pulmonary image, bronchoscopic manifestation and pathological changes of TEN and SJS complicated with respiratory failure, to identify the cause of respiratory failure and the pathologic basis of pulmonary lesions in the acute phase.

Result: Respiratory mucosal sloughing and blocking the bronchus is founded in the acute phase of SJS and TEN complicated with respiratory failure. The pathology of sloughy bronchial mucosal suggest necrotic epithelium shedding and bronchial and peribronchiolar inflammatory exudates. Previous case reports also discovered respiratory mucosal sloughing in TEN. After bronchoscopy, respiratory failure of patients can be alleviated rapidly. Respiratory mucosal sloughing may be related to bronchiolitis obliterans (BO) and lungs cavity lesions in the recovery period. Bronchoscopy can save the lives of patients and probably alleviate the long-term pulmonary complications.

Conclusion: During the acute phase of SJS and TEN, respiratory mucosal sloughing and blocking the bronchus is the cause of respiratory failure and the pathologic basis of pulmonary lesions in children.
To evaluate the clinical effect and safety of caspofungin in the treatment of invasive pulmonary fungal infections (IPFIs) in children with leukemia.
One of the most frequent phenotypes of asthma at children is virus-induced asthma (VIA).

The aim was to study some indicators of immunity in children with virus-induced asthma and estimate of the effectiveness of recombinant interferon (IFN)α2b in combination with antioxidants in complex treatment.

34 children with VIA aged from 3 to 7 years were included in this study (1 group – children with acute respiratory viral infection (ARVI) and 2 group – without ARVI). 1 group received complex therapy with recombinant IFNα2b, 1B and 2 group – only complex therapy of asthma. Examination included detecting of CD3+, CD3+CD4+, CD3+CD8+, CD3-CD19+, CD3-CD16+56+, immunoregulation index, levels of IL1β, TNF, IL8, IL6, IFNα, IFNγ, IgE, the expression level of TLR2 and TLR4, antioxidant markers.

We has found decrease of level IFNα and IFNγ at all groups. Level of CD3+, CD3+CD8 were significantly lower in 1 group compared with 2 group (p<0.05). The reliable difference in the level of cytokines, antioxidant markers in groups has not been received. We revealed significantly increase of level of CD3+, CD3+CD4+, IFNα, immunoregulation index, expression of TLR4, and decrease of level CD3-CD19+ and IgE (p<0.05) in children of 1 group. After 6 months after complex treatment with using recombinant IFNα2b we revealed reduction VIA exacerbations from 3.6±0.5 cases to 2.0±0.7 cases and duration of asthma exacerbations in 78% children, achievement of control over a disease at 66.6%.

Revealed changes showed signs of dysfunction of immune system in the group of children with VIA. Using of IFNα2b in the complex therapy of children with VIA has a positive therapeutic and protective effect, increases resistance to ARVI.
EFFECTS OF CURCUMIN ON THE EXPRESSION OF SLPI, TNF-Α AND IL-1Β IN BEAS-2B CELLS INDUCED BY STREPTOCOCCUS PNEUMONIAE

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¹The Second Affiliated Hospital & Yuying Children’s Hospital of Wenzhou Medical U, Department of Pediatric Respiration, Wenzhou, China

To explore the effect of curcumin and curcuminoids (Y20, 6B) on the expression of SLPI, TNF-α, IL-1β induced by streptococcus pneumoniae and the possible mechanism.
Objectives: Influenza A (Novel H1N1) virus was emerged in March - April, 2009 in Mexico city & spread to whole world. 2009 pandemic of Influenza A (H1N1) highlight need for active surveillance, although limited data is available in India. Aim of this study was to assess the burden of infection in Pediatric patients & epidemiological analysis in terms of age, gender and seasonal distribution.

Methods: Retrospective analysis of data was done, January, 2015 to December, 2015. Oropharyngeal & nasopharyngeal samples were collected by nylon flocked swabs. Swabs were transferred in Viral Transport Media (VTM) to reference laboratory by maintaining cold chain & tested by real time reverse transcriptase polymerize chain reaction (qPCR). Positive & negative controls were tested in each cycle for the validation.

Results: 691 patients (39.42%) tested positive from total 1,753 patients. Out of 691 positive patients, 173 (25.04%) patients were pediatrics with 104 males (60.12%) & 69 females (39.88%). Further analysis reveals, 58 neonates & infants (33.53%), 70 young children (40.46%), 18 children (10.40%) & 27 adolescent (15.61%). Majority of positive cases are in February & March.
**Conclusion**: Results indicates males are more affected than females. Young children (3-6) had high number of cases followed by neonate & Infants (0-2) as compared to children (7-12) & adolescents (13-18). Winter months are peak season for infection. Results of this study emphasizes need for further research and evaluation as well as comprehensive surveillance system to know more about Influenza A (H1N1) virus infection in relation to age & gender.

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CHARACTERISTICS OF REFRACTORY MYCOPLASMA PNEUMONIAE PNEUMONIA AND EFFICACY OF THE THERAPY WITH GLUCOCORTICOIDS IN CHILDREN

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Background and aims

To investigate the characteristics of refractory Mycoplasma pneumoniae pneumonia (RMPP) with lobar pneumonia change and efficacy of the therapy with different doses of glucocorticoids in children.

Methods

103 children with Mycoplasma pneumoniae pneumonia (MPP) between September 2015 and February 2016 were studied. There were 52 cases of RMPP and 51 cases of non-refractory MPP. For the children with RMPP, the change of clinical symptoms and imaging were observed after the treatment with routine dose and large dose of glucocorticoids. Then, fiber bronchoscope can be used, the differences in the bronchoaveolar lavage fluid were compared after the treatment with routine dose and large dose of glucocorticoids.

Results

The children in the RMPP group had longer febrile time and hospital stay and were more likely to suffer from extrapulmonary complications. Peripheral blood neutrophil count, CRP, PCT, LDH and D-dimers were higher than these in the MPP group. It was more common that two or more pulmonary lobes were involved synchronally or pleural effusion appeared, the differences were statistically significant ($P < 0.05$). There were no statistical differences that the clinical symptoms, imaging change between the children in the RMPP group after the treatment with routine dose and large dose of glucocorticoids ($P > 0.05$).

Conclusions

It should be alert to the occurrence of RMPP in children with MPP when there was a persistent fever, extrapulmonary complications, increased levels of inflammatory index, pleural effusion or two or more pulmonary lobes involvement. It does not show an advantage with large dose of glucocorticoids on the clinical symptoms.
Rhinovirus (RV) comprises species A, B and C, containing numeric genotypes, and is a major cause of the common cold in children. Recent studies show that RV is associated with severe acute respiratory tract infections (ARTI). The aim of the study was to identify RV genotypes and characterize the clinical presentations of different RV species circulating in one geographic area of Japan.

A total of 194 RV-positive nasal specimens, collected from pediatric outpatients with ARTI between January 2015 and December 2016 in Toyama prefecture, Japan, were typed based on the sequence of the region coding for capsid proteins VP4 and VP2.

RV-A, RV-B and RV-C were found in proportions of 53.6% (104/194), 9.3% (18/194) and 30.9% (60/194), respectively. Overall, 56 different genotypes were identified. Most genotypes were detected at low frequency, but some genotypes, such as RV-A40 (n=9), RV-A78 (n=10), RV-A82 (n=9), and RV-C2 (n=9), were present at a higher rate. RV infections were detected every month with the peaks being spring and fall, while no significant differences in the monthly distribution were observed among RV species during the study period. There were no significant differences in clinical outcome among RV species. However, RV-B was more frequently detected in patients co-infected with other respiratory viruses.

These results show that a wide range of RV genotypes with different levels of frequency were present in one geographic area of Japan. Furthermore, our data suggest that RV-B could contribute to the development of viral co-infections.
Acute Lower Respiratory Infections (ALRI) is the single leading cause of under-five mortality globally and Respiratory Syncytial Virus (RSV) plays a major aetiological role in under-five ALRI. The recent global advances on RSV vaccine call for more recent global data on RSV especially in regions where such is largely lacking. The current study thus set out to determine the prevalence and relevant clinical characteristics of RSV among hospitalized under-fives in a tertiary institution in North-central, Nigeria.

A descriptive cross-sectional study of 120 consecutive children, aged two to 59 months diagnosed with ALRI (pneumonia and bronchiolitis) was conducted over a 12-month period (June 2015 – May 2016). Data was obtained on relevant clinical parameters, in addition to blood for bacterial culture and nasal washings for viral studies using an antigen detection assay (chromatographic immunoassay).

The prevalence of RSV infection among the children with ALRI was 34.2%. The peak admission for RSV-associated ALRI coincided with the peak of ALRI admissions during the rainy months. The proportion of infants among children who were RSV positive was 82.9% while the Male: Female was 1.6:1. Bacteraemia was present in 31.7% of the RSV-positive subjects. All RSV-positive ALRI subjects with bacteraemia had a diagnosis of pneumonia, none had bronchiolitis (p=0.024).

The prevalence of RSV among children with severe ALRI is high, particularly in infants. RSV-associated ALRI coincided with the peak of ALRI admissions. The present finding of high concomitant bacteraemia suggests the need for empiric use of antibiotics in RSV-ALRI with an admission diagnosis of pneumonia.
IMPLICATIONS OF THE CHANGE OF THE WHO SEVERE PNEUMONIA CASE DEFINITION ON THE EVALUATION OF PNEUMONIA INTERVENTIONS: CASE STUDIES FROM AFRICA AND THE ASIA PACIFIC

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6International Union Against Tuberculosis and Lung Disease, Child Lung Health Division, Paris, France
7Murdoch Childrens Research Institute, International Child Health, Melbourne, Australia

Background and aims

In 2013, WHO updated the 2005 definition of severe pneumonia in children so that lower chest wall indrawing ceased to be a sign requiring hospitalisation. We describe the epidemiology of severe pneumonia using the 2005 and 2013 WHO definitions, and the impact these different definitions have on pneumonia epidemiology.

Methods

Data were requested from observational hospitalised pneumonia studies in 2-23 month old children from seven sites in six countries prior to pneumococcal vaccine introduction: Fiji, Lao People’s Democratic Republic (PDR), Mongolia, Vietnam, Malawi and The Gambia. Pneumonia cases were reclassified into severe pneumonia based on the 2005 and 2013 WHO definitions. The percentage and incidence of severe pneumonia hospitalisations, according to the 2005 and 2013 WHO definition were summarised by site.

Results

There were 26,646 pneumonia hospitalisations included. The percent differences in severe pneumonia hospitalisations using the 2013 WHO severe pneumonia definition compared with the 2005 definition were: -10.9% (95%CI -14.7, -7.1%) for Fiji; -25.3% (95%CI -34.3, -16.4%) for Lao PDR; -30.0% (95%CI -26.1, -33.9%) for Mongolia; -32.1% (95%CI -43.3, -20.8%) for Hanoi Vietnam; -7.0% (95%CI -17.0, 2.6%) for Ho Chi Minh City Vietnam; -49.9% (95%CI -51.4, -48.4%) for Malawi; and -50.5% (95%CI -57.0, -44.0%) for The Gambia. This definitional change alone, reduced the incidence of severe pneumonia by 14% in Vietnam, 28% in Fiji, 39% in Mongolia, and 65% in The Gambia.

Conclusions

Hospitalised severe pneumonia will substantially decline over time, irrespective of any pneumonia intervention, if the 2013 WHO definition has been adopted during the observation period.
TIMING OF FIRST RESPIRATORY VIRUS INFECTIONS IN INFANTS IN THE FIRST 2-YEARS OF LIFE IN A COMMUNITY-BASED BIRTH COHORT.

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¹Centre for Children’s Health Research, UQ Child Health Research Centre- The School of Medicine- The University of Queensland, Brisbane, Australia
²Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia

Background and aims

Determining the timing of first infections for different respiratory viruses in young infants identifies risk periods and informs preventive interventions, including immunization strategies. We describe the ages at which 17 respiratory viruses were first detected in this birth cohort, and explore factors associated with increased odds of symptomatic primary infections.

Methods

The ORChID (Observational Research on Childhood Infectious Diseases) community-based birth cohort study recorded acute respiratory infections (ARI) in children to 2-years of age. Weekly parent-collected nose swabs from 158 infants were batch-tested by PCR for human rhinovirus (HRV), influenza A and B, respiratory syncytial virus-A and B, parainfluenza viruses 1, 2, and 3, coronaviruses OC43, NL63, 229E, and HKU1, human metapneumovirus, adenovirus, WU and KI polyomaviruses, and bocavirus-1.

Results

While the median age for first infections was 2.9-months for HRV, it was 13.9-months upwards for the other respiratory viruses. Overall, 52% of primary HRV infections were symptomatic, compared with 57-83% of other respiratory virus primary infections. Older age and the winter season were the only identifiable factors associated with symptomatic first infections.

Conclusions

Infants do not always experience respiratory symptoms following their first respiratory virus detection. Wheezing illnesses following early HRV infections are associated with later development of asthma in high-risk cohorts. Whether asymptomatic HRV infections have adverse long-term effects on some individuals warrants further study. The predominance of early HRV detections highlights implementation of early intervention, and that for many, their first infection from other respiratory viruses occurs when maternal vaccines may no longer be protective.
WSPD7-0266
EPOSTERS DECEMBER 2-5 - 09:45-17:00
PNEUMONIA AND OTHER RESPIRATORY INFECTIONS

CLINICAL CHARACTERISTICS AND DIRECT MEDICAL COST OF COMMUNITY-ACQUIRED PNEUMONIA (CAP) AMONG HOSPITALIZED CHILDREN IN SUZHOU, CHINA

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Background and aims

The intent of this study was to describe the clinical features and direct medical cost of CAP among hospitalized children in Suzhou, China.

Methods

This was a 5-year retrospective study of patients hospitalized at Soochow University Affiliated Children’s Hospital (SCH). Children who were residents of downtown Suzhou, 29 days to <15 years of age, with discharge diagnosis codes (ICD-10) including J09 to J18 and J20 to J22 were included. Medical charts and chest radiograph reports were reviewed to verify the diagnosis.

Results

Among 184734 children <15 years of age admitted to SCH from January 2010 to December 2014, 107,813 (58.4%) were residents from downtown Suzhou, and 31302 (29.0%) were enrolled as CAP. Of them, 20747 (66.3%) were <24 months old and 19205 (61.4%) were male. CAP hospitalization occurred all year round, peaked in the winter and early spring. The most frequent clinical symptom was cough, occurring in 29331 (94.4%) children, followed by fever (55.5%), wheeze (34.8%), tachypnea (8.1%), twitch (2.0), dyspnea (1.1%) and chest indrawing (0.8%). The median length of hospital stay was 8 (IQR: 7-10) days. The median cost of CAP hospitalization was RMB 4549.58 (IQR: 3568.88-5833.36). For children referred to ICU, the median hospitalization cost was RMB 9687.98 (IQR: 6966.59-16610.15). Compare with others, the children aged ≥6 months, with congenital heart disease, or low birth weight had higher hospitalization cost.

Conclusions

In Suzhou, children hospitalized for CAP have longer hospital stay compared to other countries. The direct medical cost was relatively high to average family income.
HOSPITALIZATION RATE AND POPULATION-BASED INCIDENCE OF HOSPITALIZATION FOR COMMUNITY-ACQUIRED PNEUMONIA (CAP) AMONG RESIDENT CHILDREN IN SUZHOU, CHINA

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¹Fudan University-School of Public Health, Epidemiology, Shanghai, China
²Soochow University Affiliated Children’s Hospital, Infectious Disease Department, Shanghai, China
³Pfizer, Developed Asia and Australia Medicines and Scientific Vaccines Division, Shanghai, China

Background and aims

This study aimed to estimate the hospitalization rate (HR) and population-based cumulative incidence of hospitalization (HI) due to all-cause clinical CAP (CCAP) and chest radiograph-confirmed pneumonia (RCAP) among children from downtown Suzhou, China.

Methods

This was a retrospective study of children 29 days to <15 years of age, hospitalized at Soochow University Affiliated Children’s Hospital (SCH) with discharge diagnosis codes (ICD-10) including J09 to J18 and J20 to J22. Children who were admitted for the same diseases within 30 days, and those whose medical charts were unavailable, were excluded.

Results

A total of 184734 children <15 years old admitted to SCH from January 2010 to December 2014, 31302 (29.0%) were included and identified as CCAP, and 24218 (77.4%) confirmed as RCAP. The overall HRs for CCAP and RCAP were 189 (95% CI: 187-191) and 146 (95% CI: 144-148) per 1000 hospitalizations, respectively. For children <5 years old, the HRs for CCAP was 248 (95% CI: 246-251) and RCAP 193 (95% CI: 191-196) per 1000 hospitalizations; the HIs for CCAP was 6956 (95% CI: 6893-7020) and 5432 (95% CI: 5375-5488) per 100000 children for RCAP. The highest HR and HI were both observed in children 29 days to <6 months old. For instance, among children 29 days to <6 months old, HR for CCAP was 407 (95% CI: 401-414) per 1000 hospitalizations and HI for CCAP was 11204 (95% CI: 11027-11381) per 100000 children.

Conclusions

There is a considerable burden of CAP in Suzhou children, particularly among the very young children. These data provide valuable information to monitor CAP trends over time in children of Suzhou China.
Background: Human adenoviruses (HAdVs) remains one of the major causes in pediatric respiratory tract infections in Taiwan. We recorded two waves of HAdV epidemic outbreaks in southern Taiwan during 2011 and 2014, respectively.

Methods: In this retrospective study, we compared the demographic, clinical characteristics, and risk factor for hospitalization of pediatric patients with HAdV infection in these two epidemic outbreaks. The epidemic outbreak was defined by HAdV detection rate above 7% for consecutively six weeks. HAdV infection was defined by positive HAdV isolated from respiratory tract specimens. HAdV genotype was determined by PCR-based hexon gene sequencing.

Results: The 2011 epidemic started from week 51, 2010 to week 39, 2011, while the 2014 epidemic started from week 6 to week 46, 2014. Totally, 1145 pediatric patients were identified (635 cases in 2011; 510 cases in 2014). HAdV genotype 3 and 7 contributes to both epidemics. But the proportion of HAdV3 decreased significantly (64.7% in 2011 to 25.5% in 2014, p<0.001) and replaced by other genotypes (type 1, 4, and 6) in epidemic 2014. The 2011 epidemic had a significantly higher proportion of patients diagnosed with acute gastroenterocolitis, while the 2014 epidemic had a significantly higher proportion of patients diagnosed with acute pharyngitis/pharyngoconjunctival fever (PCF) (p<0.001). Among hospitalization population, there were more patients hospitalized with the diagnosis of bronchopneumonia/or pneumonia in the epidemic 2011 (10.6% vs 5.1%, p<0.001), while more patients with the diagnosis of acute pharyngitis/pharyngoconjunctival fever (63.9% vs. 38.6%, p<0.001) in the epidemic 2014. In both epidemics, hospitalized patients had higher WBC and C-reactive protein (CRP) level than non-hospitalized patients. Using multivariate regression analysis, underlying disease and elevated C-reactive protein (CRP) level are two independent risk factors for hospitalization in both epidemics.

Conclusion: There were significant differences in clinical characteristics and risk factors of hospitalization between the 2011 and 2014 epidemics. Understanding changes in the demographics and clinical characteristics of HAdV epidemics is important from a public health perspective.
Background and aims

With a considerably expanded dataset from a large international collaboration we aimed to estimate the global incidence, hospitalisation rate and mortality from RSV-ALRI episodes in young children in 2015.

Methods

We estimated the incidence and hospitalisation rate of RSV-associated ALRI (RSV-ALRI) in children <5y from a systematic review of studies published between Jan 1995 and Dec 2016 and unpublished data from 76 high quality population-based studies. We estimated the RSV-ALRI incidence for 132 developing countries using a risk factor based model and 2015 population estimates. We estimated the in-hospital RSV-ALRI mortality by combining in-hospital CFRs with hospitalisation estimates. We also estimated overall RSV-ALRI mortality by identifying studies reporting monthly data on ALRI mortality in the community and RSV activity.

Results

We estimated that globally in 2015 there were about 33.1 (21.6-50.3) million episodes of RSV-ALRI resulting in about 3.2 (2.7-3.8) million hospitalisations, and 59600 (47000-74500) in-hospital deaths in children younger than 5 years. In children younger than six months, there were about 1.4 (1.2-1.7) million hospitalisations, and 27300 (20700-36200) in-hospital deaths due to RSV-ALRI. We also estimated that the overall RSV-ALRI mortality could be as high as 118200 (94600-149400). Incidence and mortality varied substantially from year to year in any given population.

Conclusions

Globally, RSV-ALRI is a major cause of hospital admission in young children resulting in a substantial burden on healthcare services. About 45% of hospitalisations and in-hospital deaths due to RSV-ALRI occur in children <6m.
PREVALENCE OF ACUTE RESPIRATORY INFECTIONS AND ITS RISK FACTORS IN AFGHANISTAN: A MULTILEVEL ANALYSIS

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Background and aims

According to WHO, in Afghanistan, about 25% of all under-five years child deaths in 2010 were due to pneumonia. The aim of this study is to examine the risk factors associated with acute respiratory infections (ARI) among Afghan children aged under-five years for making some recommendations to evolve the health system.

Methods

Data has been drawn from the first Afghanistan Demographic and Health Survey (AfDHS) 2015. A sum of 30,304 surviving children aged under-five years living in 956 communities has been analysed. Two-level multilevel logistic regressions have been employed to model the relationship between demographic, socioeconomic and environmental factors and ARI.

Results

About 13% children aged under-five years suffer from ARI illness. The multilevel logistic regressions revealed that the odds of having ARI have decreased and increased with increase in child age and birth order, respectively. Odds of having ARI decreased sharply with increase in mother’s education level. Further, polluting cooking fuel (OR=1.21; p<0.014) and unimproved toilet (OR=1.16; p<0.010) has higher odds of having ARI than clean fuel and improved toilet, respectively. Odds of having ARI is highest for manual women worker (OR=1.81; p<0.000) than not working women and western region (OR=2.39; p<0.000) than other regions. Besides, wealth status, ethnicity is also significant risk factor of ARI. The between-community variance in the log-odds of having ARI is estimated as 1.19 (SE 0.043).

Conclusions

Program-oriented strategies that are designed at reducing ARI illness should accept policies that cover available basic housing standards, providing non-polluting cooking fuel, increasing awareness and enhancing healthy behaviours.
A DIABETIC CHILD PRESENTED WITH NECROTIZING PNEUMONIA WHO WAS SUCCESSFULLY TREATED WITH PNEUMONECTOMY

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2Istanbul University - Istanbul Medical Faculty, Pediatric Infectious Diseases, Istanbul, Turkey
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Introduction: Diabetic patients can experience severe Staphylococcus aureus related respiratory tract infections such as necrotizing pneumonia (NP) more often. Early surgical intervention can be lifesaving in that case. Herein we report a diabetic child presented with NP who was successfully treated with pneumonectomy. Case report: A 13-year-old female with uncontrolled diabetes mellitus (DM) was admitted to pediatric intensive care unit (PICU) with diabetic ketoacidosis and respiratory distress. Her initial evaluation revealed increased acute phase reactants and diffuse pneumonic infiltration which progressed to NP within days. She was intubated and placed on mechanical ventilator (MV) support. Positive inotropes and broad spectrum antibiotics were initiated. Her blood and pleural specimen culture yielded methicillin-resistant S. aureus growth. In spite of aggressive medical treatment, infection could not be localized and initially lobectomy, then right total pneumonectomy operations were performed on 16th and 29th days of PICU admission, respectively. She gradually got better, and was weaned from MV. On 59th day, she was discharged oxygen-free from the hospital. Conclusion: Early surgical intervention should be considered for the treatment of NP resistant to medical therapy.
Background & Aims: Human rhinovirus (HRV) is the second most popular respiratory pathogen in Hong Kong, and a major aetiology for childhood wheezing illnesses. However, the relationship between HRV species and different lower respiratory tract infection (LRTI) remains controversial. This study investigated the clinical spectrum of HRV infections among hospitalised children in Hong Kong.

Methods: Nasopharyngeal aspirate (NPA) samples from patients <18 years being hospitalised for acute respiratory illnesses in Sep-Nov 2014 and Jan-Apr 2015 were retrieved. HRV was detected by RT-PCR, and isolates were sequenced to determine the genogroups. Patients’ clinical details were obtained from hospital computerised records.

Results: 90 cases with HRV and 160 controls negative for an extended panel of respiratory viruses were identified. Their mean age was 3.6 years and 3.5 years respectively. HRV infection was significantly associated with asthma exacerbation (OR 16.54, 95% CI 7.11-38.48), wheezing illnesses (OR 8.90, 95% CI 4.74-16.71) and LRTI (OR 3.53, 95% CI 2.15-5.78). Among patients with HRV and asthma exacerbations, HRV-C was more commonly found than HRV-A (75% vs 25%; OR 2.50, 95% CI 0.66-9.47). There observed a trend towards changes in HRV from HRV-C in 2014 autumn (75%) to HRV-A in 2015 spring (34.0%), the predominant genotypes in these two seasons were HRV-C-8713-MY-10 and HRV-A30/HRV-C15 respectively.

Conclusions: HRV is a risk factor for asthma exacerbation and wheezing illnesses in Hong Kong children. These disease associations may be caused by HRV-C. Predominant genotypes change with seasons and further study with greater sample size is needed to confirm these findings.
Background and aims

It is difficult to accurately diagnose mycoplasma pneumoniae pneumonia (MPP) and monitor the treatment in children. So this study aimed to evaluate the clinical value of RNA detection based test (MP-SAT) in pediatric MPP.

Methods

Total of 489 patients with pneumonia were enrolled, including 213 children with MPP and 276 other respiratory tract infection (RTI) children as controls. Sensitivity and specificity were calculated. MP-SAT and serum MP antibody positive cases were observed dynamically, the detection rates in different treatment course and clinical recovery were compared.

Results

Using the result of MP antibody as the standard, the sensitivity and specificity of MP-SAT was 77.9% (166/213) and 93.8% (259/276). The sensitivity in the short course group (≤7d) was significantly higher than that in the long course group (>7d) (P=0.006). Furtherly, 61 patients with both MP-SAT and antibody positive results were followed up. After the treatment, the positive rate of MP-SAT reduced significantly (P < 0.05), while detection rate of serum Ab increased significantly (P<0.05). The time of clinical recovery was 3.0±0.9 weeks, similar to that of SAT. Those with longer time of turning to negative had a longer fever duration, increasing neutrophil, decreasing lymphocyte, higher level CRP and LDH, and larger area of pulmonary consolidation observed on X-ray (P<0.05).

Conclusions

MP-SAT is sensitive in the early stage of MPP, and SAT can be used as an index for evaluation of the treatment outcome of MPP in children.
PATHOGENIC ANALYSIS OF BRONCHOALVEOLAR LAVAGE FLUID IN 507 CHILDREN WITH ACUTE LOWER RESPIRATORY TRACT INFECTION

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²The First Affiliated Hospital of Kunming Medical University, Pediatrics, Kunming, China

Background and aims

To understand the pathogens distribution and clinical epidemiological characteristics of acute lower respiratory tract infection (ALRTI) in this region, and to provide evidence for clinical initial anti-infection treatment.

Methods

507 hospitalized children with ALRTI were examined by the electronic bronchoscopy in the Children’s Hospital Affiliated to Kunming Medical University from March, 2016 to February, 2017. BALF was collected and used to detect the pathogens.

Results

294 of 507 children with ALRTI were with positive pathogens. 59 (11.6%) cases were pure bacteria. 62 (12.2%) cases were pure virus. 131 (25.8%) cases were pure MP. 4 (0.8%) cases were pure TB. 38 (7.5%) cases were mixed infection of multiple pathogens.

Conclusions

The pathogens in children with ALRTI were mainly bacteria, viruses and MP. The detection rate from high to low was MP, virus and bacteria. SP infection was more common in children with bacterial infection. RSV infection was more common in children with virus infection. MP combined with virus infection was more common in children with multiple pathogens mixed infection. The positive rate of bacteria and virus were higher in infancy than that in other age groups, the positive rate of MP was higher in school age than that in other age groups. There were no difference in detection rate of bacteria, virus and multiple pathogens mixed infection among seasons, the detection rate of MP was high in winter. The detection rate of bacteria, MP and multiple pathogens mixed infection were higher in male than in female children, there was no difference in detection rate of virus between male and female children. TB infection in ALRTI children are rare.
THE RELATIONSHIP BETWEEN EFFUSION AND LABORATORY MARKERS IN PATIENTS WITH PARAPNEUMONIC EFFUSION

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¹Gazi University Faculty of Medicine, Pediatric Infectious Disease, Ankara, Turkey
²Ankara, Turkey

Background and aims

Thrombocytosis is known to be an inflammatory marker in community acquired pneumonia (CAP). This study aims to evaluate the relationship between laboratory markers [thrombocyte count (TC), mean platelet volume (MPV)] and parapneumonic effusion.

Methods

41 patients hospitalised in Gazi University, Department of Pediatrics with the diagnosis of parapneumonic effusion between 2010-2017 were included. The relationship between TC, leukocyte count, C-reactive protein (CRP), MPV levels of patients and quantity of effusion fluid and fibrinolytic treatment (FT) was evaluated.

Results

The number of patients with parapneumonic effusion was 41. Eighteen (43,9%) of patients needed FT (4streptokinase, 13urokinase, 1alteplase). Leukocyte count and CRP values on the day of hospitalisation of patients who were given FT were higher than patients who weren't. Difference between TC of these groups on the day of hospitalisation was not statistically significant. Patients who were given FT had higher TC on the day of discharge than patients who weren’t (p< 0,05). The peak value of TC was between 6-10th days. This peak value was independent from the fibrinolytic agent. Hospitalisation of patients whose effusion was more than 1 cm was longer than patients who had <1 cm effusion (p<0,05)

Table 1. Descriptive statistics of patients with parapneumonic effusion

<table>
<thead>
<tr>
<th>Parameter</th>
<th>n</th>
<th>median</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalisation period (day)</td>
<td>41</td>
<td>14</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Age (month)</td>
<td>41</td>
<td>72</td>
<td>2,5</td>
<td>192</td>
</tr>
<tr>
<td>CRP on hospitalisation day (gr/L)</td>
<td>37</td>
<td>130</td>
<td>2</td>
<td>480</td>
</tr>
<tr>
<td>Leukocyte count on hospitalisation day/mm³</td>
<td>37</td>
<td>15900</td>
<td>6460</td>
<td>33590</td>
</tr>
<tr>
<td>Thrombocyte count on hospitalisation day/mm³</td>
<td>39</td>
<td>381100</td>
<td>14200</td>
<td>1038000</td>
</tr>
<tr>
<td>MPV on hospitalisation day</td>
<td>39</td>
<td>7.4</td>
<td>5.92</td>
<td>9.80</td>
</tr>
<tr>
<td>Thrombocyte count on the day of discharge/mm³</td>
<td>37</td>
<td>556900</td>
<td>221900</td>
<td>881800</td>
</tr>
<tr>
<td>MPV on the day of discharge /mm³</td>
<td>37</td>
<td>6.7</td>
<td>5.37</td>
<td>10.90</td>
</tr>
</tbody>
</table>
Conclusions

The reason of higher CRP and leukocyte counts in patients who were given FT may be the severity of inflammation in the acute phase of disease in those patients. The higher TC on the day of discharge in patients who were given FT may be due to effect of FT itself or exaggerated late inflammatory response to infection.
Background and aims

Influenza virus is a common respiratory virus which is responsible of important mortality and morbidity. Each strain or subtype of influenza virus show variability in geographic distribution and also in clinical presentation. This study aims to evaluate the distribution of strains of influenza virus in season 2015-2016 and to determine the clinical outcome.

Methods

Pediatric patients who were hospitalized with at least one of influenza associated symptoms in Gazi University Medical Hospital between 1 October 2015-1 April 2016 were included. Nasopharyngeal swab sampling was done and respiratory viruses were identified with viral multiplex PCR. Symptoms, physical examination findings, complications were investigated for each influenza strain.

Results

30 of total 212 (14.1%) patients were influenza positive. Descriptive statistics of patients are shown in table 1. The difference between laboratory parameters of different strains were not statistically significant. 3 (10%) of patients with influenza, were transferred to intensive care unit. 21 (70%) of patients had influenza related complications, and the most common complication was pneumonia (53,3%). A complication occurred in 8 of 9 (88,9%) patients with H3N2 and 10 of 13 patients with H1N1 (76,9%) had a complication, this difference was statistically significant (table 2). The difference between strains was not statistically significant when each complication was evaluated individually (table 2)
**Table 1. Descriptive statistics of patients with influenza**

<table>
<thead>
<tr>
<th></th>
<th>H1N1</th>
<th>H3N2</th>
<th>influenza B</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>13</td>
<td>9</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Age (months)</td>
<td>Median</td>
<td>36 (1-180)</td>
<td>11 (3-78)</td>
<td>24 (6-46)</td>
</tr>
<tr>
<td></td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of</td>
<td>Median</td>
<td>7 (1-19)</td>
<td>5 (2-34)</td>
<td>6 (4-17)</td>
</tr>
<tr>
<td>hospitalisation (day)</td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of</td>
<td>Median</td>
<td>3 (0-10)</td>
<td>4 (0-9)</td>
<td>6 (5-7)</td>
</tr>
<tr>
<td>fever (day)</td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukocyte count</td>
<td>Median</td>
<td>7103 (2939-16060)</td>
<td>9408 (2405-1890)</td>
<td>8417 (6155-20332)</td>
</tr>
<tr>
<td>(mm$^3$)</td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-Reactive Protein</td>
<td>Median</td>
<td>10,6 (1,95-127)</td>
<td>12 (1-79,3)</td>
<td>13 (4-14)</td>
</tr>
<tr>
<td>(mg/L)</td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatin Kinase</td>
<td>Median</td>
<td>625,5 (96-10095)</td>
<td>261 (77-519)</td>
<td>-</td>
</tr>
<tr>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absolute neutrophil count</td>
<td>Median</td>
<td>3457 (962-7000)</td>
<td>4080 (790-10845)</td>
<td>6240 (3718-10477)</td>
</tr>
<tr>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alanine</td>
<td>Median</td>
<td>30 (15-102)</td>
<td>23 (5-82)</td>
<td>55,5 (12-99)</td>
</tr>
<tr>
<td>transaminase</td>
<td>(min-max)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Complications and Virus Strain**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>H1N1 (n,% )</th>
<th>H3N2 (n,% )</th>
<th>influenza B (n,% )</th>
<th>Other (n,% )</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>30</td>
<td>13 (76,9%)</td>
<td>9 (88,9%)</td>
<td>3 (20%)</td>
<td>5 (20%)</td>
<td></td>
</tr>
<tr>
<td>overall</td>
<td>21</td>
<td>10 (76,9%)</td>
<td>8 (88,9%)</td>
<td>2 (66,6%)</td>
<td>1 (20%)</td>
<td>0.04</td>
</tr>
<tr>
<td>complication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pneumonia</td>
<td>16</td>
<td>7 (53,8%)</td>
<td>6 (66,6%)</td>
<td>2 (66,6%)</td>
<td>1 (20%)</td>
<td>0.36</td>
</tr>
<tr>
<td>otitis</td>
<td>1</td>
<td>1 (7,6%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.66</td>
</tr>
<tr>
<td>myocarditis</td>
<td>1</td>
<td>0 (0%)</td>
<td>1 (11,1%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.66</td>
</tr>
<tr>
<td>myositis</td>
<td>3</td>
<td>2 (15,3%)</td>
<td>1 (11,1%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.85</td>
</tr>
<tr>
<td>encephalitis</td>
<td>2</td>
<td>1 (7,6%)</td>
<td>1 (11,1%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*Column percentage is used*

**Conclusions**

Geographic distribution of influenza strains and their clinical outcomes are important.
METHAPNEUMONIC PLEURISY – A DISTINCT CLINICAL ENTITY

V. Tatochenko

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Background and aims

Pleural effusions that accompany CAP (mostly caused by S. pneumoniae) are usually described as one clinical entity in most articles, textbooks and guidelines. We intend to show that there are two types of pleural complications that have different origin and require different management.

Methods

Clinical observation (over 100 cases in the last 30 years), therapy modification, follow-up.

Results

Pleurisies that accompany CAP from its inception (synpneumonic - SPP), are of bacterial origin with purulent (or quickly becoming purulent) effusion and WBC of 2 000-10 000/mm³, pH <7.3, glucose <2.5 mmol/L. SPP responds to antimicrobials and, with inadequate treatment tend to become chronic (empyema), requiring surgery.

Quite distinct are pleurisies that appear after the start of antimicrobial therapy (methapneumonic - MPP). They usually complicate necrotizing pneumonia with or without synpneumonic effusion. Pleural exudate in MPP is serofibrinous with a low WBC (<1000/mm³), high pH (7.35-7.8) and glucose (≥3.5 mmol/L), and a very high ESR. MPP is accompanied by a prolonged fever that does not respond to antibiotics but plummets on steroids. These features, as well as a massive increase of circulating immune complexes with complement consumption suggest a immunopathological nature of MPP. MPP has a good prognosis: as shown by follow-up, a 3 days’ course of steroids without any intrapleural interventions gives excellent results.

Conclusions

Recognition of methapneumonic pleurisy allows to modify treatment modalities currently recommended for all pleurisies complicating iCAP.
DETERMINANTS OF MORTALITY AND PROLONGED HOSPITALISATION IN CHILDREN WITH ACUTE LOWER RESPIRATORY INFECTION AT THE NATIONAL HOSPITAL ABUJA, NIGERIA

C. Ulonnam¹, P. Ahmed¹, I. Babaniyi¹, D. Shatima¹
¹National Hospital Abuja, Pediatrics, Abuja, Nigeria

Background and aims

Background. Acute lower respiratory tract infections (ALRTIs), are significant contributors to under-5s morbidity and mortality. Socio-demographic and clinical factors predict outcome hence early identification and appropriate intervention may improve survival.

Aim: To determine factors that predicts ALRTI mortality and prolong hospitalisation.

Methods

Prospective, descriptive, hospital based study, over a 6months period among children aged 2 -59 months diagnosed of ALRTI based on clinical features, laboratory and radiological investigations. Prolonged hospital stay was define as longer than five days.

Results

589 children aged 2-59 months were admitted during the study period, 125(21.2%) had ALRTI; { pneumonia 102 (81.6%), bronchiolitis 13(10.4%) and acute laryngo-tracheo-bronchitis 10 (8.0%)}. Mean age ± SD was 13.4 ± 13.7 months; children 2-12 months were 82 (65.6%); mean duration hospital stay was 7 ± 2.66 days. 44(37.9%) had prolonged hospital stay, 116(92.8%) discharged and 9 died; case fatality 7.2%.

Predictors of prolonged hospitalisation included head nodding (OR:100.52, p=0.005), heart failure (OR: 93.56, p=0.022), grunting (OR: 58.68, p=0.013), inability to suck or feed (OR: 24.31, p=0.039), inbuilt kitchen type (OR 22.96; p=0.026), severe malnutrition (OR; 18.43, p=0.003), and hypoxemia (OR; 9.99, p=0.006). Predictors of mortality were; severe undernutrition (OR, 1863.58, p=0.004), cyanosis (OR 563.51, p=0.037), hypoxemia (OR; 168.68, p=0.012), dehydration (128.58, p=0.011), lethargy (OR; 96.32, p=0.042) and grunting (OR; 77.44, p=0.032).

Conclusions

Factors that contributed to outcome in ALRTIs were mainly grunting, severe malnutrition and hypoxaemia.
SURVEILLANCE FOR INFLUENZA A VIRUS INFECTIONS IN CHILDREN FROM 2004 TO 2016 IN BEIJING

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¹Capital Institute of Pediatrics, Department of Virology, Beijing, China

Background and aims

To investigate the epidemic trend of influenza A virus infections in children in Beijing

Methods

Throat swabs were collected from children with influenza-like illness visiting Department of outpatient and emergency from 2004 to 2016 and were inoculated into MDCK cells and identified by HI assay.

Results

1. Eight hundred and seventy-four influenza A viruses were isolated from 9768 throat swab specimens, including 70 seasonal H1N1, 237 H1N1pdm and 567 H3N2. 2. Each of the surveillance season from 2004 to 2009 (except 2007-2008), the H1N1pdm led an epidemic peak, especially in 2004-2005 and 2005-2006 seasons with high monthly positive rate. 3. The appearance of H1N1pdm completely replaced the seasonal H1N1 subtype in 2009; from 2009 to 2016, H1N1pdm prevailed two consecutive seasons every other year. 4. The positive rate of Influenza A increased with age of children; the number of children in 6-12 year-old age-group infected with influenza B was much higher than that of influenza A virus, while the positive number of influenza A was much higher than that of B in children younger than 3 and older than 12 year-old age-group. 5. The positive rates of influenza A in six seasons were higher than that of influenza B; the epidemic peak of influenza A in nine seasons appeared earlier than that of influenza B.

Conclusions

From September 2004 to June 2016, the epidemic of influenza A viruses emerged every 2 or 3 consecutive seasons in children in Beijing and the positive rate of influenza A viruses was increased with age of children.
REGULATED THE MANAGEMENT OF THE ATOMIZATION ROOM FOR IMPROVING THE COMPLIANCE OF INFANT INHALATION TREATMENT

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Background and aims

To explore the effect of regulating the management of atomization centers on improving the compliance of infant inhalation treatment.

Methods

1648 children from 6 months to 3 years of inhalation treatment randomly divided into control group of 835 and experimental group of 813. The control group received traditional atomization pump atomization treatment, the experimental group received atomization treatment using the patented “multi-function atomizer”, and the environment and process optimization in the new moving atomization room. We surveyed inhalation treatment compliance and satisfaction using self-designed questionnaire. The differences in the compliance and parent's satisfaction of the two groups were compared.

Results

Comparison of patient questionnaire of the old and new atomization room in the same period, we found that the inhalation compliance and parent's satisfaction has improved significantly in the new modified layout atomization room enabled patented “multi-function atomizer” and optimized the process. The compliance rate was 42% increased to 88.3%, environmental comfort satisfaction increased by 10.5%, facility convenience satisfaction 6.8%, health education satisfaction 4.5%, the difference was statistically significant (P<0.01).

Conclusions

Through the demolition of the layout process optimization of the atomization chamber, and the use of patented “multi-function atomizer” to significantly improve the compliance of infants inhalation treatment and parental satisfaction.
INHIBITION OF HIF-1α BY OXYMATRINE ATTENUATES ENDOTOXIN-INDUCED LUNG INJURY/ACUTE RESPIRATORY DISTRESS SYNDROME

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Background and aims

We asked whether the protective effects of oxymatrine on lipopolysaccharide (LPS) -induced acute lung injury (ALI)/acute respiratory distress syndrome (ARDS) in mice was related to its depression on LPS-induced HIF-1α expression, which in turn reduced the production of pro-inflammatory mediators.

Methods

Lung injury was induced by intraperitoneal administration of LPS in mice. Bronchoalveolar lavage fluid (BALF) LDH content, total cell and neutrophil counts in BALF, and histological changes were measured. TNF-α, IL-6, and IL-1β in serum, BALF and macrophage supernatant were also assessed by ELISA. HIF-1α protein level in lungs and cultured macrophages were detected by western blotting. Furthermore, HIF-1α mRNA level, and HIF-1α protein synthesis related proteins and its degradation were observed by real-time RT-PCR and western blotting, respectively.

Results

Improvements in BALF LDH content, total cell and neutrophil counts in BALF, and histological changes were seen in oxymatrine pretreatment mice. Oxymatrine administration also attenuated the production of TNF-α, IL-6, and IL-1β in serum, BALF and macrophage supernatant. LPS induced HIF-1α expression in a dose- and time-dependent manner, but oxymatrine concentration-dependently reduced LPS-induced HIF-1α expression in macrophages. Pretreatment of oxymatrine did not affect LPS-induced HIF-1α mRNA expression, but inhibited the activation of AKT and MAPK pathways and the phosphorylation of protein translational apparatus, including p70S6K1, S6 ribosomal protein, 4E-BP1, and eIF4E, and promoted HIF-1α protein degradation via the proteasomal pathway in LPS-stimulated macrophages.

Conclusions

Our current study showed that oxymatrine significantly attenuated LPS-induced ALI/ARDS in mice and reduced the production of inflammatory cytokines both in vivo and in vitro, which was correlated with its depression on LPS-induced HIF-1α expression.
DEVELOPMENT OF INDICATORS FOR ASSESSING RATIONAL DRUG USE TO TREAT PEDIATRIC COMMUNITY-ACQUIRED PNEUMONIA IN HOSPITALS AND CLINICS: A MODIFIED DELPHI STUDY

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Background and aims

Community-acquired pneumonia is a common infectious disease in children and an important cause of hospital admission. However, more than 50% of medicines are prescribed, dispensed, or sold inappropriately, while 50% of children fail to take them correctly. The objective of this study was to develop a set of indicators to assess rational drug use (RDU) to treat pediatric community-acquired pneumonia (CAP) in hospitals (including community hospitals) and clinics.

Methods

Initial indicators were generated based on a systematic review of guidelines and studies; then, a three-round modified Delphi process was carried out, 24 experts across China, comprising 12 clinicians and 12 clinical pharmacists were invited to participate in the Delphi process. An analytic hierarchy process (AHP) was applied to determine the weight of each indicator.

Results

A consensus was reached after three rounds of the Delphi survey. Three first-rank indicators and twenty-seven second-rank indicators were developed, and each indicator was weighted. The first-rank indicators comprised drug choice, drug usage and dosage, and the duration of drug therapy; Among the second-rank indicators, 18 (66.7%) indicators were developed to evaluate antibiotic use, while 4 (14.8%) were developed to evaluate antiviral agents, 1 (3.7%) to evaluate traditional Chinese medicines and 4 (14.8%) to evaluate adjuvant drugs.

Conclusions

The developed indicator set is the first set that is intended to assess rational drug use to treat pediatric community-acquired pneumonia in hospitals (including community hospitals) and clinics and constitutes a methodological reference for the development of other indicator sets. The utility of this indicator set will be tested in further clinical practice.
POLYMORPHISMS OF ASTHMA SUSCEPTIBILITY GENE HLA-DQ AND ORMDL3 IN INFANTILE WHEEZING

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Background and aims

Discussing the polymorphisms and interactions of asthma susceptibility gene HLA-DQA1, HLA-DQA2 and ORMDL3 in infantile wheezing to provide a theoretical basis for early diagnosis of asthma.

Methods

150 wheezing infants visiting the Shandong Provincial Hospital from October 2015 to November 2016 were recruited and divided into two groups, asthma predictive index (API) positive (n=80) or negative (n=70) groups. Juno system with the 96.96IFC were applied to detect the genotypes of four SNPs in childhood asthma susceptibility gene HLA-DQA1, HLA-DQA2 and ORMDL3. The genotype distributions were analyzed and compared between the two groups, and the interactions among the asthma susceptibility genes were discussed by GMDR.

Results

(1) There were no significant differences found in the genotype distribution of rs9272346 between the two groups (P > 0.05). (2) The frequencies of rs7773955 CC homozygotes in the API positive group were significantly higher than those in the API negative group, and the frequencies of TT homozygotes in the API negative group were significantly higher than those in the API positive group. (3) The frequencies of AG heterozygotes in the API positive group were significantly higher than those in the API negative group, and the frequencies of GG homozygotes in the API negative group were significantly higher than those in the API positive group.

Conclusions

(1) In the API positive group, the frequencies of childhood asthma susceptibility gene HLA-DQA2 SNP rs7773955 CC homozygotes, ORMDL3 SNPs rs4794820 AG heterozygotes and rs7216389 TC heterozygotes were significantly higher, which were the high risk genotypes of infant wheezing. (2) There was a positive interaction which synergistically enhances the risk of API positive infantile wheezing and the persistent asthma.
THE VALUE OF NEUTROPHIL TO LYMPHOCYTE COUNT RATIO IN INFANTS WITH SEvere PNEUMONIA

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Background and aims

Our aim in this study is to evaluate the effect of the neutrophil to lymphocyte count ratio (NLR) on severe pneumonia in infants.

Methods

This study was planned as a prospective study. Infants who suffered from severe pneumonia and were admitted in Pediatric Intensive Care Unit (PICU) in our hospital from June 2012 to December 2014 were involved in this study. Demographic characteristics, white blood cell count (WBC), neutrophil (Neu), lymphocyte (Lym) and NLR values were recorded upon PICU admission.

Results

The extremely critical group were highest incidence rate in the youngest infants, while the hospitalization time is longest in critically ill group (Z=61.88, P=0.002). The number of WBC and Neu in extremely critical group were more than other two groups (separately, F=14.233, P=0.045; F=32.842, P=0.041). There were no significant differences in the number of Lym among there groups. The levels of NLR in critically ill group and extremely critical groups were higher than non-critical group (F=81.030, P=0.017), separately 2.09±1.17, 2.16±1.84, and 1.38±1.17. After 10 days treatment, according to the prognosis, the patients were divided into 2 groups, the disease improved group (188 patients) and the deterioration group (36 patients). The average of age and PICS were lower in deterioration group than improved group (separately, F=15.941, P=0.008; F=19.111, P=0.004). There were no significant differences in the number of WBC, Neu and Lym between these two groups. The level of NLR was higher in deterioration group (2.24±2.16) than improved group (1.46±1.21) (t=1.584, P=0.011).

Conclusions

The extremely critical group and the poor outcomes were highest incidence rate in the youngest infants. The analysis of NLR is beneficial in judging patients’ condition and assessing prognosis of infants with severe pneumonia.
THE SIGNIFICANCE AND FUNCTIONAL ANALYSIS OF NOTCH LIGAND DLL4 EXPRESSION IN THE PERIPHERAL BLOOD OF CHILDREN WITH MYCOPIASMA PNEUMONIAE PNEUMONIA

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Background and aims

To understand the role of the Notch signaling pathway in the pathogenesis of Mycopiasma Pneumoniae Pneumonia.

Methods

128 hospitalized MPP children were enrolled from March 2015 to July 2016 in Children’s Hospital of Soochow University, including 76 mild cases and 52 severe cases. Forty hospitalized children for surgical elective surgery as control group. To detect the expression of Jagged1, Jagged2, DLL1 and DLL4 in children with MPP by using RT-PCR methods. Flow Cytometric detection of peripheral blood CD cell proportion of lymphocytes. Serum levels of IFN-γ, IL-10 and IL-17 were detected by ELISA.

Results

The levels of mRNA of Notch ligands DLL4 were significantly higher than those in the control group (P<0.05). The levels of mRNA of Notch ligands DLL1 and DLL4 of severe group were significantly higher than those in the mild group (P<0.05). The levels of CD3+ and CD3+CD4+ cells in the MPP group were substantially lower than those in the control group (P< 0.05). The levels of IFN-γ and IL-17 in the severe MPP group were higher than those in mild MPP group (P<0.05). The expression of Notch ligand DLL4 of the MPP group correlated negatively with the levels of peripheral CD3+(r=-0.199, P=0.024) and CD3+CD4+(r=-0.276, P=0.002). The levels of IFN-γ and IL-17(r=0.176, P=0.047, r=0.194, P=0.028).

Conclusions

The Notch ligand DLL4 may be involved in the pathogenesis of MPP and related to the severity. DLL4 play an important role in post-infectious inflammation of MPP mainly through regulating Th1 and Th17 cell-mediated immune responses.
IN YOUNG CHILDREN, PERSISTENT WHEEZING IS ASSOCIATED WITH MYCOPLASMA PNEUMONIA INFECTION

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Background and aims

We aim to discuss the status of Mycoplasma pneumonia (MP) in persistent wheezing children and the characteristics of airway inflammation in these children.

Methods

40 persistent wheezing infants with poor responding to inhaled corticosteroid (ICS) therapy, was enrolled in the study. All of them underwent flexible bronchoscopy with bronchoalveolar lavage (BAL). Cell morphology analysis was using Wright-Giemsa staining. Pathogens were tested in BAL-Fluid and patients’ clinical data were recorded.

Results

40 children aged from 4 to 30 months with persistent wheezing for at least four weeks were enrolled in our study. 9 (22.5%) of them were detected with airway malformation. MP was found as the most predominant microorganism, which was detected as a sole pathogen in 10 of these 40 infants (25.0%). Significant bacterial cultures (>10⁴ cfu/ml) were found in 10 of 40 (25.0 %) children, with Haemophilus influenza being the highest (12.5%). The titer of MP detected and airway malformation had no significant correlation with the severity of airway neutrophilic inflammation (P=0.536 and 0.248, respectively). Almost all children (92.3%) had clinical resolution after using azithromycin for 2-3 weeks.

Conclusions

MP was the most predominant microbiological found in persistent wheezing infants. Persistent wheezing children had neutrophilic inflammation in BAL-fluid. Macrolides antibiotic treatment may help ease clinical symptoms of these patients.
EXCESSIVE INFLAMMATION IN THE BRONCHOALVEOLAR LAVAGE FLUID OF REFRACTORY MYCOPLASMA PNEUMONIAE PNEUMONIA IN HOSPITALIZED CHILDREN
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Background and aims
This study is aim to explore the excessive inflammation in patients with refractory Mycoplasma pneumoniae pneumonia (RMPP) and the role of costimulatory molecule B7-H3.

Methods
Forty-three children with RMPP diagnosed by PCR were admitted to Children's Hospital of Soochow University. These children were enrolled and evaluated from October 2013 through September 2014. Fifteen children with bronchial foreign body were chosen as control group. Fiberoptic bronchoscopy (FB) was underwent and bronchoalveolar lavage fluid (BALF) was collected.

Results
The level of sB7-H3, TNF-α, IFN-γ, GM-CSF, IL-1β and IL-8 in BALF was measured by ELISA. The concentrations of TNF-α (114.92 ± 21.88 pg/ml), IFN-γ (82.20 ± 69.24 pg/ml), GM-CSF (152.50 ± 35.51 pg/ml), IL-1β (32.14 ± 9.11 pg/ml) and IL-8 (152.50 ± 35.51 pg/ml) in BALF were significantly higher in children with RMPP compared to children in control group (P<0.05), and was down-regulated after treatment. The level of sB7-H3 had a positively correlation with IL-1β and GM-CSF (r=0.785, r=0.760, both P<0.001).

Conclusions
Excessive inflammation was found in BALF of children with RMPP. B7-H3 may play an important role in children with RMPP, especially for increasing IL-1β and GM-CSF, leading to a severe immuno-inflammatory response. The level of sB7-H3 in BALF might predict the outcome of RMPP.
PEDiatric CLINICal FEATURES OF MycoplAsMA pneumonIae Infection ARE ASSOCIATED WITH BACTERIAL P1 GENOTYPE
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Background and aims

The present study evaluated the association between different Mycoplasma pneumoniae (M. pneumoniae) genotypes and clinical features of pediatric patients.

Methods

Subjects were children diagnosed with community-acquired pneumonia at the Children’s Hospital of Soochow University (Suzhou, China) from January 2012 to December 2013. Clinical and laboratory tests were conducted and clinical samples positive for M. pneumoniae were genotyped by nested-multiplex polymerase chain reaction. Three type I strains and three type II strains were also randomly selected for sequencing. A total of 335 clinical samples positive for M. pneumoniae were obtained.

Results

The average age of M. pneumoniae-infected pediatric patients was 4.8±3.3 (years). Genotyping results identified 304 positive samples as group I strains and 30 samples as group II strains, in which 1 sample was type II variant 2a. It was also observed that point mutations were more likely to occur in type I strains compared with type II strains. Although clinical pulmonary infection scores between patients with type I and type II strains did not significantly differ, patients with type I strains had a higher risk of developing severe M. pneumoniae pneumonia (SMPP) and extrapulmonary complications, and had significantly higher percentages of peripheral blood neutrophils than patients with type II strains (P<0.05).

Conclusions

Collectively, these data indicate that the predominant strains of M. pneumoniae in Suzhou between 2012 and 2013 were type I, and that pediatric pneumonia patients with type I strains of M. pneumoniae were more likely to progress to SMPP.
The Role of mir-29c/B7-H3/Th17 Axis in Children with Mycoplasma Pneumoniae Pneumonia

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Background and aims

This study aimed to reveal the role and clinical significance of mir-29c/b7-h3 / Th17 axis in children with MPP.

Methods

Total of 52 children with MPP were and 26 controls enrolled. The miR-29c expression in monocytes of children with MPP was determined by real-time PCR and soluble B7-H3 (sB7-H3) and IL-17 was determined by ELISA. The levels of transcription factor ROR-γt and cytokine IL-17A in CD4⁺CD45RA⁺ T cells were detected after stimulated by different concentrations of B7-H3 fusion protein in vitro.

Results

Children with MPP had significantly lower level of miR-29c and higher level of sB7-H3 and IL-17 compared to controls (both P < 0.05). The level of miR-29c significantly increased during convalescent phase compared to that of acute phase while sB7-H3 and IL-17 significantly decreased during convalescent phase (both P < 0.05). There was a positive correlation between the levels of sB7-H3 and IL-17 in acute-stage of MPP (r = 0.361, P = 0.009). Children with MPP combined with pleural effusion had significantly higher level of sB7-H3 compared to those without pleural effusion (9952.3 ± 3065.3 vs. 7449.7 ± 2231.5, pg/ml). The levels of sB7-H3 was positively correlated with days of fever while the level of miR-29c was negatively correlated with the M. pneumoniae specific IgG and IgM level.

Conclusions

The axis of miR-29c/B7-H3/Th17 plays vital role in children with MPP through immuno-inflammatory lesions. miR-29c and B7-H3 maybe the new target for the prevention and treatment of MPP,and maybe the novel and potential biomarkers for the assessment of prognosis.
THE ROLE OF GRANULOCYTE MACROPHAGE COLONY STIMULATING FACTOR IN HOSPITALIZED CHILDREN WITH MYCOPLASMA PNEUMONIAE PNEUMONIA

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Background and aims

Inappropriate inflammatory response in children with Mycoplasma pneumoniae (M. pneumoniae) infection might be associated with disease severity. The role of GM-CSF in hospitalized children with M. pneumoniae pneumonia (MPP) has not been fully discussed.

Methods

Clinical and laboratory data of a total 40 children with MPP were collected. Granulocyte macrophage colony stimulating factor (GM-CSF) and myeloperoxidase (MPO) were detected by ELISAs. Meanwhile, normal human bronchial epithelium was infected by M. pneumoniae and neutrophils were stimulated by GM-CSF to explore GM-CSF and MPO release in supernatant, respectively.

Results

Compared to control group, a significant increased percentage of neutrophils and decreased percentage of macrophages in bronchoalveolar lavage fluid of children with MPP was observed (P < 0.05). Children with MPP had significantly higher levels of GM-CSF (P = 0.0047) and MPO (P = 0.0002) in BALF compared to the controls. Level of GM-CSF in BALF was associated with duration of fever (r = 0.42, P = 0.007) and strongly correlated with level of MPO (r = 0.075, P = 0.0005). Levels of GM-CSF and MPO significantly decreased (both P < 0.05) after treatment. In vitro, M. pneumoniae induced GM-CSF expression in a time-dependent manner during a 72-h period (P < 0.05) and MPO secretion significantly increased by recombinant human GM-CSF stimulation at 24h (P < 0.05).

Conclusions

GM-CSF could be induced by M. pneumoniae infection in vivo and vitro. Children with high level GM-CSF had longer duration of fever. GM-CSF probably plays a vital role in neutrophil inflammation in M. pneumoniae infection.
ROLE OF PRECEDING VIRAL OR MYCOPLASMA PNEUMONIAE INFECTION IN INVASIVE BACTERIAL DISEASES IN CHINESE CHILDREN

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Background and aims

Invasive bacterial disease, which could result from bacterial colonization, continues to be a major cause of morbidity and mortality in children worldwide. The aim of this study is to analyze the correlations between preceding viral or Mycoplasma pneumoniae infections and bacterial colonization and invasive bacterial diseases in China.

Methods

From January 2006 to December 2013, nasopharyngeal aspirate samples were obtained from children admitted to Children's Hospital of Suzhou University. Common pathogens and bacterial colonization were detected using direct immunofluorescence, polymerase chain reactions, and bacterial culture. During the same period, cases with culture-confirmed invasive bacterial diseases were collected. Correlations between preceding viral or Mycoplasma pneumoniae infections, bacterial colonization, and invasive bacterial disease were analyzed.

Results

Mycoplasma pneumoniae (24.9%) was the most common respiratory pathogen, followed by respiratory syncytial virus (15.7%) and human bocavirus (7.1%). Meanwhile, the most common bacterial colonizations were Streptococcus pneumoniae (12.7%), Haemophilus influenzae (4.9%), and Moraxella catarrhalis (3.7%). Septicemia was one of the most common invasive bacterial diseases. Human bocavirus was correlated with Streptococcus pneumoniae; influenza virus B, parainfluenza virus 3, and adenovirus were correlated with Haemophilus influenzae; and Mycoplasma pneumoniae was correlated with Moraxella catarrhalis. However, only respiratory syncytial virus and Streptococcus pneumonia were correlated with invasive bacterial disease. There were strong correlations between preceding viral or Mycoplasma pneumoniae infection, bacterial colonization, and invasive bacterial disease.

Conclusions

Prevention of virus or Mycoplasma pneumoniae infection may ultimately be an important strategy to control invasive bacterial disease.
ANALYSIS OF TREATMENT FACTORS OF OCCURRENCE OF BRONCHITIS OBLITERANS IN CHILDREN WITH MYCOPLASMA PNEUMONIAE PNEUMONIA

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Background and aims

To analyze the associated treatment factors of occurrence of bronchitis obliterans in children with Mycoplasma pneumoniae pneumonia (MPP) and atelectasis.

Methods

104 Hospitalized patients with MPP and atelectasis were enrolled from June 1, 2012 to January 1, 2014 in Beijing Children’s hospital. The patients were divided into two groups, with bronchitis obliterans and without bronchitis obliterans. Including the start time and the period of treatment with azithromycin, the application and the start time of treatment with glucocorticoid, the using time and the initial dose of methylprednisolone, the application of Human Immunoglobulin, and the application and start time and times of bronchoscopic lavage, were performed preliminary screening by univariate analysis.

Results

104 cases were followed up, from six months to two years, and 23 cases with bronchitis obliterans, 10 cases with bronchitis obliterans and bronchiectasis. Mono-factorial analysis showed that seven variables were found with statistical significance including the start time and the period of treatment with azithromycin, and the application and using time of glucocorticoid, and the application and the start time and times of bronchoscopic lavage (the chi-square values were 18.326、4.715、12.141、5.362、5.649、16.328、12.832 respectively, P values were 0.000、0.030、0.001、0.021、0.034、0.000、0.000 respectively). Then non-conditional logistic analysis of the seven significant variables showed that the start time of treatment with glucocorticoid, and the start time and times of bronchoscopic lavage were statistically significant (OR values were 12.658、7.626、10.310 respectively, P values were 0.034、0.007、0.002 respectively).

Conclusions

The start time of treatment with glucocorticoid and bronchial lavage were correlative factors of occurrence of bronchitis obliterans in children with Mycoplasma pneumoniae pneumonia (MPP) and atelectasis.
USE AND SAFETY OF AZITHROMYCIN FOR LOWER RESPIRATORY TRACT INFECTIONS IN CHILDREN
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Background and aims

Azithromycin is often used in children with lower respiratory tract infection. However, currently, the efficacy and safety of the drug are still unclear in children under the age of 16 because of lack of pharmacokinetic studies. Our objective was to evaluate the efficacy and safety of azithromycin in the treatment of lower respiratory tract infection in children.

Methods

Blood samples were collected from children treated with azithromycin were quantified by high-pressure liquid chromatography–mass spectrometry.

Results

A total of 152 measurements with high-pressure liquid chromatography were performed during the year of 2014 to 2016 in different patients. A large variability in azithromycin trough blood levels was observed in 142 children who were treated in the same dose, ranging from ≥250 ng/mL (the minimum inhibitory concentration at which, for most bacterial pathogens, 90% of isolates are susceptible) in 23 cases to <250ng/mL in 119 cases. Among 109 patients who were treated intravenously with a median azithromycin dosage of 10 mg/kg per day, the response to therapy was positively correlation with the level of drug concentration (P<0.05). Fewer adverse events were concerned in the cases.

Conclusions

We conclude that azithromycin therapeutic drug monitoring improves the efficacy of therapy and azithromycin is safe and well-tolerated drug in the treatment of children with lower respiratory tract infection.
STRUCTURAL BASIS OF RESPIRATORY SYNCYTIAL VIRUS SUBTYPE-DEPENDENT NEUTRALIZATION BY AN ANTIBODY TARGETING THE FUSION GLYCOPROTEIN

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Background and aims

A licensed vaccine for respiratory syncytial virus (RSV) is unavailable, and passive prophylaxis with the antibody palivizumab is restricted to high-risk infants. Recently isolated antibodies 5C4 and D25 are substantially more potent than palivizumab, and a derivative of D25 is in clinical trials.

Methods

Here we show that unlike D25, 5C4 preferentially neutralizes subtype A viruses.

Results

The crystal structure of 5C4 bound to the RSV fusion (F) protein revealed that the overall binding mode of 5C4 is similar to that of D25, but 5C4 makes fewer hydrogen bonds to mainchain atoms. Mutagenesis and virological studies demonstrated that RSV F residue 201 is largely responsible for the subtype specificity of 5C4.

Conclusions

These results improve our understanding of subtype-specific immunity and the neutralization breadth requirements of next-generation antibodies, and thereby contribute to the design of broadly protective RSV vaccines.
X-Linked Hyper-IgM Syndrome with Pulmonary Alveolar Proteinosis. The First Case Reported From China
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Background and aims
To report a case of X-linked hyper-IgM syndrome (XHIGM) with pulmonary alveolar proteinosis (PAS), and study the clinical diagnosis process and review of related literature.

Methods
The clinical, laboratory examination and genetic testing information of a case of XHIGM were analyzed and related literature was reviewed. Result The patient was a 11 months old boy, who was admitted to hospital because of recurrent cough, wheeze and hyponychium cyanosis.

Results
Blood test reveal a significantly increased white blood cell with eosinophilia (up to 32%); Serum immunoglobulin levels of IgA and IgG were significantly reduced, the IgM level was elevated. Fiberoptic bronchoscopy revealed that bronchoalveolar lavage fluid was like white soupy suspension, and the result of PAS stain was positive. The sequence from the CD40L gene had a 4-bp deletion, c300-303delAAAC. The patient had got well through antibiotic, respiratory management and intravenous immunoglobulin (IVIG). Conclusion Genetic analysis of the CD40L gene revealed a deletion mutation (c.300-303delAAAC), which has never been reported previously in the literature.

Conclusions
XHIGM with PAS was rare. Eosinophilia was a prominent clinical manifestation in the patient.
To Investigate the Role of PT-IgG and RT-PCR in the Diagnosis of Pertussis

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Background and aims

To investigate the role of anti-pertussis toxin IgG (PT-IgG) and real-time polymerase chain reaction (RT-PCR) in the diagnosis of pertussis, and to provide evidence for the early diagnosis of pertussis.

Methods

A retrospective analysis was made on the clinical and laboratory data of 466 children with pertussis in Xi’an Children’s Hospital between 2013 and 2016.

Results

The onset age mainly focused on <1 years old, mostly <6 months; Of these patients, 56.3% cases were male, 43.7% cases were female; 58.1% cases were not vaccinated or not full vaccination. The positive rate of RT-PCR was 86.3% (95%CI: 81.6%~ 88.7%), it showed no statistically significant difference in different gender; there has a significant difference in the positive rate of RT-PCR in different disease periods ( \( =37.731, p<0.05 \) ), the highest positive rate of RT-PCR is about 1 weeks (92.2%). The positive rate of PT-IgG in the study population was 43%, there was no statistical difference in the positive rates of PT-IgG at different sexes; There was a statistically significant difference at different age ( \( =33.935, p<0.05 \) ), the positive rate increased with age, but declined after 18 months; with the improvement of vaccination, the antibody positive rate increased ( \( =38.567, p<0.05 \) ); The positive rates of antibodies also increased with the progress of the diseases ( \( =35.870, p<0.05 \) ), the highest positive rate of PT-IgG is more than 5 weeks.

Conclusions

The positive rate of RT-PCR was higher than that of PT-IgG, early detection of RT-PCR is recommend for diagnosis in the early stages of pertussis;
Background and aims

To identify the prognosis of pediatric mycoplasma pneumoniae pneumonia risk factors and to provide instructions for the clinical therapy.

Methods

Clinical data of 872 cases of children with mycoplasma pneumoniae pneumonia from June 2010 to June 2014 in Beijing children's hospital were retrospectively reviewed. Based on the findings of X-ray and/or CT scan, the subjects were divided into two groups: sequelae group and control group. Comparison was made between the two groups in age, fever course, pleural effusion, complications, morphological characteristics, manifestation of on X-ray and/or CT scan.

Results

Incidences of fever course lasting more than 7 days, large pleural effusion, pneumonia located at the right upper lung and left lower lung, large patchy shadow and multiple system damage out of the lung were significantly higher in sequelae group than in control group (P<0.05).

Conclusions

Long fever course, large pleural effusion, pneumonia located at the right upper lung and left lower lung, large patchy shadow in the lung and multiple system damage out of the lung are the clinical risk factors for sequelae of MPP.
EFFECTS OF BACTERIAL AND VIRAL CO-INFECTIONS OF MYCOPLASMA PNEUMONIAE PNEUMONIA IN CHILDREN: ANALYSIS REPORT FROM BEIJING CHILDREN’S HOSPITAL BETWEEN 2010 AND 2014

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Background and aims

The objective of this study was to describe the rates and impact of bacterial and viral co-infections of hospitalized children with Mycoplasma pneumoniae pneumonia.

Methods

The clinical characteristics, hospital expenses, and differences between single and co-infection MPP were explored. This study included 5,009 children from 2010 to 2014. Infections with various pathogens were identified by the following tests: positive specimens culture, direct immunofluorescent antigen test for viruses, mycoplasma or chlamydia detection.

Results

The results indicated that 13.6% of them showed positive results, including bacterial pathogens in 2.5% of cases and viral pathogens in 9.8% of cases. The most commonly identified bacteria was Streptococcus pneumoniae. Influenza and parainfluenza were the most commonly identified virus. Hospitalization expenses of patients with single infections were less than those who with co-infections.

Conclusions

In conclusion, co-infections were more common in recent years. In severe MPP, rates of co-infection were higher than non-severe MPP. The longer the course of infection, the higher the co-infection rate.
NEW TRENDS OF VIRAL CO-INFECTION IN MYCOPLASMA PNEUMONIAE PNEUMONIA

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Background and aims

Our objective was to describe the rates and impact of viral co-infections in children with *Mycoplasma pneumoniae* pneumonia (MPP). Clinical characteristics, seasonal distribution, hospital expenses, and differences between single and viral co-infection MPP were explored.

Methods

Six thousand two hundred and eighty children admitted to Beijing Children’s Hospital and The Aerospace Center Hospital from January 2011 to December 2015 were enrolled in this study and various mixed infections investigated.

Results

The rate of viruses co-infection was 12.6%. The influenza and parainfluenza were the most common co-infecting viruses. Interestingly, the annual rates of co-infection in MPP patients increased from 7.2% in 2011 to 16.9% in 2015.

Conclusions

We also found that the longer the course of infection, the higher the risk of co-infection. Furthermore, the co-infection rates in severe MPP were higher than in non-severe cases (23.7% and 10.6%, respectively).
RESPIRATORY VIRUS ANALYSIS OF CHILDREN HOSPITALIZED WITH ACUTE ASTHMA EXACERBATIONS IN CHONGQING FROM 2009 TO 2016

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Background and aims

This study is designed to investigate the characteristics of virus of children hospitalized with asthma exacerbation, also identify the relationship between virus and severity of acute asthma exacerbations.

Methods

From June 2009 to December 2016, 407 nasopharyngeal aspirates (NPAs) from hospitalized children with acute asthma exacerbations were collected. PCR and QPCR were performed to detect respiratory syncytial virus (RSV), Influenza virus (IFV), parainfluenza virus (PIV), human metapneumovirus (HMPV), coronavirus (CoV), human rhinovirus (HRV), adenovirus (ADV), Human bocavirus (HBoV) and mycoplasma. Bacteria isolated at the same time.

Results

(1) 407 children with acute asthma exacerbations were enrolled, 365 children < 6 years of age, 42 children ≥ 6 years old, and 84 (20.6%) children characterized by severe exacerbations. The morbidity rate of man to women was 2.2 to 1. Among these 407 NPA specimens, 307 (75.4%) were positive for respiratory viruses, the detected viruses were RSV (113/407, 27.8%), HRV (108/407, 26.5%), PIV (62/407, 15.2%), HBoV (60/407, 14.7%), IFV (54/407, 13.3%), ADV (24/407, 5.9%), HMPV (14/407, 3.4%), and CoV (11/307, 2.7%). Bacteria culture was positive in 167 (43.5%), the first three pathogenic bacteria were streptococcus pneumoniae (80/384, 20.8%), haemophilus influenzae (40/384, 10.4%), and moraxella catarrhalis (36/384, 9.4%). 29 (7.5%) were positive for Mycoplasma pneumoniae, and 1 (0.3%) was positive for Pneumonia chlamydia.

Conclusions

Our results indicate that respiratory viruses were the most important pathogen of acute asthma exacerbations. HRV causes acute asthma exacerbations at any age, and RSV often causes severe asthma exacerbations in children <6 years old.
The Effect of Sex on Airway Inflammation and AHR post Respiratory Syncytial Virus Infection in BALB/c Mice

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Background and aims

This study is to investigate the sex-related difference in airway inflammation and AHR in animal models, and further to explore whether osteopontin (OPN) contributes to the difference.

Methods

Six- to eight-week-old female and male BALB/c mice were randomly divided into RSV group and control group, which were inoculated with RSV A2 strain (RSV group) and cell culture supernatant (control group) intranasally. Samples were collected on day 1, 3, 5, 7 (acute phase) and day 14, 21, 28 (later stage). AHR was measured by whole-body plethysmography. Left lung tissues were stained with HE and histopathological score (HPS) was performed. The concentration of OPN in BALF and lung tissues were separately detected by ELISA and western blot.

Results

(1) Compared to control group, RSV caused significant airway inflammation and lung tissue damage in both mice (P < 0.05). The difference reached the peak on day 5 and 7, and then decreased over time. Besides, the HPS of male mice on day 5 is significantly higher than female group, but there is no difference between the two groups at other time points. (2) RSV infection resulted in AHR in male and female group, and the disorder was significantly more severe on day 1, 3, 5, 7 in male group than in female group (P < 0.01), which reached the peak on day 5 (P < 0.001).

Conclusions

RSV caused more severe airway inflammation and AHR in male group than female group, but the symptoms lasted shorter.
CHARACTERISTICS AND OUTCOME OF RESPIRATORY SYNCYTIAL VIRUS INFECTION IN CHINESE CHILDREN WITH ACUTE LEUKEMIA - A SINGLE CENTER ANALYSIS

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Background and aims

To investigate the incidence, characteristics and outcome of respiratory syncytial virus (RSV) infection in Chinese children with acute leukemia,

Methods

We retrospectively reviewed the clinical data of 78 patients with RSV infection in the leukemia ward of Beijing Children's Hospital between March 2014 and February 2017;

Results

The incidence of RSV infection was 11.3%, and mortality rate was 0.4%. 84.6% of infection occurred in winter. The median age of onset was 2 years (range, 0.7-14 years). Most patients were male (60.3%) and had acute lymphoblastic leukemia (91.0%); 48.7% had received induction chemotherapy and 48.7% corticosteroid before RSV infection. Mixed infection was seen in 24 patients (30.8%). The onset age and corticosteroid before was associated with increased risk of mixed infection. Compared to the 38 patients with upper respiratory tract infection, the 40 patients with pneumonia had a higher median duration of the infection and a higher rate of delay chemotherapy (p<0.05). Multiple logistic regression analysis identified a low nadir absolute lymphocyte count as independent predictors of progression to pneumonia (p=0.037). Four patients died of RSV infection.

Conclusions

RSV infection in children with acute leukemia was clinical significant in the associated morbidity and delay in chemotherapy. In the absence of RSV-specific therapy, effective prevention for severe RSV infection must be investigated.
Background and aims

A 7-year-old girl who had been diagnosed as systemic lupus erythematosus (SLE) and lupus nephritis returned to our department for cyclophosphamide pulse treatment.

Methods

The patient’s temperature was normal and with no cough. The patient began to have fever since the second day in hospital, the highest temperature was 38.3 degree centigrade, and she began to cough.

Results

Ceftazidime was given to her to control the infection. The temperature was still high in the 6th day in hospital, and the patient began to feel pain in her right supraclavicular fossa. In physical examination, the patient had rapid respiratory rate and slightly cyanosis in her lip. Blood gas analysis, fungal β-D-glucan detection, subsets of lymphocytes and thorax CT-scan were given to her. The blood gas analysis showed decreased oxygen partial pressure and oxygen saturation. The fungal β-D-glucan detection was positive. The subsets of lymphocytes showed decreased CD3+CD4+ T-cells count. And the thorax CT-scan showed mediastinal emphysema, and high density changes in both lungs. Pneumocystis carinii pneumonia was suspected, so TMP-SMZ and micafungin were given to the patient, and the dosage of glucocorticoid was decreased.

Conclusions

And the patient recovered after two weeks’ treatment. Pneumocystis carinii pneumonia should be noticed especially in the patient with immunodeficiency or accepting immunosuppressive therapy. Early diagnosis and early treatment were very important to these patients.
Clinical Analysis of 23 Cases of Fungal Sepsis in Preterm Neonates

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Background and aims

To investigate the clinical fungal sepsis characteristics and pathogens and risk factors of fungal sepsis in preterm neonates to provide evidence for early diagnosis and treatment.

Methods

All preterm infants from May 2012 to May 2015 were selected. Pathogens of and clinical features were observed and analyzed, and the outcomes were recorded.

Results

A total of 2534 cases were admitted. Among the 23 infants were diagnosed with positive blood, including 14 very low birth weight infants and 5 extremely low birth infants. Compared with the preterm infants without fungal sepsis, low birth weight, small gestational age, venous catheter and long-term parenteral nutrition were the risk factors. 23 cases of fungal sepsis were due to Candida albicans, including 16 (69.6%) Candida parapsilosis, 6 (26.1%) Candida albicans, 1 (4.3%) Candida nameless. All of the Candida albicans were sensitive to fluconazole.

Conclusions

VLBW/ELBW preterm infants are susceptible of fungal septicemia. Venous catheter and long-term parenteral nutrition are the risk factors. The full treatment course can improve the prognosis.
Etiology and Pathogen Analysis of Hospitalized Children of Acute Respiratory Tract Infection in the Spring from 2015-2017

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Background and aims

Analyse the etiology and pathogen of hospitalized children of acute respiratory tract infection (ARI) in the spring from 2015 to 2017 to explore the pathogen distribution and migration of respiratory tract infection.

Methods

A total of 1,700 general hospitalized children in Union Hospital, Tongji Medical College, Huazhong University of Science and Technology in the spring from 2015 to 2017 were enrolled through retrospective analysis in the study.

Results

1. The rate of ARI hospitalized children accounted for general hospitalized children in the spring from 2015 to 2017 is 69.55% (402/578), 68.89% (445/646), 66.80% (318/476). 2. At least one type of pathogen was detected in 82 out of 1166 ARI hospitalized children and the overall positive rate was 7.03%. 3. MP was more common pathogen, whose detected rate was 4.63% (54/1166). In the spring, the positive rate of PIV detection was 3.34% (39/1166). 4. Pneumonia still accounts for the first cause of respiratory tract infection, the rate of pneumonia accounted for ARI in the three spring is 72.39% (291/402), 67.19% (299/445), 66.67% (212/318). 5. Pneumonia caused by PIV infection was more common in the three spring, the detection rate was 5.86% (15/291), 4.35% (13/299) and 5.66% (12/212). 6. The positive rate of MP of pneumonia in the three years was increasing. In 2017, the rate of MP rose to 8.96% (19/212), besides the positive rates of MP, CP and LP mixed infection was as high as 2.83% (6/212).

Conclusions

Respiratory infection is still the most common in general disease of children. Furthermore, pneumonia keeps the highest incidence of respiratory infection in children.
Background and aims

Summary and analyze the clinical manifestations, imaging characteristics and treatment of the adenovirus pneumonia in the acute phase, to help clinicians early diagnosis and treatment, then reduce complications and sequelae.

Methods

A retrospective study of children with adenovirus pneumonia was performed in 397 cases of Beijing children's hospital from April 2011 to March 2017, their average age was 28.22±31.93 months, among which 281 were male, and 116 were female. To describe their clinical features, analyze its clinical data, include heat peak, fever process, the presence of wheezing, onset age, gender, imaging findings, respiratory support, the usage of IVIG and systemic corticosteroids.

Results

Among 397 cases, with a males to females ratio of 2.42:1. 8.13% (33/397) cases were infants less than 6 months, accounting for 59.19%, 235 cases were aged 6 months to 2 years old; 129 cases were aged more than 2 years old. The onset of 111 patients was in spring, 82 in summer, 57 in autumn and 147 winter, among spring and winter accounted for 64.99%. 396 patients had fever, 92.17% (365) with high temperature over 39°C, 59.85% (237) with a fever lasting more than 10 days. All cases had cough in the early stage, 58.19% (231) with wheeze, 33% (131) with moist rales and wheezing in the lung. Laboratory tests: 129 (32.49%) cases with PCR positive, 69 cases of blood DNA positive (17.38%), 97 cases of nasopharyngeal secretions DNA positive (24.43%), blood and 78 cases of nasopharyngeal secretions positive (19.65%).

Conclusions

Adenovirus pneumonia is more common in children, characterized by acute onset and high risk, long fever process, and wheezing.
Objective: To evaluate T7-Dual Amplification assay in detecting of respiratory infection in children.

Methods: A total of 75 throat swab samples of patients with respiratory infection was collected, an optimized T7-Dual Amplification assay was designed to detect living type A influenza, type B influenza, respiratory syncytial virus, sendai virus, adenovirus, mycoplasma pneumonia.

Result: 2 out of 75 (2.67%) type A influenza was detected, 3 samples (4%) was showed type B influenza infection. 6 samples (8%) was detected with respiratory syncytial virus, sendai virus was shown in 11 samples (14.67%), only 1 sample (1.33%) showed adenovirus infection, 13 out of 75 (17.33%) mycoplasma pneumonia was detected.

Conclusions: The object of T7-Dual Amplification assay is mRNA of pathogen. It reflects the pathogens with active state in patients, with close clinical relevance, high application value.
EXPERIENCE IN DIAGNOSIS AND TREATMENT OF DISSEMINATED ASPERGILLOSIS FOR CHILDREN WITH LEUKEMIA AFTER CHEMOTHERAPY
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Background and aims

To investigate the clinical features, diagnosis, treatment and prognosis of disseminated aspergillosis for children with leukemia after chemotherapy.

Methods

The data of 3 cases disseminated aspergillosis for children with leukemia after chemotherapy were retrospectively analyzed with regard to clinical manifestations, auxiliary examination, process of diagnosis, treatment and prognosis.

Results

The underlying diseases of all recruited cases were leukemia, which were in complete leukemia remission before or during fungal infection period. There were many high-risk predisposing factors for invasive aspergillosis that were identified in the 3 patients. The major clinical features of disseminated aspergillosis in children with leukemia were prolonged and antibiotics uncontrollable fever, subcutaneous solid nodules, nodules or cavities in pulmonary CT, spread low density lesions in hepatosplenic and kidney in abdominal MR (T2 weighted) and serum aspergillus galactomannan antigen positive. The level of diagnosis of IFD was proven via histopathologic examination. Amphotericin B lipid complex was selected in antifungal therapy for two patients when they were diagnosed and the course of treatment was more than 4 weeks. Moreover, chemotherapy was advised for the 2 patients when clinical manifestations of disseminated aspergillosis improved significantly, neutrophil counts recovered and images did not deteriorate;

Conclusions

Children with leukemia after chemotherapy appeared the following manifestations, including fever, subcutaneous solid nodules, pulmonary nodules or cavities, spread low density lesions in hepatosplenic and kidney and serum aspergillus galactomannan (GM) antigen positive, which are strongly indicate disseminated aspergillosis. It is significant for prognosis to give consideration to both effective and adequate antifungal treatment and chemotherapy for leukemia right time.
ANALYSIS OF DETECTION RESULTS OF RESPIRATORY VIRUS ANTIBODY IgM IN 6298 CHILDREN

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Background and aims

To explore the epidemiological characteristics of respiratory virus antibody IgM by detecting and analyzing the results.

Methods

ELISA method was used to take 6298 cases of acute respiratory tract infection in patients with serum samples, four common respiratory virus IgM antibody test, and statistical analysis.

Results

a total of 6298 specimens were detected, the positive rate was 12.18% (767/6298). The infection rate was 13.28% and 14.79% in male and female. The positive rates of IFV, PIV, RSV and ADV were 8.69%, 3.56%, 1.67% and 0.17% respectively, and the total positive rate of mixed infection was 1.59%. The infection rate of five years was 10.17%, 10.32%, 13.73%, 10.27 and 31.08 respectively. 0-1 years old, 1-3 years old, 3-6 years old and 6-14 years old infection rates were: 9.41%, 12.89%, 17.33% and 16.51%. The infection rates were 10.83%, 17.21%, 14.42% and 13.17%, respectively.

Conclusions

ADV infection rate is the highest in children with respiratory tract infection. In the five years, the highest infection rate in 2015, 2015 and other years, there were statistically significant differences (P<0.05). As the age increases, the rate of infection is gradually increased, the rate of infection among children under 1 years of age is the lowest, and there is a significant difference between the infection rates of all age groups (P<0.05). Children's respiratory tract virus was high in summer, and there was a statistical difference between seasonal infection rates (P<0.05).
Background and aims

To explore the value of serum cholinesterase in children with severe pneumonia.

Methods

Collected 45 cases of hospitalized severe pneumonia in the period from April 2015 to February 2017, 45 cases of children with common pneumonia, 45 cases of outpatient physical examination healthy children as control group. In the control group, the normal pneumonia group was tested for serum cholinesterase level on the the first day of admission. The severe pneumonia group was examined by blood culture and serum cholinesterase level on the first day of admission. Serum cholinesterase levels were measured on days 5-7.

Results

The level of serum cholinesterase in severe pneumonia group was significantly lower than that in normal pneumonia group and healthy control group (P <0.05). There was no significant difference between common pneumonia group and healthy control group (P> 0.05). On the day of admission, to observe serum cholinesterase level of the patients with severe pneumonia between the blood culture positive group and the blood culture negative group, there was no significant difference between the two group(P>0.05). The level of serum cholinesterase in the treatment group was significantly higher than that before treatment (P <0.05). The levels of cholinesterase in the treatment improvement group were significantly higher than in the treatment deterioration group, Statistically significant (P <0.05).

Conclusions

Dynamic monitoring of serum cholinesterase levels can assess the severity and prognosis of severe pneumonia.
Clinical The Value of Serum Cholinesterase in Children with Severe Pneumonia
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Background and aims

To explore the value of serum cholinesterase in children with severe pneumonia.

Methods

Collected 45 cases of hospitalized severe pneumonia in the period from April 2015 to February 2017, 45 cases of children with common pneumonia, 45 cases of outpatient physical examination healthy children as control group. In the control group, the normal pneumonia group was tested for serum cholinesterase level on the first day of admission. The severe pneumonia group was examined by blood culture and serum cholinesterase level on the first day of admission. Serum cholinesterase levels were measured on days 5-7.

Results

The level of serum cholinesterase in severe pneumonia group was significantly lower than that in normal pneumonia group and healthy control group (P <0.05). There was no significant difference between common pneumonia group and healthy control group (P> 0.05). On the day of admission, to observe serum cholinesterase level of the patients with severe pneumonia between the blood culture positive group and the blood culture negative group, there was no significant difference between the two group(P>0.05). The level of serum cholinesterase in the treatment group was significantly higher than that before treatment (P <0.05). The levels of cholinesterase in the treatment improvement group were significantly higher than in the treatment deterioration group, Statistically significant (P <0.05).

Conclusions

Dynamic monitoring of serum cholinesterase levels can assess the severity and prognosis of severe pneumonia.
TO EXPLORE THE APPLICATION OF FLEXIBLE BRONCHOSCOPE IN DIAGNOSIS OF CHILDHOOD NECROTIZING PNEUMONIA
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Background and aims

To analyze necrotizing pneumonia the Clinical characteristics of bronchoscope examination and prognosis, the purpose is improve the diagnosis of necrotizing pneumonia.

Methods

We collected 35 cases of necrotizing pneumonia in our hospital department of pediatrics which diagnosed through lung CT, retrospective study the bronchoscope characteristics and summarized the related performances of “rice decoction” lavage and turbid lavage respectively.

Results

In the 35 cases, there were 21 cases(60%) of "rice decoction" lavage and 14 cases(40%) of turbid lavage, and the combination of bronchial stenosis, mucosal ulcer and phlegm blocked. The brush cytology through the bronchoscope, the bacterial positive was 8 cases (22.9%) and the turbidity group was 2 cases (5.7%). In the etiology, the “rice decoction” group was all mixed infection with mycoplasma, there were 11 cases of mixed infection in turbid group. After treatment, there were 11 cases (31%) of bronchial occlusion and/or softening, the another is 6 cases(17%). At the same time, We compare the discovery time between the rice decoction lavage and the diagnosis time of the lung CT, there were 15 cases which earlier than the diagnosis time of lung CT in "rice decoction” group.

Conclusions

There are some guiding significance in the early stage diagnosis of necrotizing pneumonia through flexible bronchoscopy and to some extent, earlier than the imaging diagnosis.
CLINICAL CHARACTERISTICS OF 67 CHILDREN WITH PARAPNEUMONIC PLEURAL EFFUSION DUE TO MYCOPLASMA PNEUMONIAE

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Background and aims

To explore the clinical characteristics of parapneumonic pleural effusion (PPE) caused by Mycoplasma pneumoniae in hospitalized children.

Methods

The clinical data of patients with PPE caused by Mycoplasma pneumoniae admitted to Shenzhen Children’s Hospital between January 2014 and December 2016 were retrospectively analyzed.

Results

For all the 67 patients, 37 males and 30 females, mean age 5.42 years (range 1 month - 14 years). The median duration of hospital stay was 8 days (between 5 and 25 days). The most common symptoms included fever plus cough (58, 86.6%), cough (8, 11.9%), and fever (1, 1.5%). Small and medium pleural effusion were common imaging appearances (64, 95.5%). 36 patients (53.8%) had pleural effusion located on the right, 12 (17.9%) on the left, and 19 (28.4%) on both sides. 18 cases with the atelectasis, 2 with the necrotizing pneumonia and 1 cases with the plastic bronchitis. 7 cases diagnosed as refractory mycoplasma pneumonia at last. 26 patients were treated with erythromycin, 24 azithromycin and 17 sequential treated with erythromycin and azithromycin. 7 patients were treated combined with steroids, 4 with gamma globulin. 4 patients were treated with close chest tube drainage. 65 (97%) patients were recovered less than two weeks.

Conclusions

PPE caused by Mycoplasma pneumoniae in the group were mainly in the preschool children. Fever and cough were the primary symptom of PPE. Small and medium pleural effusion were common imaging appearance. Macrolide drug was effective. We should pay attention to some patients may be formed to necrotizing pneumonia and plastic bronchitis.
DETECTION OF HBD-3 IN CHILDREN WITH REFRACTORY MYCOPLASMA PNEUMONIAE PNEUMONIA AND ITS SIGNIFICANCE
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Background and aims

hβD-3 is a kind of defensin family, which is a cationic antimicrobial peptide with potent bactericidal activity in vitro and in vivo. It has a good prospect in the prevention and treatment of infectious diseases. To explore the correlation between the bronchoalveolar lavage fluid (BALF) and serum hβD-3 level with the serum LDH level in children with refractory Mycoplasma pneumoniae pneumonia (RMPP).

Methods

Collected from January 2016 to January 2017 due to the diagnosis of MPP need bronchoscopy bronchial alveolar lavage inpatients in 63 cases. According to the diagnostic criteria of RMPP, MPP group was divided into RMPP group (28 cases) and normal MPP group (35 cases). Both groups were given lavage fluid and blood samples.

Results

The levels of hβD-3 in RMPP group were significantly lower than those in normal MPP group (P < 0.05); the levels of plasma LDH in the two groups were different, and the difference was statistically significant (P < 0.05) in the RMPP group compared with the normal MPP group; Statistical analysis of children with BALF, plasma hβD-3 concentration and plasma LDH levels were negatively correlated.

Conclusions

The decrease of hβD-3 level may be related to the pathogenesis of RMPP.
THE 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE IS EFFECTIVE AGAINST HYPOXIC PNEUMONIA IN CHILDREN IN LAO PDR

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Background and aims

Pneumonia is a leading cause of childhood mortality and approximately one third of these deaths are due to pneumococci. Pneumococcal conjugate vaccines (PCVs) have reduced hypoxic pneumonia in young children by 47-61%. Data are limited on the 13-valent PCV (PCV13) vaccine effectiveness (VE) in Asia and, in particular, low-income countries (LICs). In 2013, Laos added PCV13 to its national immunisation program. The aim of this study is to determine the PCV13 VE against hypoxic pneumonia in children in Laos.

Methods

A prospective cohort study of children up to 59 months old admitted with pneumonia to Mahosot Hospital, Vientiane was undertaken over three years (Dec 2013-Dec 2016). Severe pneumonia was defined as per WHO guidelines. Hypoxic pneumonia included those with an oxygen saturation <90%. PCV13 status was determined by written record. VE was calculated using odds ratios, estimated using logistic regression models. We report both crude and adjusted odds ratios, where models were adjusted for age, comorbidities and date of enrolment. The odds ratios were converted to measures of VE using the formula: VE= (1-Odds ratio)*100.

Results

There were 634 children with pneumonia and 34% had hypoxic pneumonia. Preliminary analysis showed an unadjusted and adjusted VE against hypoxic pneumonia of 38.4% (95%CI: 8.7, 58.5, p=0.016) and 48% (95%CI: 20.7, 65.9, p=0.002), respectively.

Conclusions

These findings are consistent with two studies from Africa and are the first results to show that PCV13 is effective against hypoxic pneumonia in Asia. PCV13 is likely to contribute to reducing child mortality in this region.
Background and aims

To investigate the impact of recombinant human interferonα1b (rhIFNa1b) treatment of infants hospitalized with lower respiratory infections on subsequent wheezing.

Methods

The clinical data of infants in 22 hospitals with viral pneumonia, wheezy bronchitis or bronchiolitis were retrospectively reviewed from June 2009 to June 2015. Age at follow-up, birth history, children and family history of allergy, feeding history, family environment, and the number of wheezing episodes within the last year were obtained by telephone and questionnaires. Based on the use of rhIFNa1b when in hospital, the subjects were divided into two groups. A comparison was made between the two groups in terms of wheezing episodes within the last year. Based on the number of the wheezing episodes within the last year, the subjects were divided into two groups. Comparisons were made between the two groups in baseline data. If the result of the single factor comparison showed that P<0.05, the indicators were analysed by logistic regression.

Results

(1) Of 602 cases for which follow-up data were available, 62 cases were excluded. Finally, 540 patients were included in the analysis. (2) 35 cases (13.8%) out of 253 cases treated with rhIFNa1b...
and 60 cases (20.9%) out of 287 cases without rhIFNa1b treatment had wheezing episodes within the last year. The difference in wheezing episodes within the last year between the two groups was statistically significant (P=0.031). (3) The result of logistic regression showed that no use of rhIFNα1b therapy (OR=1.70, P=0.028) was a risk factor of subsequent wheezing.

**Conclusions**

The use of rhIFNα1b treatment for infants hospitalized with lower respiratory infections could be useful for reducing the morbidity of subsequent wheezing.
PCFS MODULATES RSV-INDUCED ANTIVIRAL IMMUNE RESPONSES THROUGH IFN-α/β -STAT1 SIGNALING PATHWAY VIA VASOACTIVE INTESTINAL PEPTIDE SECRETION

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Background and aims

Respiratory syncytial virus (RSV) infection is the major cause of respiratory tract infection in infants worldwide. Previously we showed that PCFs degeneration alleviated RSV-induced airway disorders by increasing IFN-α/β-STAT1 antiviral signaling. In this study, we further investigate the mechanism of how PCFs regulate the IFN-α/β-STAT1 antiviral signaling.

Methods

(1) PCF-degenerated mice and intact mice were infected with RSV, then samples of 12-48h post-infection were collected to detect the level of pattern recognition receptors (PRRs) (RIG-1, TLR3), STAT1 and pSTAT1, as well as interferon-stimulated gene (ISGs) (IP-10, Mx1). Furthermore, neuropeptides such as SP, CGRP and VIP were detected. Moreover, VIPhyb (a pan VIP receptors antagonist), VIP or VPAC1 agonist were administrated to assess the role of VIP in IFN-α/β-STAT1 mediated anti-viral responses.

Results

PCFs degeneration induced a potent antiviral effect following RSV infection and increased VIP secretion. VIPhyb treatment suppressed RSV-induced antiviral responses in KPCF mice: PRRs expression, IFN-α/β secretion, STAT1 activation and ISGs induction were all depressed, and virus titers were increased. VIP and VPAC1 agonist treatment enhanced RSV-induced antiviral responses in intact mice: PRRs expression, IFN-α/β secretion, STAT1 activation and ISGs induction were all increased, and virus titers were declined.

Conclusions

We concluded that PCFs degeneration increased VIP secretion and VIP had a role in promoting RSV-induced antiviral effect by inducing IFN-α/β-STAT1 signaling. Thus targeting PCFs activation represents an alternative strategy for RSV infection, and the possibility that VIP promotes RSV-induced antiviral effect potentiates new pharmaceutical applications of this neuropeptide.
PULMONARY C-FIBER DEGENERATION DOWNREGULATES IFN-γ RECEPTOR 1 VIA IFN-α INDUCTION TO ATTENUATE RSV-INDUCED AIRWAY HYPERRESPONSIVENESS

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Background and aims

Respiratory syncytial virus (RSV) is a leading cause of respiratory infection in infants. Unfortunately, no effective vaccine or treatment against RSV is currently available. Pulmonary C-fibers (PCFs) are critical for regulating pulmonary inflammation and airway hyperresponsiveness (AHR). We previously reported that IFN-γ partially mediated RSV-induced airway disorders. In this study, we further investigate the relationship between PCFs and IFN-γ-mediated airway inflammatory response.

Methods

(1) PCF-degenerated mice and intact mice were infected with RSV, then airway inflammation, AHR and IFN-γ levels in BALF were evaluated. (3) IFNGR1 expression were detected and IFNGR1 neutralization were performed to evaluate the role of IFNGR1 in RSV-induced airway disorders. (4) STAT1/pSTAT1 expression were detected, IFN-α/β levels in BALF were detected; Furthermore, recombinant mouse IFN-α was administrated to investigate the relationship between IFN-α and IFNGR1.

Results

PCF degeneration alleviated RSV-induced airway inflammation, especially AHR by downregulating IFN-γ receptor 1 (IFNGR1), but had no effect on IFN-γ induction. In contrast, PCF degeneration actually increased IFN-α/β levels, as were the levels of STAT1 and phosphorylated STAT1 (pSTAT1). Exogenous IFN-α treatment induced STAT1 activation and downregulated IFNGR1 expression.

Conclusions

These results suggest that PCFs affect IFNGR1 expression by inducing IFN-α to regulate IFN-γ-mediated airway inflammation and AHR. Thus, targeting PCFs activation may help control RSV-induced airway disorders, especially AHR, even with the presence of inflammation.
Background and Aims

Respiratory Syncytial Virus (RSV), a leading cause of acute lower respiratory infection in hospitalized infants and young children, is possibly the next most promising vaccine-preventable disease worldwide. The purpose of the study was to describe the annual and seasonal trends of RSV infection among hospitalized children with pneumonia for nine consecutive years in north China.

Methods

Longitudinal data on laboratory-confirmed RSV infections collected from childhood pneumonia surveillance in Beijing during 2007-2015 were used in a multivariable general additive model allowing for non-linear and linear relations.

Results

Of 4,411 hospitalized children with pneumonia, 1,312 children (29.7%) had RSV identified. The prevalence of RSV changed dynamically. A distinct five-year cyclic trend and a strict annual seasonality peaking between January and February was consistently observed during these nine years. Age had a strong decreasing monotonic impact on RSV infection (p<0.001). Low-levels of circulating influenza viruses during the year was associated with increased activity of RSV subgroup A (adjusted odds ratio [aOR]=0.48, 95% CI: 0.32-0.72). RSV subgroup B was found more frequently among children with congenital heart disease (aOR=1.45, 95% CI: 1.03-2.04), but less frequently among children admitted into the intensive care unit (aOR=0.29, 95% CI: 0.16-0.5).

Conclusions

Our study provides a better understanding of RSV dynamics in pediatric populations severely ill with pneumonia in North China and can be used to inform future RSV vaccination policy.
THE ETIOLOGY OF COMMUNITY-ACQUIRED PNEUMONIA IN HOSPITALIZED CHILDREN

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Background and aims

Community-acquired pneumonia (CAP) is a common infectious disease threat to children's health all over the world, and it has become the first cause of death in children under five years old globally. It’s about two million children died of pneumonia each year, accounting for one-fifth of the world's child deaths. Our aim was to analyze the etiology of community-acquired pneumonia in hospitalized Children.

Methods

A retrospective, descriptive study was undertaken of 1853 children 0-18 years admitted to Beijing Children’s Hospital for CAP from January 2013 to December 2013. The etiology characteristics of community-acquired pneumonia children in different age and season were analyzed. SPSS 19.0 (SPSS Inc, Chicago, IL) was used for statistical analyses.

Results

The etiology characteristics of community-acquired pneumonia children in different age and season as follows: (1) 1447(78.1%) patients were positive for at least one pathogens. The bacteria positive rate was 27.0%, and the most frequent detected bacteria was streptococcus pneumonia, followed by haemophilus influenza and klebsiella pneumonia; the virus positive rate was 22.5%, the most common detected virus was respiratory syncytial virus, followed by adenovirus; Mycoplasma pneumonia positive rate was 48.7%; Mixed infection rate was 23.0%. (2) Bacterial and virus often infect with children under 1 years old. On the contrary, mycoplasma pneumoniae infection rate increased along with the age growth. The different pathogens showed the varies nature of seasonality.

Conclusions

The etiology characteristics of community-acquired pneumonia children are vary in different age and season.
Background and aims

To study the features of lung ultrasonography (LUS) in lung diseases and evaluate the value of LUS in pediatric intensive care unit (PICU).

Methods

537 children hospitalized from September 1, 2016 to March 31, 2017, in pediatric intensive care unit of Baoan Maternal and Child health Hospital were included in this study. All the children in the study were examined by LUS and diagnosed by medical history, clinical manifestation, laboratory examination and signs of X-ray or chest CT. The findings of LUS were compared with them.

Results

There were 75 cases (14.0%) with no lung diseases and 462 cases (86.0%) with lung diseases. The main features of children with lung diseases on LUS were as follows: pleural line abnormalities, A-lines disappearance, lung consolidation, interstitial syndrome, pulmonary edema. The signs of A-lines, pleural line, interstitial syndrome, lung consolidation and pulmonary edema could be used to monitor the conditions of children with lung diseases. Furthermore, compared with X-ray, LUS was much easier to find the lesions of patients with lung diseases. The findings of LUS in children with no lung diseases included A-lines, pleural line and did not include abnormal signs of lung consolidation and interstitial syndrome.

Conclusions

The diagnosis of LUS is precise in lung diseases. Moreover, LUS has more advantages, including no radiation and monitor the diseases on bed without interference the treatment. Therefore, it is necessary that LUS should be routinely used in PICU.
CLOSTRIDIUM BUTYRICUM CGMCC0313-1 ALLEVIATES AIRWAY REACTIVITY EXACERBATED BY RESPIRATORY SYNCTIAL VIRUS INFECTION DURING ALLERGIC AIRWAY INFLAMMATION

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Background and aims

Viral infections are the most frequent cause of asthma exacerbations and are linked to increased airway reactivity (AR) and inflammation. Probiotic bacteria can induce immune regulation or immune tolerance in patients with allergic diseases. There has been a growing interest in the use of beneficial bacteria for allergic diseases recently. However, there is rarely study of probiotic bacteria on asthma exacerbated by virus infection. This study aimed at exploring whether Clostridium butyricum CGMCC0313-1 (C. butyricum) can alleviate allergic airway inflammation exacerbated by respiratory syncytial virus (RSV) in a mouse model.

Methods

Mouse model of allergic airway inflammation aggravated by RSV was used in this study. C. butyricum was administered daily to the mice by the oral route. Airway function, pulmonary airway inflammation, T helper (Th)-specific cytokines and Eotaxin, and histopathological alterations were examined.

Results

C. butyricum significantly reduced lung resistance in the asthmatic mice. Pulmonary airway inflammation, airway remodeling, the expression of high-mobility group box 1 (HMGB1) and Toll-like receptor 9 (TLR9) were suppressed by oral C. butyricum. It also reversed the imbalance of Th1/Th2 and decreased the levels of Eotaxin.

Conclusions

C. butyricum alleviates allergic airway inflammation exacerbated by RSV in mice and might be an additional or supplementary therapy for allergic asthma aggravated by virus infections.
THE ASSOCIATION BETWEEN RESPIRATORY SYNCYTIAL VIRUS PERSISTENT INFECTION AND OVER-ACTIVATION OF TREML 4/TLR 7 SIGNALLING PATHWAY IN THE RAT NEPHROPATHY MODEL

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Background and aims

It is reported that TREML4 mediates the anti-viral immunoreaction against ssRNA virus such as influenza virus. However, the over-expression of TREML4 may lead to autoimmune diseases like SLE. This research explores the status of RSV persistent infection, the immune disorders in the model and the role of TREML4/TLR7 over-signaling in the development of the nephropathy.

Methods

Male SD rats were inoculated with 6×10⁶ PFU RSV solution and PBS to establish the RSV nephropathy rats model and the control group. On day 7, 15, 30, 60, 90, 120 after inoculation, RSV F and G protein were detected from lung, spleen and kidney samples on each time point of both groups by western blot. RSV F gene and G gene were detected by RT-PCR. The expression of TREML4 and TLR7 protein and their genes from spleens on each time point of both groups were detected by western blot and qRT-PCR. The level of downstream cytokines (TNFα, IL-12p40, IFN-β, CXCL10) and their mRNA from spleen samples were detected by Elisa and qRT-PCR.

Results

RSV nephropathy rats model were duplicated successfully. Various degrees of pathological changes could be observed in kidneys, lungs, spleens of the rats under LM and EM on day 7, 15, 30, 60, 90 and 120 post RSV infection.

Conclusions

RSV persistent infection was demonstrated in the nephropathy rat model till 120 days after inoculation. The over activation of the TREML4/TLR7 signaling pathway was not seen after RSV infection. Thus the specific mechanism for the immune disorder of the RSV nephropathy rat model remains to be further investigated.
ANALYSIS OF 400 PATHOGENS OF COMMUNITY-ACQUIRED PNEUMONIA IN CHILDREN

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Background and aims

To investigate the detection and distribution of respiratory pathogens in children with community acquired pneumonia.

Methods

Collect 400 cases of respiratory tract secretions (sputum, pleural effusion, bronchoalveolar lavage fluid) and blood specimens in children with community acquired pneumonia diagnosed in our hospital from December 2014 to December 2015, including 1) Mycoplasma pneumoniae IgM antibody, Mycoplasma pneumoniae antibody titers; 2) a total of 17 kinds of virus test (Luminex) (RSV, Flu A, H1, H3, Flu B, PIV1, PIV2, PIV4, HMPV, PIV3, HAdV, EV+Rh, HBoV, NL63, HKU1, 229E, OC43); 3) bacterial culture of blood and respiratory secretions; 4) G and GM tests, fungi culture of respiratory secretions.

Results

1. The incidence of Mycoplasma is more than all of the other pathogens accounted for more than half, followed by viral pneumonia and bacterial pneumonia; 2. The incidence of Mycoplasma pneumonia and viral pneumonia in cold season is not always more than in warm season. The epidemic is significantly related to years in cold season; 3. The incidence of Mycoplasma pneumonia is gradually increased with age, but viral pneumonia is decreased with age. The infection of infants is dominated by virus, but mycoplasma in school children; 4. The most common virus in winter are respiratory syncytial virus, human metapneumovirus and adenovirus, but parainfluenza virus 3 in summer; 5. Infants are usually infected with respiratory syncytial virus and parainfluenza virus 3, but the most common virus in toddler are enteric viruses, rhinovirus and Boka viruses; 6. Mycoplasma pneumonia is more common in female, but viral pneumonia in male.

Conclusions

Community-acquired fungal pneumonia is rare, but also be noted.
MULTICENTER CLINICAL STUDY OF RECOMBINANT HUMAN INTERFERON A1B INHALATION IN THE TREATMENT OF RSV (+) BRONCHIOLITIS IN CHILDREN

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Background and aims

Multicenter clinical observations were performed by larger samples, To observe the effect of atomizing inhalation of interferon on bronchiolitis. To provide reference for rational use of drugs for pediatricians.

Methods

A randomized, open, controlled, multicenter study was conducted, between May 2015 and May 2017, Cases were collected from 3 hospitals, A total of 104 valid cases were enrolled, There were 53 cases in the control group and 51 cases in the observation group.

Results

Treatment of RSV (+) bronchiolitis by Interferon nebulization therapy: For a shorter duration of three concave syndrome, cyanosis, wheezing and improve the rate of promotion; Compared with the control group, These effects were more pronounced during the treatment period (2-6 days); No adverse events occurred, Good security.

Conclusions

Treatment of RSV (+) bronchiolitis by Interferon nebulization therapy had Good security.
**Background and aims**

To investigate the impact of viral and bacterial co-infection in hospitalized children with *Mycoplasma pneumoniae* pneumonia (RMPP).

**Methods**

Retrospective analysis of 400 children with RMPP in our hospital admitted between January 1, 2011 and December 31, 2016 was performed. Nasal aspirate samples was collected for pathogen detection and clinical data were collected. We analyzed clinical characteristics, lung imaging characteristics and pathogenic species among these children.

**Results**

Of the 400 RMPP cases, 109 (27.25%) had co-infection with other pathogen, with *Streptococcus pneumoniae* (*S. pneumonia*), *Haemophilus influenzae* (*H. influenzae*) and *Staphylococcus aureus* (*S. aureus*) being the most common bacteria of infection and human bokavirus (HBoV), human rhinovirus (HRV), respiratory syncytial virus (RSV) being the most common viruses of infection. Children with co-infection was younger than that with single infection (*P* = 0.012). And children with both virus and bacteria co-infection had were the youngest (*P* = 0.038). Children with co-infection had a longer fever process, higher leukocyte count, and high percentage of C-reactive protein>38mg/L compared with single infection (*P* < 0.05). Children with co-infection had a higher percentage of pneumothorax and diffuse large area of inflammation in chest x-ray manifestation compared with children with single infection (*P* < 0.05).

**Conclusions**

*S. pneumonia* and HBoV was the leading cause of co-infection in RMPP. Co-infections led to more disease severity in children with RMPP compared with single infections.
X-link hyper-IgM Syndrome Complicated Interstitial Lung Disease Induced by Virus in Two Pediatric Cases and Literature Review

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Background and aims

To enhance the clinical recognition of X-link hyper-IgM syndrome complicated interstitial lung disease induced by virus in children.

Methods

In this study, the clinical information, immunologic and imangenological characteristics, genetic findings and outcome of 2 pediatric patients at Guangzhou Women and Children’s Medical Center were evaluated and literature review.

Results

1. Two patients were male and the age of onset all under six months. They developed interstitial lung disease with severe hyoxemia and polypnea caused by virus infection within two weeks. 2. Respiratory tract pathogens were detected by adenovirus (case 1) and cytomegalovirus (case 2). The inspection immunological aspects showed an elevation of serum IgM levels and CD19+B cells. A markedly reduction in levels of serum IgG with normal to reduced IgA. Serum IgE levels, NK cell count and neutrophil respiratory burst function test were normal. 3. Mutation analysis of two patients revealed CD40L gene mutation within Exon 5. Deletion of thymine at nucleotide position 488 (c.488delT) which prevent CD40L protein expression in case 1. The second case at nucleotide position 761 (c.761C>T), which resulted in aminoacid change (p.T354M). Sequence analysis in the family confirmed a de novo mutation.

Conclusions

Pediatric patients with X-link hyper-IgM syndrome could developed interstitial lung disease in a short time induced by virus. The immunologic function and genetic examination should be evaluated when a rapid progress on pulmonary interstitial lesions in infant. The need for further evaluation of treatment for prognosis. The sustained high level of serum IgM may be the risk factor related to mortality in children with XHIGM.
EFFICACY AND SAFETY OF A 2-YEAR STEP DOWN AND WITHDRAW INHALED CORTICOSTEROIDS STRATEGY FOR ASTHMATIC CHILDREN RECEIVING HOUSE DUST MITE ALLERGEN IMMUNOTHERAPY

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Background and aims

Withdraw inhaled corticosteroids (ICS) has been under intense debate due to its influence on the growth of asthmatic children. However, there is no clearly defined withdraw strategy. A 2-year ICS withdraw strategy has been developed for asthmatic children receiving 3-year subcutaneous immunotherapy (SCIT). The present study was aimed to report its efficacy and safety.

Methods

13 allergic asthma children were analyzed. Asthma control medicine was given according to the Global Initiative for Asthma (GINA) guidelines. ICS was discontinued when the children met the following conditions: one puff per day with good control for at least 6 month, FEV1/FVC≥80% and SCIT has been done for 24 months. Childhood asthma control test (C-CAT), pulmonary function measurements and methacholine bronchial provocation test were the main endpoints.

Results

A total of 13 children were available to analysis. Before SCIT, children were given 10 (rang, 1-24) months of asthma control medication. The children discontinued medication after 24 (range, 23-24.5) months of SCIT. At the time of withdraw ICS, the PD20 improved from 0.213mg (range, 0.023-1.840mg) to 1.013mg (range, 0.040-2.500mg) (p=0.095). After completion of SCIT, C-CAT and FEV1/FVC was improved significantly. The PD20 continued to improve (median, 2.320mg, range, 0.300-2.5mg) (p=0.002) with 5 children achieved negative results. No children experienced an exacerbation and asthma control medicine was not administrated.

Conclusions

The present study developed a 2-year step down and withdraw ICS strategy for allergic asthma children receiving HDM SCIT with acceptable efficacy and safety profile.
Background and aims

Pulmonary artery sling may cause pressure on the trachea and/or esophagus at varying degrees resulting in symptoms. The aim of this study is to assess the presentation symptoms, diagnostic methods and treatment results of patients, who presented to our hospital due to pulmonary artery sling.

Methods

A retrospective review of 74 patients who had PAS between January 2010 and June 2016 was conducted. Totally, 74 cases who had received echocardiography, computed tomography and fiberbronchoscopy were enrolled. There were 43 boys and 31 girls, and the median age of diagnosis was 4 months (2months–10.25months). The image findings of associated cardiovascular and pulmonary anomalies were reviewed and analyzed, along with the clinical manifestations and patients' outcome.

Results

In 74 PAS children, the main clinical manifestations were wheezing (52.35%), polypnea (18.91%), stridor (8.1%), malnutrition (18.92) and so on. Especially 16 cases (21.62%) didn’t had symptoms of respiratory. The onset age of 58 cases (78.38%) was before six months and 70 (94.59%) cases was before twelve months. The diagnostic rate was 93.06% for echocardiography and 100% for computed tomography. 46 children received surgery in our hospital, but 28 children were not. The mortality was 46. The outcome of the surgery is that 44 PAS children who received surgery treatment got favourable prognosis finally and 2 cases died.

Conclusions

CT images can accurately delineate the anatomy of the PAS and associated tracheal pathology. LPA re-implantation is an important means of relieving the left pulmonary artery compression.
THE CLINICAL AND ANATOMICAL MORPHOLOGY CHARACTERISTICS OF BRIDGING BRONCHUS (BB) IN CHILDREN

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Background and aims

To identify the clinical and anatomical morphology characteristics of bridging bronchus (BB) in children and to explore its diagnostic strategy, treatment and risk factors.

Methods

A retrospective study was performed on 23 pediatric patients with BB who were admitted to our Medical Center between 2010 and 2016. All their clinical features, imaging examination, treatment and outcomes were reviewed and analysed.

Results

1. Among the 23 patients with BB, 15 were male and 8 were female. The age of onset of BB was from born to 4 years old and had a median age of 3.17 months. 2. Most patients exhibited coughing (100%), wheezing (87.0%), recurrent pneumonia (82.6%), cyanosis (34.8%). 3. There are 17 cases were type I and 4 cases were type II according to Wells. Two cases were anterior BB (BB emanated from the anterior position of the carina). There were two cases who have atypical anatomical morphology in type I and type II respectively. The remaining three patients with SLPA in which two died and one has been lost to follow-up.

Conclusions

BB is a rare tracheobronchial malformation that might be associated with stenosis or bronchomalasia, and cardiac or vascular anomalies. Severity of clinical symptoms depends on whether combined with tracheal stenosis and/or bronchomalacia. Its morphological and anatomical performance varies and its classification needs to be further improved. The definitive diagnosis of BB requires the combination of different imaging modalities. Surgical procedures for relief of bronchial stenoses due to SLPA and could get better curative effect. However, surgical management of long-segment tracheal stenosis remains challenging.
THE CLINICAL VALUE OF SERUM ALBUMIN AND PREALBUMIN LEVELS IN CHILDREN WITH LOBAR PNEUMONIA CAUSED BY MYCOPLASMA PNEUMONIA

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Background and aims

In this study, the difference of serum Alb and PA levels between lobar pneumonia and non lobar pneumonia infected by MP was analyzed, so as to explore the clinical diagnostic value of serum Alb and PA for predicting lobar pneumonia in children with MP pneumonia.

Methods

A retrospective study was conducted between May 2014 and May 2015 among hospitalized children above 5 years of age diagnosed with MP pneumonia. According to the results of chest X-ray and / or lung CT examination, children were divided into lobar pneumonia group (disease group) and non lobar pneumonia group (disease control group). Healthy children admitted during the study period who were undergoing elective surgery were selected as healthy controls, matching in age and gender.

Results

Receiver operating characteristic(ROC) curve showed that the area under the curve(AUC) of Alb and PA was 0.664 (0.583-0.745) and 0.628 (0.543-0.713) respectively. With a cutoff of 41g/L and 88g/L, the sensitivity was 71.70% and 51.89% and the specificity was 83.10% and 76.06%; The positive likelihood ratio(+LR) was 4.24 and 2.17 and negative likelihood ratio(-LR) was 0.34 and 0.63; The positive predictive value(PPV) was 70.37% and 74.32 %, and negative predictive value(NPV) was 56.52% and 51.43%.

Conclusions

Serum Alb and PA levels can predict the degree of inflammation in children with MP-CAP. Prospective clinical studies should be undertaken in the future to further evaluate the diagnostic value of these two indicators among children with MP lobar and non-lobar pneumonia at the early stage of the disease.
Background and aims

Acute respiratory infection (ARI) is a major cause of morbidity and mortality worldwide. The purpose of the study was to determine the prevalence of common respiratory viruses in patients with ARI attending at different hospital settings in north China.

Methods

Laboratory-based surveillance for ARI was conducted at inpatient and outpatient settings of 11 hospitals in North China. The first 2-5 patients with ARI were recruited in each hospital weekly from 2012 through 2015. The presence of respiratory viruses was screened by PCR assays.

Results

In total, 3,487 hospitalized inpatients and 6,437 outpatients were enrolled. The most commonly detected viruses in the hospitalized cases were respiratory syncytial virus (RSV, 33.3%) in children less than two years old, adenoviruses (13.0%) in patients 15-34 years old, and influenza viruses (IFVs, 9.6%) in patients ≥65 years. IFVs were the most common virus in outpatients across all age groups (22.7%). After controlling for the confounders caused by other viruses and covariates, adenoviruses (aOR: 3.97, 99% CI: 2.19-7.20) and RSV (aOR: 2.04, 99% CI: 1.34-3.11) were independently associated with increased hospitalization in children, as well as adenoviruses in adults (aOR: 2.14, 99% CI: 1.19-3.85). Additionally, co-infection of RSV with IFVs was associated with increased hospitalization in children (aOR: 12.20, 99% CI: 2.65-56.18).

Conclusions

A substantial proportion of ARI was associated with respiratory viruses in North China. Some specific viral infections or co-infections were more frequent in hospitalized patients than non-hospitalized patients. Attending clinicians should be more vigilant of these infections.
GENOME WIDE SCREENING IDENTIFIED PLATELET FACTOR 4 RESTRICTS THE REPLICATION OF RESPIRATORY SYNCYTIAL VIRUS

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Background and aims

We aimed to unravel the host factors related to RSV replication in a comprehensive way and investigate the antiviral mechanisms of a notable inhibitive factor we characterized.

Methods

With a genome-wide human cDNA library, a gain-of-function screen employing the RSVA2 strain and the Hela cell line were performed to find host proteins affecting viral replication. Pathways and interactions related to RSV host factors were analyzed by bioinformatic tools. Platelet factor 4 (PF4), a strong restriction factor of RSV identified during genome-wide screening was selected. The PF4 antiviral mechanisms were also discussed in vitro and in RSV-infected animal model.

Results

We identified 9 host factors enhancing RSV reproduction and 49 factors with inhibitive effect and uncovered the cellular pathways and protein-protein interactions they involved. In a single-round replication of RSV, only PF4 given no later than viral entry reduced the RNA level of RSV N gene. A heparin dose-dependently rescued RSV replication inhibited by PF4, indicating that anti-RSV function of PF4 was dependent on its activity of binding to heparin and/or heparan sulfate(HS). Confocal microscopy showed that RSV only co-localized with minority of HS but not with PF4, which suggested that PF4 competitive binding HS from RSV. Moreover, the intranasal PF4 treatment significantly reduced RSV loads in lung, alleviated pulmonary pathology and down-regulated airway inflammatory cytokines in RSV infected mice.

Conclusions

Our results provide new clues of host factors involved in RSV infections. PF4 showed to be a strong host restricted factors of RSV infections. PF4 might to be a potential preventative treatment for RSV infection.
HUMAN ADENOVIRUS TYPE 55 INFECTION AMONG PEDIATRIC PATIENTS IN CHINA DURING 2003-2013

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Background and aims

To re-ensure the identification for isolated HAdV strains in previous study.

Methods

HAdV was screened by direct immuno-fluorescence assay (DFA) or virus isolation during 2003 to 2013. DNA was extracted from HAdV positive specimens and hexon, penton and fiber CDS genes were amplified for phylogeny-based classification.

Results

Among these 48800 specimens, 2.6% (1252/48800) were HAdVs positive determined by DFA or virus isolation. Among those HAdV detected, HAdV3 and 7 are predominant HAdV types, and HAdV55 was found in 23 specimens, HAdV14 in 10, and none HAdV11 was found. HAdV 55 was first identified in 2006, and HAdV 14 was in 2011. Nucleotide sequence analysis indicated that HAdV55 is closer to HAdV11p (98.2-98.3% identity) than to HAdV14 (92.4-92.7% identity) based on hexon CDS analysis, closer to HAdV14 than to HAdV11p based on fiber and penton CDS analysis, suggested that HAdV55 was generated by the recombination of HAdV14 and HAdV11p. It is interesting that 90% of the patients infected by HAdV14 were diagnosed as pneumonia (Pn), while 47.4% of the patients infected by HAdV55 were outpatients diagnosed as upper respiratory infections (URI) and 52.6% were inpatients diagnosed as Pn. Most of the inpatients (70%) infected by HAdV55 were reported with lower SAT O2 ranging from 81.1% to 93.5% and the average hospital stay is 15.6 days, suggested that HAdV55 infection cause severe disease in children.

Conclusions

Data from this study indicated that genomic sequencing is important to determine the type of HAdVs and HAdV55 infection can cause severer diseases in children.
A MULTICENTER STUDY OF VIRAL AETIOLOGY OF COMMUNITY-ACQUIRED PNEUMONIA AMONG HOSPITALIZED CHILDREN IN CHINA
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Background and aims

Community-acquired pneumonia (CAP) is a leading cause of childhood mortality and morbidity worldwide, especially in developing countries. However, the aetiology of CAP among children remains little known in China. Here we performed a multicenter study to investigate the feature of viral aetiology of CAP among hospitalized children in China.

Methods

Nasopharyngeal aspirations (NPAs) or throat swabs from children <18 years old with CAP were collected and tested by multiplex RT-PCR for 18 respiratory viruses. Clinical data were systematically collected and analyzed.

Results

From November 2014 to November 2016, a total of 3047 NPAs or throat swabs were collected and screened for viral pathogens using Luminex RVP Fast V2 kit. The median age of the children enrolled was 2.17 years old. The total positive rate of viruses was 55.7% (1698/3047), a viral pathogen was detected in 1184 (38.9%), and two or more viruses in 514 (16.9%). The positive rate among children younger than 6 month of age were the highest (64.6%, 306/474). Enterovirus/Rhinovirus, RSV (RSV A and B), and PIV (PIV1-4) were the most common among children with CAP (23.6%, 15.0% and 8.95%, respectively). There are no statistic difference in positive rate of children with CAP between North China and South China.

Conclusions
Viral pathogens were the most important cause among children with CAP in China. The highest positive rate of virus was detected in children younger than 6 month old. EV/Rh, RSV and PIV were the most common viral pathogens among children with CAP in China.
HUMAN BOCAVIRUS INFECTION AMONG CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA IN CHINA

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Background and aims

Respiratory viruses infection are the leading cause of Community-acquired pneumonia (CAP). Human bocavirus (HBoV) is a parvovirus isolated by Allander in 2005 and has been identified four different genotypes, HBoV1-4. Limited data is available on the prevalence of HBoV infection among children with CAP in China. Here, we performed molecular epidemiological study of HBoV in China between Nov. 2014 and Nov. 2016 and made genomic characterization analyses.

Methods

3047 respiratory samples were collected from children with CAP screening for 18 respiratory viruses, including HBoV and other respiratory viruses, using Luminex xTAG RVP Fast Assay. The HBoV positive samples were amplified for the whole genome using 9 pairs conserved primers. Phylogenetic analysis were performed using complete genome.

Results

HBoV were detected in 263 out of 3047 respiratory samples (8.16%). The HBoV positive rate of <6 month, 6 month-1 years, 1-3 years, 3-6 years and >6 years groups were 8.02%(38/474), 8.29%(34/410), 12.0%(123/988), 4%(32/729) and 3.63%(20/551), respectively. The 1-3y group (12.0%,123/988) showed the higher positive rate of HBoV. Fifty complete genome sequences were obtained from the positive samples, and all of them were belonged to the HBoV1 lineage, and shared the high nuclide acid identification in NS1, NP1 and VP1 (99.6%-100%) .

Conclusions

HBoV1 was the only type detected in our study, implicated that HBoV1 was the most popular type in children with CAP. The children who were younger than 3-year-old groups had the higher infection rate. The NS1, NP1 and VP1 gene of HBoV, circulating among children with CAP in China, showed low amino acid substitutions.
A MULTICENTER STUDY OF HUMAN PARAINFLUENZA VIRUS INFECTIONS AMONG CHILDREN WITH COMMUNITY-ACQUIRED PNEUMONIA

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Background and aims

Human parainfluenza virus (HPIV) is the leading cause for respiratory infections among children younger than 5 years old. We performed a multicenter study for community-acquired pneumonia (CAP) among children.

Methods

During Nov. 2014 and Jun. 2016, 2790 respiratory specimens were collected from children with CAP, and screened for viral pathogens, including HPIV1-4. The clinical data were collected and analyzed.

Results

The total positive rate of the viral pathogen was 55.7% (1553/2790). The positive rate of HPIVs was 8.9% (247/2790), and the positive rate of HPIV1-4 were 1.6%, 1.3%, 5.1%, 1.2%, respectively. Positive rate of HPIVs in 0-6 years old group, 6-12m years old group, 1-3 years old group, 3-6 years old group and >6 years old group were 1.1% (32/2790), 1.5% (43/2790), 3.7% (102/2790), 1.66% (45/2790) and 0.9% (25/2790), respectively (P<0.05). The highest positive rate of HPIVs was in 1-3 years old group. The peak of positive rate was in June in China. There were 8 severe pneumonia cases among HPIVs positive patients. Four cases were single infection of HPIV3.

Conclusions

HPIVs was an important viral pathogen in children with CAP. PIV3 was the most common detected subtype. The highest positive rate of HPIVs was in 1-3 years old children group. HPIVs infection can cause severe pneumonia and severe complications.
ANALYSIS OF CORRELATION BETWEEN AIR POLLUTION AND RESPIRATORY TRACT VIRUS INFECTION
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Background and aims

To investigate the influence of air quality index (AQI), PM25 and PM10 on the occurrence rate of respiratory infections caused by viruses in children in Wuhan.

Methods

Binary logistic regression was used to analyze the correlation between the air pollution index in Wuhan and viral tests results of children with respiratory tract infection in the same period.

Results

Nasopharyngeal secretion of 2650 children with respiratory tract infection in Wuhan area was collected from January 2014 to December 2016. Samples were recorded at the same period as AQI, PM2.5, and PM10. The result showed that every year from December to March was the heaviest period of air pollution in Wuhan area. The average AQI was 110, PM 2.5 was 100ug/m3, and PM10 was 110ug/m3. Annual mean total virus test yield was 17.7%. The detection rate of respiratory syncytial virus (RSV) was 39.7% and that of influenza A and influenza B were 11.95% and 7.2% respectively. During the period with the heaviest air pollution which consisted of 4 months, the total detectable rate of the virus was 24.2% among which the detection rate of RSV was 54.7%. The detection rate of influenza A virus was 11% while the detection rate of influenza B was 21%, the detection rate of RSV and influenza B was positively correlated with AQI, PM2.5 and PM 10.

Conclusions

Air pollution contributes to an increased rate of respiratory viral infections, with RSV and parainfluenza viruses becoming more closely associated with air pollution.
INVASIVE PNEUMOCOCCAL DISEASE (IPD) IN CHILDREN IN PORTUGAL. PROSPECTIVE
STUDY (2008-2016)
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Background and aims

The Portuguese Study Group on IPD conducted a national study in children, in Portugal. The seven-valent pneumococcal conjugate vaccine (PCV7V) was licensed in 2001. PCV10V was introduced in 2009 and PCV13V in 2010 and was included in national immunization program in 2015. The estimated coverage rate was 79% in 2007 and currently is 85%. To analyse the incidence, diagnosis, morbidity and mortality in children with IPD in the last eight years.

Methods

National multicenter study, involving 57 hospitals, between May 2008 and May 2016, including all children <18 years with positive culture or PCR for Streptococcus pneumoniae in sterile body fluids.

Results

A total of 801 cases were identified, with an incidence rate of 35.5:100,000 for children <1 year. Diagnosis were meningitis (15.9%), sepsis (7.2%), pneumonia (51.5%), occult bacteremia (16.7%) and other bacteremia (7.5%). Complications occurred in 35.9% of the children and the mortality rate was 1.4%. Serotypes 3 and 1 were the most frequently detected (22.5%). Over the last years, we observed an emergence of non-vaccine types (34%) and an increase in the proportion (20.2%) of PVC7 types (6B, 14, 19F, 23F) probably related to the decrease in vaccination rates (from 79% to 58%; due to economic problems in the country), before the introduction of the vaccine in the national immunization program.

Conclusions

It is extremely important to enforce the ongoing national surveillance of IPD to observe the impact of universal vaccination and to allow for precise and updated recommendations on vaccination strategies.
MEASLES IMMUNITY IN CHANDIGARH, INDIA
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Background and aims

We conducted a population-based cross-sectional study throughout Chandigarh to better understand population measles susceptibility, and identify reservoirs for measles.

Methods

To date we have interviewed and obtained serum specimens via venipuncture from a population-based systematic random sample of 1249 people (1-60 years old). Serum samples were tested for anti-measles IgG antibodies to determine measles susceptibility.

Results

Low levels of immune protection (87% or lower) were evident in participants 20 years of age or under. Adults ages 41-50 years had the highest protection (96%).

Residents of resettlement colonies (89%) were more likely to be unprotected compared to those from urban areas and villages (92.6 & 92.1% respectively). Likewise, those from scheduled castes and other backward castes (90%) those who identify as Sikhs (89%) and those in the highest incomes brackets, Rs >100,000 per month, (89%) are likely to be negative for IgG antibodies. Among those 20 years age or more those with higher secondary-12 years or less of schooling were least likely to be protected (92%)

Among all participants, 35.5% reported prior measles vaccination and 15% reported history of measles infection. Among the 449 vaccinated persons, 86.6% were protected. Only 62 (13.8%) reported vaccination with more than one dose of measles containing vaccine; and of these 89% were protected.

Conclusions

Most age groups in the population have significant proportions of unprotected individuals; that could act as reservoirs for disease. Even among those vaccinated with one dose of measles containing vaccine (MCV) sero-positivity levels remain low.
MOTHERS, INFANTS AND THE IMPACT OF MEASLES ANTIBODIES IN CHANDIGARH, INIDA

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Background and aims

The recommended age for measles vaccination is 9-12 months in India, based on the assumption that infants are protected by transplacental antibodies until then. A population-based cross-sectional study involving mother-infant dyads was conducted in Chandigarh to understand the impact of the changing dynamic of natural infection versus vaccination on maternal and infant measles antibody levels.

Methods

We interviewed and drew venous blood samples from 240 mother-infant dyads through a systematic random sample procedure. Serum samples were tested for anti-measles IgG antibodies.

Results

Of the 240 mother-infant dyads, 93% of mothers and 93% percent of infants were IgG positive at the time of infant birth. Infants whose mothers had a known history of disease (n=9) had higher seropositivity (100%) compared to infants whose mothers were just vaccinated (80% of n= 20), those who were not vaccinated and did not have disease (96% of n= 130), or who had an unknown disease/vaccination status (91% of n= 81), but these differences were not statistically significant (P=0.0543). There were no significant differences in IgG status at birth by caste, religion, socio-economic status occupation, or education.

Conclusions

The majority of infants are sero-protected at birth; however there is a small minority that lacks protection and is susceptible to the disease well before the age of infant vaccination. It appears that infants of mothers who have antibodies from vaccination are less protected than those whose mothers have natural disease induced antibodies.
The National Center for Disease Control and Public Health (NCDC) in the country of Georgia has been collecting epidemiologic and laboratory data on severe acute respiratory illnesses (SARI) since 2011. The burden of specific pathogens is not well known, and testing for respiratory syncytial virus (RSV) only started in 2014. This study describes the burden of RSV in Georgia and characterizes seasonal and demographic patterns in its incidence among children.
Background: Countries with strong vaccination programs, including the Republic of Korea, have experienced changes in the epidemiology of Japanese encephalitis (JE) with an increase in cases seen in adults. However, the reasons for this increase are not clearly understood. This study describes the change in age specific JE seroprevalence over time in Korea with a view to understand this transition.


Results: Eighteen studies published between 1946 and 2012 were retrieved. In 1946, seropositivity was 51%, 79%, and 94% in the 1–10 year, 11–20 year, and ≥61 year age group, respectively. In the 1970s, seropositivity in children and adolescents was low (10–59%); seropositivity in this group increased to 90-92% in 1984–1985, and further increased to 98% in 2012. Seropositivity among adults aged 41-50 and 51-60 in 2010s ranged between 83.1-97.9 and 77.5-98.3, respectively.

Conclusions: Implementation of the universal JE vaccination program has increased population immunity in Korean children but a proportion of adults remain susceptible. This finding may be useful in informing extended vaccination to adults in the Korea.

A search of EMBASE, MEDLINE, Pubmed, KoreaMed, Korea Education and Research Information Service, and national libraries was conducted using keyword ‘Japanese encephalitis’ combined with ‘Korea’, ‘seroprevalence’, ‘seropositivity’, ‘seroepidemiology’, ‘serosurvey’, ‘immunity’, and ‘antibody’. Data are graphed to present changing seroprevalence by age and years. The literature search and evaluation were conducted according to the preferred reporting items of systematic reviews and meta-analyses (PRISMA) guideline.

Eighteen studies in English and Korean languages published between 1946 and 2012 were retrieved. The seropositivity for the 0-20 year age group increased from 65% in 1946 to 98% in 2012. The seropositivity for ≥ 21 year old age group decreased from 92% in 1946 to 83% in 2012.

The results indicate that implementation of the universal JE vaccination program for children in 1985 has increased their population immunity. This somewhat explained the shift in JE cases toward adult population. This finding may be useful in informing countries that plan to implement JE vaccination in their public health program.
THE PREVALENCE OF POSITIVE INTERFERON GAMMA RELEASE ASSAY RESULTS IN REFUGEE CHILDREN ATTENDING A SPECIALIST HEALTH CLINIC IN SYDNEY

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Background and aims

Australia accepts over 13,000 refugees annually. Our state health department guidelines recommend screening refugee children older than 2 years who are from countries with prevalence of tuberculosis >40 per 100,000. However, the Health Assessment for Refugee Kids clinic at The Children’s Hospital at Westmead screens all referred refugee and asylum seeker children regardless of age or country of birth. We sought to determine the frequency of positive interferon gamma release assay (IGRA) results and the characteristics of children testing positive.

Methods

We retrospectively analysed all tuberculosis screening data for all new referrals to the clinic between January 1st 2014 and December 31st 2015. The clinic used IGRA screens for tuberculosis. We extracted data from our electronic medical record system, including: IGRA result; the child’s country of birth; language; ethnicity; transit countries; mode of travel; stay in refugee camp or detention centre and tuberculosis contacts.

Results

There were 235 children with IGRA tests performed, of whom 28 (12%) were positive, 203 (86%) were negative and 4 were invalid. Of 68 children younger than five years, seven (10.3%) returned a positive IGRA result. Two were younger than two years old. Of children with positive IGRA tests, 11/28 (39%) originated from countries with TB prevalence <40 per 100,000. IGRA positivity was not associated with other factors.

Conclusions

We identified several children who would have been missed by our current state refugee screening practices. These children could be at risk of progression, particularly those younger than two years of age.
Background and aims

The carriage rate of *Streptococcus pneumoniae* is an important factor since it determines the development of the disease as well as the spread of the pathogen between individuals. Since 2011, the 13 valent pneumococcal conjugate vaccine (PCV13) has routinely been used for infants in Turkey with a 3+1 schedule. There is a lack of nationwide data in Turkey on pneumococcal carriage in adolescents before or after routine PCV vaccination. The objective of this study was to determine the age-specific prevalence of *S. pneumoniae* carriage in adolescents and young adults.

Methods

This is a nationwide multicenter study performed in 12 different cities of Turkey. 1518 adolescents and young adults aged between 10 and 24 years were enrolled. Presence of *S. pneumoniae* DNA was detected using the polymerase chain reaction assay.

Results

The overall pneumococcal carriage rate was 10.7%. The highest carriage rate was detected in 11 year-old population (17.4%). Carriage rate was 14% in 10-14 years age group, 11.6% in 15-17 years age group, 6.1% in 18-20 years age group and 9.1% in 21-24 years age group (p<0.01). Pneumococcal carriage rate was not found to be associated with educational status, living in a dormitory or student house, presence of household contacts with meningitis history, smoking and attendance to bars/clubs (p>0.05).

Conclusions

Nasopharyngeal carriage rate was 10.7% among unvaccinated adolescents and young adults in Turkey and inversely correlated with age. Carriage rate was found to be lower than the limited
number of pre-PCV infant program studies. Catch-up vaccination strategies may be needed for the adolescents with high-risk conditions for invasive pneumococcal disease.
EVALUATION OF PNEUMOCOCCAL SEROTYPE 19A FROM PRE-PCV10 ERA USING MLST AND ANTIMICROBIAL RESISTANCE TO PREDICT POST-PCV10 ERA TRENDS

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Evidence on cross-protection of Pneumococcal Conjugate Vaccine (PCV10), introduced in Bangladesh in 2015, against serotype 19A is inconclusive. Certain sequence types (ST) of 19A caused replacement disease after PCV7 introduction, which also does not protect against 19A. In Bangladesh, 19A is uncommon in IPD but often isolated from otitis media (OM) and carriage specimens. To assess possible 19A replacement disease, we characterized 19A isolates from different sources.

Whole genome sequencing was performed on 19A isolates from IPD (N=15), OM (N=18) and carriage (N=17). STs, identified through MLST, were grouped into clonal complexes (CCs). Antibiotic susceptibility patterns were determined; resistance genes were detected using bioinformatics.

Five CCs with 23 STs were identified; 13 STs were novel. STs differed in IPD, OM and carriage; only two OM STs were found in IPD cases. Of 23 STs, 47.8% showed resistance to ≥3 antibiotics (MDR), two to two antibiotics, eight to one; two STs were pan-sensitive. Of 50 isolates, 54% were MDR (cotrimoxazole, tetracycline and erythromycin-resistant), which consisted of 11 STs (847, 1553, 2013, 2464, 2988, 7682, 12473 and four novel) and harbored tetM and ermB or mef genes and Tn916 gene family, indicating macrolide resistance.

We did not detect ST320, MDR 19A ST that frequently causes replacement disease. However, other MDR STs may emerge, although MDR STs were mostly isolated from OM, indicating possible low invasiveness. With high burden of IPD and ongoing surveillances, Bangladesh can monitor trends of 19A and resolve debates on replacement and cross-protection by PCV10.
Background and aims

Salmonella enterica serovar Typhi (S. Typhi) inflicts a significant burden in Kano, a densely populated city in Northern Nigeria. We propose to characterize S. Typhi geospatial distribution in children.

Methods

From January 2014 through April 2017, 12,493 febrile children less than 5 years of age were enrolled into a study of invasive bacterial diseases. Blood was cultured by automated Bactec® incubator; households of 204 cases and 209 controls were geo-located using ArcGIS®.

Results

The monthly incidence rate of 914 S. Typhi isolates varied between 2.9% and 17.2%. The mean incidence rate was 7.2 %, 99% CI [5.64%, 8.75%]. Using the upper limit of the confidence interval as the endemic threshold, there were two outbreaks or hyper-endemic periods. In the first hyper-endemic period, geolocation displayed case clustering in areas similar to those found during below endemic threshold times in the central and Southwestern area of the city (Fig.1). In contrast, during the second
period, cases clustered in the South (Fig. 2).

Conclusions

Geolocation of S. Typhi cases reveals cases spread throughout the city with high burden regions. Mapping of cases can aid targeted high priority vaccine roll-out and/or water and sanitation improvement areas.
Background and aims

To know the immunity against measles among healthy infants and children in Shenzhen by the detection of their measles antibody IgG level, and to provide the references and evidences for making measles control and vaccination strategy scientifically.

Methods

In 2016-2017, with sampling surveys, 800 individuals in the population accepted health checking in Shenzhen Children’s Hospital were selected, and their serum measles antibody IgG levels were detected by ELISA quantitative assay, the results were analyzed by age group.

Results

The results showed that the positive rate of measles antibody was 81.5%, and the GMT (Geometric mean titer) was 86.3IU/ml. No statistically significant difference was found in the positive rate of measles antibody between gender (P >0.05), statistically significant difference was found in the positive rate and GMTs of measles antibody, among age (P <0.01). The positive rates and GMTs of the group less than 8 months and the group exceed 10 years are relatively lower than others.

Conclusions

The measles antibody level is high in the healthy population of infants and children in Shenzhen, so the probability of measles outbreak is very small in recent years, but the immunity against measles in very young infants and elder children deserves further attention and enhancement.
Background and aims

The aim of the study was to assess the epidemiological characteristics and genotypes of measles virus isolated from 63 patients with measles in Shenzhen City between 2016 and 2017.

Methods

Reverse transcription—polymerase chain reaction (RT—PCR) was used to examine throat swab samples of measles patients with positive measles IgM antibody. A 499-nucleotide fragment at the COOH end of measles virus N gene were amplified and purified for sequencing. MEGA 5.03 was used for genetic analysis.

Results

Among the 63 measles cases, the number of genotyped cases were 63, respectively. RT—PCR revealed a total of 35 positive strains, and all of the strains were subtype H1a. Gene sequencing results showed that the virulent strains contain two main transmission chains, with an average nucleotide mutation of 0%—2.0% (0—10 bp of nucleotide difference). The variance between the 35 virulent strains and the Chin93-2/H1a reference strain ranged between 1.36% to 1.93% (7—10 bp of nucleotide difference), and that between the virulent strains and the S191 vaccine strain was 6.98% to 7.75% (36—40 bp of nucleotide difference).

Conclusions

Subtype H1a is the dominant virulent strain of measles virus in Shenzhen in recent years, and the strains were minor in genetic variation and highly homologous.
Background and aims: Chickenpox, scarlet fever (SF) and hand, foot, and mouth disease (HFMD) mainly infect young children and cause considerable healthcare and societal burdens. This study compared and examined parental knowledge and information sources related to these three diseases.

Methods: Three independent surveys were conducted covering 605, 609 and 618 parents, each with at least one child aged ≤12 years, for surveys of chickenpox, SF and HFMD, respectively, using randomly dialed telephone interview. Descriptive analyses calculated proportions for knowledge and information sources while multivariate logistic regression models examined the adjusted associations between knowledge and information sources.

Results: Of the participants, 92.1%, 55.5% and 74.3% identified the typical symptoms, while 71.2%, 78.0% and 86.7% identified the major transmission modes of chickenpox, SF, and HFMD, respectively. However, only 13.2% and 28.8%, respectively, knew the peak seasons of chickenpox and HFMD. Parents were more likely to obtained chickenpox-related information from healthcare workers and family/relatives, SF-related information from newspaper/magazine, and HFMD-related information from TV/radio, school and government websites. Obtaining information from TV/radio was associated with knowledge of chickenpox transmission (OR=1.62) and SF symptoms (OR=1.44); from school with knowledge of SF symptom (OR=1.94) and transmission (OR=2.71); from healthcare workers (OR=2.13) with knowledge of HFMD symptoms, and from government websites with knowledge of HFMD transmission (OR=1.78).

Conclusions: Parental knowledge about disease peak seasons was poor. Information on these common pediatric infections seems fragmented. An effective communication tool should be developed to provide comprehensive information about common pediatric infections for parents.

Key words: pediatric infectious disease; knowledge; information source; parent
A population-based active surveillance of Rotavirus gastroenteritis (RVGE) in young children in rural Guangxi, China

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Background and aims

Rotavirus gastroenteritis is an important global public health concern for children < 5 years of age. However, there is scarce data from population-based studies assessing the epidemiology of Rotavirus Gastroenteritis (RVGE) in rural China.

Methods

From November 2012 to March 2014, prospective rotavirus surveillance was conducted in a catchment area of 26 village clinics and 4 township/county hospitals. Children < 5 years of age presenting with acute gastroenteritis (AGE) of < 72 hours duration were enrolled. Stool samples were first tested for rotavirus by EIA and the VP7 type was determined by RT-polymerase chain reaction for rotavirus-positive samples.

Results

1826 AGE cases were enrolled. Among 1780 patients with a stool sample, the rotavirus detection rate was 38.2% in the 2012-2013 season and 13.9% in the 2013-2014 season and peaked in Jan 2013 (58.2%). The overall RVGE attack rate (AR) was 5.9% (95% CI: 5.2, 6.7), and 3.4% (95% CI: 2.8, 4.1) in the 2012-2013 season and 2013-2014 season, respectively. The highest AR was found in children <12m of age, 12.5% and 7.1% respectively in the two seasons. Severe cases had greater likelihood of being RV+ than mild/moderate cases (44.1% vs 26.4%). G9P[8] was dominant in 2012-2013 season (50.6%), and G1P[8] was dominant in 2013-2014 season (73.6%).

Conclusions

This active population-based surveillance study demonstrated that RVGE is associated with a high attack rate and significant proportion of seasonal AGE cases especially in children < 12m of age in the rural Guangxi, China.
NASOPHARYNGEAL CARRIAGE RATE, SEROTYPE DISTRIBUTION, ANTIBIOTIC RESISTANCE PATTERN OF STREPTOCOCCUS PNEUMONIAE ISOLATED FROM HOSPITALIZED CHILDREN WITH LOWER RESPIRATORY TRACT INFECTIONS IN JINAN
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Background and aims

To evaluate the relationship between wheezing and bacteria colonization/infection in children with lower respiratory infection younger than 3 years.

Methods

The isolates were collected from 206 patients with lower airway infection from June 2014 to June 2015. All the patients were classified into wheezing (135 cases) and non-wheezing (71 cases) groups according to the symptom and sign of wheezing.

Results

Sixty-four patients (31.1%) showed positive culture result and 70 isolates were collected in this study. The top three bacterial collected were Streptococcus pneumoniae (31/70, 44.3%), Escherichia coli (12/70, 17.1%) and Klebsiella pneumoniae (10/70, 14.3%). The total detection rate of bacteria had no significance between two groups (χ²=2.568, p=0.109). However, the carry rate of Streptococcus pneumoniae was higher in wheezing group than that of non-wheezing group (χ²=5.432, p=0.02).

Conclusions

The characteristic of nasopharyngeal bacterial distribution is different between the children with wheezing and without wheezing. The colonization/infection of Streptococcus pneumoniae in children may contribute to the occurring of wheeze and the mechanism is not clear yet.
RESPIRATORY SYNCYTIAL VIRUS SEASONALITY IN SUBTROPICAL AUSTRALIA

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Background and aims

Respiratory syncytial virus (RSV) is a major cause of morbidity and mortality in children worldwide. There is emerging evidence that meteorological factors influence annual RSV epidemics. Although RSV seasonality has been studied in various climates, there are limited data for subtropical regions, especially in the southern hemisphere.

Methods

We employed a retrospective, analytical time-series study using multiple data sources for the Gold Coast region of South-East Queensland, Australia (latitude 28° South). RSV cases in children aged <5-years were identified from the Pathology Queensland Gold Coast Laboratory database between July 1st 2007 and June 30, 2016. Corresponding local meteorological data (daily maximum temperature, daily minimum temperature, rainfall, relative humidity, dew point, solar radiation) were collected from the Australian Bureau of Meteorology. Data were decomposed into annual trend and quarterly seasonal patterns using 52-week and 13-week moving averages respectively. Seasonal associations between RSV incidence and meteorological data were assessed using cross-correlations, and associations were assessed using pairwise correlation at points of maximum cross-correlation.

Results

Peak RSV activity occurred usually in autumn (March-May), tapering in winter. The highest percentage was in April with 31% of all swabs taken positive for RSV. Metrological variables were associated with RSV incidence. In particular incidence was strongly correlated with rainfall 6 weeks earlier (rho=0.43).

Conclusions

Identifying meteorological conditions associated with seasonal RSV epidemics can improve understanding of virus transmission and assist in planning for their impact upon the health sector, including timing of palivizumab for high-risk infants and maternal administration of candidate RSV vaccines.
A COMPARISON OF METHODS FOR EVALUATING THE IMPACT OF PNEUMOCOCCAL CONJUGATE VACCINE IMPACT IN FIJI

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Background and aims

The World Health Organization has recommended worldwide introduction of pneumococcal conjugate vaccines (PCV) into immunisation programs to prevent pneumonia. Observational post-licensure studies have shown reductions in hospitalised all-cause childhood pneumonia following PCV introduction. However, estimates of vaccine impact vary widely across studies due to factors including case definitions, hospital admission criteria, baseline disease incidence and PCV coverage. Importantly, the methods used to assess vaccine impact also vary across studies. In this study, we compare statistical methods for evaluating PCV impact on hospitalised pneumonia using data from Fiji, and illustrate the sensitivity of results to the methods used.

Methods

This study used administrative hospitalisation data for children <2 years from Fiji, which introduced the 10-valent PCV in 2012. The outcome variable was hospitalisation for all-cause pneumonia, as determined by primary discharge diagnoses using ICD-10-AM codes. Data from 2007-2015 were extracted from the national hospital admission database and were analysed using the most common methods from the PCV impact literature.

Results

Preliminary results of pre- versus post-vaccine comparisons indicate reductions in incidence of pneumonia hospitalisations in children <1 year (Incidence rate ratio (IRR) 0.76; 95% CI: 0.69, 0.83). Smaller annual reductions were seen with interrupted time series analyses (IRR 0.98; 95% CI: 0.97, 0.99). We observed varying estimates of PCV impact depending on the analysis approach and effect measures used (e.g. IRR, model-based predictions of cases prevented).

Conclusions

To enable comparison across studies and to inform policy-makers considering PCV introduction, clearer guidelines are needed for the analysis and reporting of vaccine impact.
Background and aims

Glucocorticoids (GCs) are first-line drugs for asthma treatment. However, large numbers of asthma patients still suffer from airway hyperresponsiveness (AHR) despite regular treatment with GCs. GCs can change the proportions of airway inflammatory cells and may work against airway epithelial integrity in asthma. We suppose that airway inflammatory alteration and airway epithelial injury might lead to AHR, weakening the treatment of GCs on asthma. The present study was aimed to investigate the correlations among airway inflammation, airway epithelial injury and AHR in asthma treated with GCs.

Methods

Female BALB/c mice were sensitized with ovalbumin on days 0, 7, and 14, challenged with ovalbumin starting on day 21 for 10 days and treated with dexamethasone (0, 1 or 5 mg/kg) starting on day 28 for 3 days. After the final challenge, we measured AHR and differential cell counts in the broncho-alveolar lavage fluids, and analyzed the correlations.

Results

We found that Penh 50 (an indicator of AHR) had positive correlations with airway neutrophils and shed airway epithelial cells, but no correlation with eosinophils, lymphocytes, or macrophages. We also found that shed airway epithelial cells had positive correlations with airway neutrophils, but no correlation with eosinophils, lymphocytes or macrophages.

Conclusions

Our findings suggest that airway neutrophils and excessive shedding of airway epithelial cells (but not eosinophils or lymphocytes or macrophages) might be involved in AHR in asthma treated with GCs.
NASAL SWAB BACTERIOLOGY BY PCR DURING THE FIRST 24-MONTHS OF LIFE IN THE PROSPECTIVE ORCHID COHORT STUDY

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Background and aims

Most paediatric carriage studies are based on cross-sectional samplings or longitudinal studies with relatively sparse sampling points. In the Observational Research in Childhood Infectious Diseases (ORChID) study, weekly nasal swabs were collected to evaluate viral and bacterial epidemiology in infants and children. Here we report the bacteriological findings.

Methods

The ORChID study was a prospective birth cohort study conducted in 2010-2014 to document the community-based epidemiology of respiratory infections in infants living in Brisbane, Australia. Pregnant women were recruited, and their healthy newborns were followed for the first 2-years of life. Parents kept a daily symptom diary for their study child, collected a weekly anterior nose swab and completed a burden diary when a child met pre-defined illness criteria. Specimens were tested for bacteria by real-time PCR assays.

Results

Altogether 11195 (68% of the maximum expected) nasal swab samples from 158 enrolled children were analysed. *Bordetella pertussis*, *B. parapertussis*, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae* and *Simkania negevensis* were very infrequently or not at all detected by PCR. However, *Streptococcus pneumoniae*, *Moraxella catarrhalis*, and *Haemophilus influenzae* were detected in 42.1%, 38.5%, and 14.6% of high-quality samples, respectively. Concomitant detection of these bacteria was common. The prevalence increased with age and was more common in the winter months. Presence of siblings and day-care attendance were the most important risk factors.

Conclusions

The feasibility of frequent nasal swabbing by parents for bacterial carriage was confirmed in this study. PCR detected the major respiratory tract bacteria with expected high frequencies, but atypical bacteria were identified rarely.
PREVENTION AND KNOWLEDGE ABOUT ZIKA VIRUS AMONG PREGNANT WOMEN AND NEW MOTHERS OF THE COHORT ZIKA-JUNDIAI

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Rationale: Zika Virus (ZIKV) infection is an emergent disease that raised international public health concern in 2016. Vector transmission associated with factors such as globalization, urbanization, climatic changes and increasing outbreaks of mosquitoes contribute to the rapid dissemination of the virus, while vertical and sexual transmission add new difficulties to epidemiological control. No current treatment or vaccine to ZIKV is available yet, magnifying the importance of prophylaxis for disease control. Preventive measures include vector control and personal protection, such as the use of repellents, insecticides, condoms, and mosquito nets. Educational efforts aiming to increase the awareness of the general population on preventive measures against the infection play a critical role in the effectiveness of public health policies for disease monitoring and control. Methods: We conducted a quantitative study with pregnant women and recent mothers of the Cohort Zika Jundiai to evaluate the knowledge and prevention habits of these women concerning ZIKAV infection. Results: Among the 279 women interviewed, knowledge about sexual, transplacental and mosquito transmission was reported by 39.4%, 40.9%, and 69.1% participants, respectively. Mosquito repellents were used by 48% women while only 15.4% reported regular use of condoms. Conclusions: We detected low levels of knowledge about sexual and transplacental transmission, as well as underuse of protection measures against ZIKV infection in this sample of pregnant women and recent mothers, which may impact on the transmission of the infection amongst this population.
The spread of Zika virus infection has only recently been acknowledged in Brazil. On May 2016, the World Health Organization (WHO) reported the occurrence of 1271 cases of microcephaly and other malformations in newborns or fetuses in Brazil, presumably associated with Zika virus infection. A technical note of the Brazilian Association of Collective Health (ABRASCO) on February 2016 emphasized the importance of urban and sanitation policies to promote the resolution of housing, sanitation and urbanization problems and pointed out that environmental sanitation measures should be prioritized in the combat against the vector. This study aimed to evaluate the peri domicile situation of 193 pregnant women included in the Zika cohort study in Jundiai, SP, Brazil. Students from the School of Technology of Sao Paulo (FATEC) visited the houses from December 2016 to June 2017 looking for unfavorable conditions that allowed Aedes aegypti replication. The presence of any of the following conditions was registered: culverts and manholes in the street; sewer and treated water; garbage destination; condition of parks, gardens and empty lots on the street. Preliminary results indicate that the presence of manholes to allow proper drainage of rainwater is a protective factor against Aedes aegypti replic (p=0.003). These preliminary findings point to the importance of public health and sanitation policies to control this emerging disease.

Support: The London School of Hygiene & Tropical Medicine and FAPESP

References


MOLECULAR CHARACTERIZATION RESEARCH OF MYCOPLASMA PNEUMONIAE STRAINS ISOLATED FROM MYCOPLASMA PNEUMONIA OUTBREAK IN 2016, KUNMING, YUNNAN

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Background and aims

Mycoplasma pneumoniae (MP) is a cell wall-less microbe which can grow in cell-free condition in nature, and it transmits from person to person via cough. MP is particularly prevalent in low immunity school age children and cause mycoplasma pneumonia.

Methods

Bronchoalveolar lavage fluids of pediatric mycoplasma pneumonia patients were collected and cultured in improved MP media. The culture mixture was applied with antibiotic susceptibility test including quinolones antibiotic and macrolide antibiotic. Meanwhile, MP DNA was extracted from the culture followed by gene sequencing. Then, MP strains were molecular typed, and partial P1 gene (repMP2/3 and repMP4) sequences in the study was compared to 23 MP strains gene in GenBank using multiple alignments.

Results

One (MP5) from 20 MP strains showed resistant for almost 4/5 kinds of quinolones antibiotic and 3/4 macrolide antibiotic. MP strains isolated this time contained two P1 types in which MP5 belonged to P1 type II, and other strains were P1 type I. Some mutation sites and fragments were detected in MP5 and other Japanese MP strains on same site. A special fragment concluding 29 site mutations in two strains (MP1 and MP7) was not detected in all MP P1 gene in GenBank.

Conclusions

In conclusion, P1 type I was mainly epidemic type in 2016, Kunming, Yunnan, and P1 type II strains were probably incoming from Japan. MP gene changed dramatically compared to other MP strains all around the world. Our study monitors the prevalence of MP in Kunming, and provides the basis for forecasting for MP epidemic tendency in future.
Background and aims

Typhoid fever, caused by Salmonella enterica serovar Typhi (S.Typhi) is responsible for approximately 222,000 deaths worldwide annually out of an estimated 21 million cases. Invasive non-typhoidal Salmonella (iNTS) infections account for another estimated 3.4 million cases annually. Both are largely attributed to poor sanitation and lack of clean drinking water. In Nigeria, Salmonellae are a leading cause of bacteremia in children aged less than 5 years. We propose to survey environmental risk factors that may predispose to Salmonellae infection.

Methods

Caregivers of febrile children aged less than 5 years enrolled in a bacterial surveillance platform in Kano, Nigeria completed environmental household surveys between September of 2015 and April of 2017.

Results

Of 6,632 children, 980 (14.78%) had a positive blood culture. Of these 408 (41.63%) were S. Typhi and 175 (17.86%) were iNTS infections. 4409 (66.5%) reported using WHO defined improved sources of drinking water and 6056 (91.3%) reported using WHO defined improved types of toilets.

Cases of S.Typhi were significantly higher in the children of households using improved toilets (6.31%) versus children living with unimproved toilets (3.89%) (P = 0.049).

iNTS cases were significantly higher in the children of households using improved water sources (3.04%) compared to those with unimproved water sources (1.99%) (P = 0.0157).

Conclusions

In this population, improved water source and sanitation showed limited improvement in Salmonellae infections. Routine environmental surveillance of potential sources of infection is necessary in endemic settings to better inform public health interventions.

Acknowledgments: Funded by Gates Foundation (Obaro OPP1034619)
Understanding causes of hospitalization in infants is necessary for structuring and planning public health resources. Most hospitalized children are infants under one year of age. There are few recent studies on the epidemiology of these hospitalizations in Brazil. The objective of this cross-sectional study is to analyze causes of hospitalizations in children under one year of age in 2015, in a general pediatric ward.

Retrospective medical records review of infants ≤ 12 months old hospitalized in Hospital Universitário da Universidade de São Paulo, an urban teaching hospital located in São Paulo city, Southeast of Brazil, in 2015. We collected data of the leading causes of hospitalization and etiology.

In 2015, a total of 1629 patients between 0 and 15 years old were admitted to our pediatric ward; 34.9% (n=569) were under one year of age. Among infants under one-year-old, the male: female ratio was 1.5:1. The median length of stay was 4 days. Respiratory diseases were the major causes of hospitalization (75%). Bronchiolitis accounted for the majority of admissions (36.7%), followed by pneumonia (11.6%). Respiratory syncytial virus (RSV) was the main etiology, identified in 134 cases of bronchiolitis (64.1%)

Fig-1: Causes of Hospitalization in infants under one-year-old in Hospital Universitário de São Paulo, Brazil.

Bronchiolitis due to RSV is the leading cause of hospitalizations during the first year of life.
COMMUNITY KEY INFORMANTS – CAN WE IMPROVE INFORMATION ON PREGNANCY AND BIRTH?

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Background and aims

WHO recommends three home visits after birth to reduce neonatal mortality. To conduct home visits, information of birth must be transmitted to health care providers. Within a randomised trial assessing the effect of delivering vaccines at a home visit, we investigated the effect of introducing community key informants (CKIs) on timeliness and completeness of information.

Methods

In Bandim Health Project’s (BHP) rural Health and Demographic Surveillance System with two-monthly village visits, we randomised 35 village clusters to transmission of information on pregnancy and birth through maternal report +/- CKIs. Births were reported to the study supervisor through phone calls from mothers/CKIs.

Results

Performance of CKIs varied. Between May 5, 2016 and March 1, 2017, 260 pregnancies were registered in villages with CKIs. The CKIs captured 105 (40%) pregnancies before registration by BHP-staff. Median time from registration to birth was longer in CKI villages (p=0.001, Table). Among 636 registered births, information was obtained within 24 hours for 187 children (49%) in CKI villages, whereas only 52 births (20%) were reported within 24 hours by mothers in non-CKI villages (Table).

Table: Information on pregnancy and births

<table>
<thead>
<tr>
<th></th>
<th>CKI villages</th>
<th>No CKI villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy registration to birth interval: days – median (IQR)</td>
<td>115 (80-155)</td>
<td>103 (64-138)</td>
</tr>
<tr>
<td>Information on birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;24 hours</td>
<td>187 (49.5%)</td>
<td>52 (20%)</td>
</tr>
<tr>
<td>24-72 hours</td>
<td>36 (9.5%)</td>
<td>16 (6%)</td>
</tr>
<tr>
<td>&gt;72 hours</td>
<td>155 (41%)</td>
<td>191 (74%)</td>
</tr>
</tbody>
</table>

Conclusions

CKIs improved the timeliness of information on pregnancies and births. CKIs can be used as a source of information. However, obtaining information from CKIs is not a self-propelled system.
PRELIMINARY ASSOCIATIONS BETWEEN SOCIOECONOMIC STATUS AND VACCINE HESITANCY IN SHANGHAI, CHINA

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Background and aims

Vaccine hesitancy has been predominantly studied in developed countries, and it is unclear what patterns may emerge in developing countries, like China. Using a vaccine hesitancy scale developed by Larson et al., the aim of this study was to describe vaccine hesitancy in Shanghai, China, and compare this hesitancy between locals and non-locals, i.e. migrants into the city whose residency card, or hukou, was from another province.

Methods

Mothers and fathers of young infants <3 months were enrolled into this cross-sectional study from immunization clinics throughout Shanghai. They responded to a 10-item vaccine hesitancy scale. To date, 210 individuals have been interviewed. A linear regression model assessed the significance of predictors of vaccine hesitancy.

Results

In this preliminary sample, an exploratory factor analysis revealed a potential two-factor structure, but overall internal consistency of the 10-item scale was adequate (α=0.72). The average score was 1.85. We did not find a significant difference between Shanghai locals and non-local parents with a non-rural or rural hukou. Compared to individuals with a high school education, those with a graduate degree had 0.19 points higher vaccine hesitancy (95% CI: 0.11, 0.27), and those with a history of contracting a vaccine-preventable disease had 0.06 fewer points (95% CI: -0.11, -0.02).

Conclusions

In general, these parents from Shanghai, China, had confidence in the vaccination program. Similar to in the United States, we found evidence that certain groups with high socioeconomic status, like those with a graduate degree, had greater hesitancy than those with lower education.
Background and aims

To study the clinical features and treatment of children with influenza, and provide evidence for clinical screening and appropriate treatment timely.

Methods

Epidemiology, clinical manifestations, laboratory features and drug therapy of 978 pediatric patients with influenza in Beijing New Century International Children’s Hospital in 2014 were analyzed retrospectively.

Results

Among the 978 pediatric patients with influenza, 90.8% were outpatients, while 9.92% were inpatients. The incidence was highest in winter (85.28%). The age of most cases ranged from 1 to 5 years old (57.16%). The cases with type A influenza accounted for 81.29%. High fever (99.59%) and cough (85.89%) were the two main symptoms. The average count of WBC was $6.86 \pm 2.68 \times 10^9/L$, lymphocyte percentage was lower than the proportion of neutrophils. CRP was normal (66.16%) or slightly increased (19.00 ± 15.12 mg/l). Compared with type A influenza, digestive tract symptoms were more common in cases with type B ($P = 0.000$). Analysis of 97 hospitalized cases: the mainly diagnosis was lower respiratory tract infection (71.13%). Nearly 23.71% cases had been detected with combination of other pathogenic infections. Course of fever in cases who started taking oseltamivir after fever of 48 hours was significantly longer than those who took within 48 hours ($P = 0.000$). Seven severe pneumonia cases were mainly in young children, cases with primary disease or mixed infection, they were all cured by actively comprehensive therapy.

Conclusions

Influenza in children is characterized by high fever and cough, digestive tract symptoms are frequently occurred in patients with type B influenza. Early application of oseltamivir can obviously shorten the period of fever. Severe cases should be given actively comprehensive treatments.
RUBELLA SEROPREVALENCE AMONG CHINESE PREGNANT WOMEN
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Background and aims

Rubella infection in pregnant women can result in serious effects, however, the rubella seroprevalence among pregnant women in China is largely unknown.

Methods

From June 2016 through March 2017, 324 blood samples were collected from pregnant women in Beijing. Rubella-specific IgG antibody was determined by ELISA (Euroimmun, Lübeck, Germany) kits.

Results

In all involved pregnant women, the proportions of negative (<8 IU/ml), equivocal (8-<11 IU/ml) and positive (≥11 IU/ml) anti-rubella IgG were 11.7% (95% CI: 8.7%-15.7%), 5.9% (95% CI: 3.8%-9.0%) and 82.4% (95% CI: 77.9%-86.1%), respectively. The seropositivity of pregnant women in 17-26 years group, 27-36 years group and 37-46 year group were 83.0% (95% CI: 74.1%-89.2%), 81.3% (95% CI: 74.1%-86.8%) and 83.7% (95% CI: 74.5%-90.0%), respectively. No significant difference in seropositivity rates among the three age groups was found (P=0.99). The unprotected individuals as defined by anti-rubella IgG <10 IU/ml were indentified in 16.7% (95% CI: 13.0%-21.1%) of the tested pregnant women.

Conclusions

Despite low vaccination coverage for rubella, most of Chinese pregnant women had potent rubella immunity. However, at least 16.7% of pregnant women were susceptible to rubella, which suggested RCV or MMR immunization in Chinese women at child-bearing age.
GENETIC VARIABILITY OF HUMAN RESPIRATORY SYNCYTIAL VIRUS IN CHONGQING FROM 2009 TO 2016

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Background and aims

To investigate the prevalence and Genetic variability of RSV in Chongqing from 2009 to 2017.

Methods

We collected nasopharyngeal aspirates (NPAs) from hospitalized infants or children with acute lower respiratory tract infections from the Department of Respiratory Medicine from 2009-2016.

Results

Nearly 11,000 NPAs were collected from June 2009 to May 2016. 16 respiratory viruses detection were performed in 5,980 NPAs, RSV was detected in 1,981 (33.13%) NPAs. RSV-A were identified in 1098 (18.36%) NPAs, RSV-B identified in 858 (14.35%) NPAs, 25 (0.4%) detected both RSV-A and RSV-B. There are four shifts of RSV subtypes in Chongqing at 2010, 2012, 2014, 2016. Children infected with RSV-A tended to develop to more severe disease (P=0.022). ON1 has become the predominated genotype prevailed in Chongqing, and the incidence of respiratory failure in patients with ON1 genotype was much higher than that in patients with NA1 genotype. BA genotypes predominated in 2009–2010, whereas the GB5 genotype outbreak was prominent in 2010–2011. The BA9 genotype replaced the non-BA genotype to become dominant from 2011 to 2013. While the prevalent genotype of RSV-B in Chongqing was BA12 (51.4%) from 2013 to 2016. The incidences of fever and respiratory failure in children with BA2 genotype were significantly higher than those of BA9 (P <0.001)

Conclusions

The shifting pattern of RSV subtypes is AABBAABB in Chongqing from 2009 to 2016. RSV genotypes were disseminated with positive selection pressures, and different genotypes of RSV lead to different disease severity.
Background and aims

To study the therapeutic effect of CES - TMS on children's attention deficit hyperactivity disorder (ADHD).

Methods

50 cases of conform to the ds-m-v - V diagnosis of children with ADHD treatment with CES, and chooses the neuropsychological gauge to measure it, mainly for ADHD rating scale - V (parent edition), CONNERS parents questionnaire - Jane version.

Results

50 children with ADHD were more than 7, more impulsive than normal, 4. All children were compared before and after a course of treatment. The two scales were treated 8 times and 16 times assessed. The scores were significantly reduced by P (0.05), and the attention concentration of children with ADHD was significantly reduced after the treatment of CES.

Conclusions

There are different improvements in attention and adhd after cces. It is advisable to gradually reduce the number of treatments with one course of treatment.
MODELING THE PUBLIC HEALTH IMPACT OF FINLAND SWITCHING FROM 10-VALENT (PCV10) TO 13-VALENT (PCV13) INFANT PNEUMOCOCCAL CONJUGATE VACCINATION

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Background and aims

PCV10 has exclusively been the pneumococcal vaccine in the infant national immunization program (NIP) in Finland since 2010 following the FinIP placebo controlled efficacy study. The NIP has shown reductions in IPD due to the 10 serotypes contained in the vaccine in children. However, there has also been a steady increase in IPD caused by serotypes not contained in the vaccine in children and the elderly, specifically 3 and 19A which are included in PCV13 but not PCV10.

Methods

A forecasting model was developed to estimate public health impact of switching infant vaccination from PCV10 to PCV13. Epidemiologic data was obtained from the Finnish National Institute for Health and Welfare (THL) to estimate serotype-specific IPD trends and forecast future disease with PCV10 compared to predicted incidence with PCV13 based on serotype trends from the UK.

Results

Conservatively assuming IPD incidence is constrained to pre-PCV levels, switching to PCV13 was estimated to prevent 755 more cases of IPD and 54 associated deaths compared to continued use of PCV10 over 5 years (Figure 1). If rates of IPD continue to rise in older age groups unconstrained, more than 1,200 cases of IPD and 103 deaths were estimated to be prevented by switching to PCV13 over 5 years.
Conclusions

Observed increasing rates of IPD due to serotypes 3 and 19A in Finland could be reversed by changing the infant NIP to PCV13. Switching to PCV13 could substantially reduce disease compared with maintaining PCV10.
THE HEALTH & ECONOMIC BURDEN OF VARICELLA IN ASIA PACIFIC: AN UPDATED REVIEW

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Background and aims

To characterize the burden of varicella in Asia Pacific (AP) countries.

Methods

A systematic electronic search of Embase® and MEDLINE® was conducted from database inception through January 2016. Ministry of Health websites and the IMSEAR database were searched. Publications in English related to varicella epidemiology (incidence, seroprevalence, complications, mortality), vaccine recommendations, utilization and economic burden (healthcare resource use, direct/indirect costs) were reviewed for data extraction.

Results

The review identified 97 studies covering 17 AP countries. Australia, New Zealand, South Korea, and Taiwan have publically funded one-dose vaccination programmes; Japan, Hong Kong (funded) and Singapore (unfunded) have two-dose programmes. An additional 4 countries (China, India, Malaysia, Philippines) have professional society recommendations for use of varicella vaccination (unfunded). The most commonly reported outcomes were seroprevalence (49), incidence (39), complications (17), and mortality (11). Pre-vaccine incidence rates (per 100,000) ranged from 74-225 (India), 830 (Taiwan), and 1134 (New Zealand). Annual reported post-vaccination incidence rates were 19.6 (Australia), 8.3 (New Zealand), 220 (Taiwan). In South Korea, incidence has risen from 22.5 (2006) to 73.2 (2015) despite the start of a NIP in 2005. Data demonstrated high seropositivity in adolescents and adults (Figure). Six studies provided evidence on cost-effectiveness of vaccines, 33 studies on varicella-related health-care resource utilization, and 9 on economic burden.
Conclusions

Seroprevalence data shows a higher burden of disease than supported by reported incidence rates. The potential value of universal varicella vaccination to countries that have not yet implemented it cannot be understood without a better quantification of the health and economic burden of varicella.
A REVIEW OF THE HEALTH AND ECONOMIC BURDEN OF VARICELLA IN THE MIDDLE EAST

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Background and aims

To characterize the epidemiological and economic burden of varicella in Middle Eastern (ME) countries.

Methods

Systematic electronic searches were conducted in Embase®, MEDLINE®, and Index Medicus for the WHO Eastern Mediterranean Region (IMEMR) up to January 2016.

Results

Over 50% of the region’s population has access to universal varicella vaccination (UVV), with single-dose UVV in Turkey (2013) and Oman (2010), and two-dose programmes in Israel (2008), Bahrain (2015), Kuwait (2017), Qatar (2010), Saudi Arabia (2008), and UAE (2010). Varicella incidence per 100,000 was 222.6 in Iraq (2011), 5.7 in Israel (2009), 394.8 in Saudi Arabia (2008), 5.3-6.9 in Turkey (2008-2010), and 373-790 in UAE (2000-2004). Varicella incidence was highest among 5-14 year olds. Overall pre-vaccine varicella seropositivity was 27.6 (6-10y) to 94.6% (11-45y) in Iran, 87.6% to 98% (all ages) in Israel, 86% (all ages) in Saudi Arabia, 22.3% (1-5y) to 98.2% (21-30y) in Turkey, and 88% (all ages) in UAE. The overall estimated incidence of varicella-related hospitalization per 100,000 patients was 5.3-6.9 in Turkey and 6.1-7.0 in Israel. The most frequent complications among hospitalised patients were respiratory, skin, and neurological. The mortality rate was 0.05% (n=2) in Saudi Arabia (2001-03), 4.9% (n=5) in UAE (2005-08), 2.7% (n=1) in Turkey (2008-2010), and 0 in Israel. Four studies characterized the economic burden of varicella. Limited data are available for low-and middle-income countries (LMICs).

Conclusions

Substantial evidence of high varicella burden in ME exists, although additional data for LMICs are needed. Consideration of vaccination programmes in countries without UVV is warranted.
EFFECT OF CLIMATIC VARIABILITY ON CHILDHOOD DIARRHEA AND ITS HIGH RISK PERIODS IN NORTHWESTERN PARTS OF ETHIOPIA
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Background and aims

Background: Climate variability as a result of climate change will be one of the public health challenges to control infectious diseases in the future, particularly in sub-Saharan Africa including Ethiopia.

Objective: to investigate the effect of climate variability on childhood diarrhea (CDD) and identify high risk periods of CDD.

Methods

The study was conducted in all districts located in three Zones of Amhara Region, Ethiopia. Monthly CDD cases for 24 months (from July 2013 to June 2015) from the routine surveillance system were used for the study. Temperature, rainfall and humidity were extracted from satellite dataset. The space-time permutation scan statistic was used to identify high risk periods of CDD. A negative binomial regression was used to investigate the relationship between cases of CDD and climate variables.

Results

The monthly incidence rate of CDD was 11.4 per 1000 (95%CI 10.8-12.0) with significant variation between males [12.5 per 1000 (95%CI 11.9 to 13.2)] and females [10.2 per 1000 (95%CI 9.6 to 10.8)]. The most likely high risk period of CDD was between March and June 2014. Monthly average temperature and monthly average rainfall were positively associated with the rate of CDD, whereas the relative humidity was negatively associated with the rate of CDD.

Conclusions

This study found that the most likely high risk period is in the beginning of the dry season. Climatic factors have an association with the occurrence of CDD. Therefore, CDD prevention and control strategy should consider local weather variations to improve programs on CDD.
EPIEMIOLOGIC STUDY OF SEPSIS IN A PEDIATRIC HOSPITAL IN SHANGHAI
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Background and aims

Sepsis is the burden of the social, it is one of the main cause of death in hospital. To reduce the mortality of sepsis, we should realize the severity of the disease early.

Methods

We performed a retrospective study in Fudan University Pediatric Hospital from 2012 to 2014. All patients with sepsis were included.

Results

A total of 966 patients, 0.9% admissions were diagnosed with sepsis according to clinical criteria and included into this study. Analysis of the incidence of sepsis and severe sepsis in different age groups suggested that children in the range of 1 month to 1-year-old with high incidence of sepsis (p = 0.000). The first three kind of primary affection of sepsis were pneumonia, bloodstream infection and digestive tract infection. The first three kinds of pathogens were coagulase-negative staphylococcus aureus group, Escherichia coli and Klebsiella pneumoniae. The overall hospital mortality rates were 17.1% (n = 165). Analysis of mortality in septic patients of different ages suggested that the mortality of older children with sepsis was higher than those of younger children with sepsis (p = 0.000). Analysis of mortality in patients with severe sepsis of different ages suggested that the mortality in patients with severe sepsis was independent of age (p = 0.248).

Conclusions

Our results indicated that sepsis were common complications in inpatients and with high mortality in China. It can be of help to know more about sepsis and septic shock in China and to improve characterization and risk stratification in these patients.
IDENTIFICATION AND CHARACTERIZATION OF CLOSTRIDIUM DIFFICILE GENOTYPE ST37/017 BY MALDI-TOF MASS SPECTROMETRY

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Background and aims

Clostridium difficile infection caused by the toxin A-negative, toxin B-positive (A-B+) C. difficile variant has increased around the world recently. Multilocus sequence type 37 and PCR ribotype 017 (ST37/017), which has a high level resistance to various types of antibiotics, has been revealed as the dominant A-B+ genotype in China. It is clinically and epidemiologically desirable to rapidly detect and identify C. difficile genotype ST37/017.

Methods

In this study, 159 C. difficile clinical isolates including 20 ST37/017 and 139 ST37/017 were analyzed using matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS).

Results

Distribution of two major protein peaks (m/z 3240 and 3285) was significantly different between ST37/017 and non-ST37/017 isolates. Both peaks were present in 19 ST37/017 isolates with sensitivity of 95.0%. In contrast, both peaks were absent in 138 non-ST37/017 isolates with specificity of 99.3%. The only non-ST37/017 isolate with the two peaks was an ST81/017. This finding was reproduced in both bioMérieux Vitek MS and Bruker Microflex LT systems.

Conclusions

Our results suggested that MALDI-TOF MS provides a rapid and accurate tool to identify C. difficile genotype ST37/017. Work is in progress to characterize the two molecules with peaks at m/z 3240 and 3385 that appear to be specific for C. difficile genotype ST37/017.
THE RISK AND PREVENTION OF OCCUPATIONAL EXPOSURE TO THE MEDICAL WORKERS IN WARD OF HAND FOOT AND MOUTH DISEASE

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Background and aims

To investigate inapparent infection rate of Enterovirus 71(EV71) and Coxsackie A16(CA16) within the group of the medical workers in the ward of hand foot and mouth disease(HFMD) and to provide an important reference to risk reduction and prevention of occupational exposure.

Methods

A total of 63 cases of medical workers (including 23 cases of medical workers in the ward of HFMD) and 43 cases of healthy adults were involved into the research. 5～8 grams of stool sample and 3ml peripheral blood sample for every case were collected and conserved under -70°C in the fridge. They were detected for EV71/CA16 of enterovirus nucleic acid by fluorescence quantitative RT-PCR and for EV71/CA16-IgG by ELISA.

Results

All stool samples detected for enterovirus nucleic acid were negative. No significant difference was observed for EV71 seroprevalence between the medical workers(17.46%) and non-medical workers(18.60%) (x²=0.023, P>0.05) .Comparatively the seroprevalence of CA16 for the group of medical workers was 95.24% which is higher than that for the group of healthy adults(53.49%) (x²=26.219, P<0.05) . The seroprevalence for EV71 was found to be 26.09% for the group of medical workers in department of HFMD and 12.50% for those in other department without a significant difference (x²=1.047, P>0.05) . Similarly the seroprevalence for CA16 was revealed to be 91.30% for the group of medical workers in department of HFMD and 97.50% for those in other department without a significant difference (x²=0.247, P>0.05) . Compared to the group of nurse(35.71%), the seroprevalence for EV71 was 11.11% for the group of doctors and there was no significant difference(P>0.05). The seroprevalence for CA16 was 100% for the group of doctors and 92.86% for the group of nurses without a significant difference(P>0.05).

Conclusions

The inapparent infection rate of CA16 for medical workers was significantly higher than the healthy adults. However there was no significant difference in inapparent infection rate of EV71 or CA16 between the medical workers in department of HFMD and those in other department. So we should reduce the occupational exposure and enhance the consciousness of prevention and control for all the medical workers.
ANALYSIS OF SEROTYPE AND CLINICAL MANIFESTATION OF 80 CHILDREN WITH INVASIVE PNEUMOCOCCAL DISEASE IN SUZHOU

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Objective: To understand serotype and clinical manifestation of children with invasive pneumococcal disease (IPD) in Suzhou. Methods: Eighty children diagnosed with invasive pneumococcal disease were enrolled into our study from Jan. 2011 to Dec. 2015. The data of epidemiology, serotype, clinical manifestation, laboratory results and prognosis were collected and analysed. Results: The average age of 80 children with IPD was (2.18 1.93) y, including 51 male with the age of (2.31 2.10) y, and 29 female with the age of (1.96 1.58) y. Forty-nine samples applied from blood, twenty-four from cerebral spinal fluid and seven from plural effusion. Serotype of 80 cases were listed in descending order: 6B (20/80), 14 (19/80), 19F (12/80), 19A (12/80), 23F (7/80), 9V (4/80), 20 (4/80) and 15B/C (2/80), serotype of 13 dead cases were listed in descending order: 6B (4/13), 14 (4/13), 19F (2/13), 19A (1/13), 23F (1/13), 20 (1/13). The percentage of sensitivity of 80 streptococcus pneumoniae to penicillin, cefotaxime, clindamycin, erythromycin, SMZ, amoxicillin, chloramphenicol, vancomycin and linezolid are 5%, 11%, 1%, 0%, 10%, 68%, 95%, 100% and 100% respectively. 7-valent pneumococcal conjugate vaccine covered 77.5% of serotype of IPD cases and 85.7% of dead cases. 13-valent pneumococcal conjugate vaccine covered 92.5% of serotype of IPD cases and 92.9% of dead cases. Conclusion: invasive streptococcus pneumoniae is the important pathogen leading to high morbidity and mortality in children below 3 years. The leading serotype of children with IPD in Suzhou is 6B, 14, 19F, 19A and 23F, 7 and 13-valent pneumococcal conjugate vaccine can cover most of serotype of IPD in children.

Eighty children with IPD were enrolled into our study from Jan. 2011 to Dec. 2015. The data of epidemiology, serotype, clinical manifestation, laboratory results and prognosis were collected and analyzed. The average age of 80 children with IPD was 2.2 y. Forty-nine samples applied from blood, twenty-four from cerebral spinal fluid and seven from plural effusion. Serotype of 80 cases were listed in descending order: 6B, 14, 19F, 19A, 23F, 9V, 20 and 15B/C, serotype of 13 dead cases were: 6B, 14, 19F, 19A, 23F and 20. The percentage of sensitivity of 80 streptococcus pneumoniae to penicillin, cefotaxime, clindamycin, erythromycin, SMZ, amoxicillin, chloramphenicol, vancomycin and linezolid are 5%, 11%, 1%, 0%, 10%, 68%, 95%, 100% and 100% respectively. 7-valent pneumococcal conjugate vaccine covered 77.5% of serotype of IPD cases and 85.7% of dead cases. 13-valent pneumococcal conjugate vaccine covered 92.5% of serotype of IPD cases and 92.9% of dead cases. Invasive streptococcus pneumoniae is the important pathogen leading to high morbidity and mortality in children below 3 years. The leading serotype of children with IPD in Suzhou is 6B, 14, 19F, 19A and 23F, 7 and 13-valent pneumococcal conjugate vaccine can cover most of serotype of IPD in children.
Immunization schedule had changed the epidemiology of bacterial meningitis. Vaccines were introduced in Portugal in the last two decades: Haemophilus influenzae type b (Hib) (2000), Neisseria meningitidis serotype C (2006) and 13-valent pneumococcal conjugate (2015). Surveillance data are important to determine trends in meningitis.

Retrospective study of children with bacterial meningitis between 2007-2016 in a level II Portuguese hospital. The agent was identified by culture or polymerase chain reaction (PCR).

A total of 38 cases were included with median age 3.9 years. 29/38 (76%) patients had updated immunization schedule. Streptococcus pneumoniae (50%), Neisseria meningitidis (22%) and Streptococcus agalactiae (10.5%) were the most frequent agents. No Hib cases were reported. Median of 4 cases/year (maximum of 7 in 2016). Empiric treatment was ceftriaxone plus vancomycin. Complications occurred in 19/38 (47.4%) cases: sepsis (15), disseminated intravascular coagulation (9), renal failure (5), seizures (4), focal neurological signs (4) and coma (4). 30/38 (78.9%) patients were admitted to intensive care unit. One fatality case was reported: a 20-day old with Streptococcus agalactiae meningitis. Sequels occurred in 12/38 (31.5%) cases: development delay (7), hearing loss (4) and neurologic sequelae (3). Median follow up time was 2.3 years. Immunity study was negative in all pneumococcal meningitis.

No cases of Hib meningitis were reported whereas meningococcal meningitis decreased and pneumococcal meningitis cases remained stable. Recent introduction of pneumococcal conjugated vaccine in our immunization schedule and accessibility to the new meningococcal group b vaccine are expected to bring further reduction of incidence of bacterial meningitis in children.
SEVERE CHILDHOOD BACTERIAL INFECTIONS

PSEUDOMONAS AERUGINOSA IS A REMARKABLE PATHOGEN OF NECROTIZING PNEUMONIA IN CHILDREN IN SHENZHEN, CHINA

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BACKGROUND: Necrotising pneumonia (NP) is a severe complication of pneumonia increasingly detected in children. The aim of our study was to describe the epidemiology, aetiology and clinical manifestations of NP in children in Shenzhen, China.

METHODS: A retrospective study of NP cases was conducted in Shenzhen children’s hospital from January 2009 to December 2016 analysing clinical presentation, laboratory data, hospital course and follow-up.

RESULTS: A total of 41 NP cases were identified, with the number of detected cases increasing from 11 in the period 2009-2012, to 30 in the period 2013-2016. Thirty-eight were community-acquired pneumonia, 7 had underlying diseases. NP cases had long course of fever (13.7±6.9 d) and days of hospitalization (21.1±11.1 d), the C-reactive protein were elevated (113.7±66.2 mg/L), excepted one. In total, 65.9% (27/41) cases had pleural effusion and/or pneumothorax. Pleural drainage was performed in 17 and pleural decortication was performed in 3 cases. In 38 community-acquired cases, 24 had identified pathogens, S.aureus and P.aeruginosa accounted for 29.2% (7/24) respectively, followed by S.pneumoniae which accounted for 25.0% (6/24), Mycoplasma pneumoniae accounted for 12.5% (3/24). Except one with uncontrollable infection was referred for partial lung resection, all the cases were cured with a mean course of (2.5±1.6) month for chest CT resolution.

CONCLUSIONS: Necrotizing pneumonia in children are increasingly detected in Shenzhen, China. P.aeruginosa as a pathogen is remarkable, which should be covered by first-line antibiotics.
Background and aims

Enteric infection with Salmonella species is not uncommon in developed countries and is mostly uncomplicated. We report a 16 month nutritionally normal boy infected with Salmonella enterica, subspecies Javiana complicated by presumed protein losing enteropathy leading to renal impairment.

Methods

Case History

A 16/12 boy with 2 days of febrile illness presented to ED after a generalised convulsion of 2 minutes. He was conscious, but miserable and unwell, with fever of 38.8 C, heart rate of 170 b/min and suggestion of facial oedema. A lumbar puncture excluded meningitis and ceftriaxone was commenced. He developed vomiting and profuse watery loose stools leading to circulatory collapse, requiring saline resuscitation. Over the next 5 days, oedema of the face worsened, extended to other areas of the body and BP rose to 110/60 mm/Hg. In blood, creatinine rose to 75 micromol/L, bicarbonate fell to 13 mmol/L, and albumin to 25 G/L. His urine revealed trace of blood and only 30 mg/L of protein.

Results

On the presumption of protein loss in the bowel, he was given 20% concentrated albumin (1gm/kg). He improved rapidly and was discharged two days later with minimal oedema (see photographs). He was normal on subsequent reviews.

Conclusions

This child demonstrates an unusual complication of salmonella infection: protein losing enteropathy and hypoalbuminaemia leading to renal impairment.
SIX YEARS OF CAT SCRATCH DISEASE IN A PEDIATRIC HOSPITAL
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²National Institute of Health Dr. Ricardo Jorge, National Institute of Health Dr. Ricardo Jorge, Lisboa, Portugal

Background and aims

Cat scratch disease is an infection typically characterized by self-limited regional lymphadenopathy. In a few cases, a wide clinical spectrum and systemic involvement can occur. Characterize Bartonella infections in a pediatric population that required hospitalization.

Methods

Descriptive study of Bartonella infection in children admitted at the hospital between January 2010 and December 2016. Epidemiologic, clinical and laboratory parameters were studied.

Results

We identified 18 cases, with average age of 8 years old. 15/18 (83%) have contact with cats. The clinical presentations were lymphadenopathy mimicking suppurative infections (6), fever of unknown origin (3), osteomyelitis (6), neuroretinitis (2) and encephalitis (1). All cases had confirmation by seroconversion of antibodies against Bartonella and in two cases by molecular detection and sequencing. The therapeutic approach was performed based on the clinical manifestations: azithromycin in lymphadenitis infections, rifampicin plus doxycycline or ciprofloxacin in neuroretinitis and encephalitis and rifampicin plus doxycycline, ciprofloxacin or cotrimoxazole in osteomyelitis. HIV infection and interleukin deficiency were investigated in 5/18 patients and all were negative. Four patient’s cats were tested and treated by the veterinarians.

Conclusions

A high clinical suspicion is needed to do the diagnosis, because of the similarities to other infections. The gold standard therapy for Bartonella infection is yet unknown. Recommendations for systemic disease are lacking, however several combinations of antibiotics have been proposed. Although atypical infection has classically been associated with immunodeficiency, this has not been the rule in systemic disease and the extensive evaluation must be reviewed.
Septic shock can lead to a high rate of mortality in oncology patients. The aim of the study is to analyze the cause, clinical features and outcomes of 9 acute leukemia children who suffered from septic shock post chemotherapy. 254 pediatric acute leukemia patients in the Hematology and Oncology department from October 1, 2012 to April 1, 2015 were enrolled. The onset of septic shock, clinical features and laboratory data, management and prognosis were reviewed. 9 children developed septic shock post chemotherapy, of which 5 were cold shock and 4 were warm shock. The most common symptoms prior to septic shock were fever (9 cases), cough (4 cases) and abdominal pain (2 cases). Dizziness and thirst were the prominent early symptoms. The onset was related to treatment stage, as 7 cases occurred during induction, and 2 occurred during intensification. The transition from diagnosis of infection to septic shock was short (range 0 to 7 days). Incidence of septic shock was associated with myelosuppression, as all children had severe neutropenia (8 cases with ANC<0.1×10^9/L and 1 with ANC<0.5×10^9/L) and elevated serum C-reactive protein and procalcitonin. Seven (7/9) patients did not survive. Septic shock is an important cause for morbidity and mortality in patients with acute leukemia following intensive chemotherapy. Infection prevention is the most important way to reduce mortality in high-risk patients. Early recognition, antibiotic therapy and prompt resuscitation during the first several hours of septic shock are key to better prognosis.
Background: Treatment uninformed by the antibiogram of predominant circulating pathogens may result in unnecessary costs, poor clinical outcomes, and spread of resistant bacteria.

Methods: Between 2011 and 2014, young infants up to age 59 days are enrolled and blood specimens collected if they had severe chest indrawing, temperature <35.5 °C or >=38.0 °C, lethargy, convulsions, or poor feeding. Blood culture was performed using BACTEC. Isolation of bacteria and susceptibility testing of the isolates were performed according to the CLSI guidelines.

Results: 4,859 blood cultures were performed and 102 pathogens detected (2.4%); 65% were gram-negative, dominated by *Escherichia coli* (n=21) and *Klebsiella* (n=17), among the gram-positives *Staphylococcus aureus* (n=12) and Group A *Streptococci* (n=11) were predominant. Isolates were highly susceptible to chloramphenicol (90%) gentamicin (74%) and ciprofloxacin (73%) but were less susceptible to ampicillin/penicillin (41%). Isolates showed moderate rate of susceptibility to third generation cephalosporin (63%) and cotrimoxazole (65%), table 1.

Discussion:

Overall, 83% of bacterial isolates (gram-positive: 97%; gram-negative: 75%) were susceptible to penicillin/ampicillin and/or gentamicin. Compliance in using these first line antibiotics to treat community acquired young infant infections will prevent the emergence of resistance of bacteria against the next generation of antibiotics.
Table 1: Antimicrobial susceptibility profile of the bacterial isolates.

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Percentage of susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Bacteria (N=102)</td>
</tr>
<tr>
<td>Ampicillin/ Penicillin</td>
<td>41</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>63</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>90</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>73</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>65</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>74</td>
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</tbody>
</table>
TREATMENT OUTCOME OF PEDIATRIC PATIENTS WITH SERRATIA, PSEUDOMONAS, INDOLE-POSITIVE PROTEUS, CITROBACTER, ENTEROBACTER SPP. (SPICE) ORGANISMS; NONCARBAPENEM VERSUS CARBAPENEM GROUP

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Background and aims

*Serratia, Pseudomonas, Indole-positive Proteus, Citrobacter, Enterobacter* spp. (SPICE) organisms are pathogens that often require carbapenem treatment. The purpose of this study is to evaluate treatment outcome of carbapenem or noncarbapenem treated patients who had invasive SPICE infection.

Methods

This is a single-center, retrospective study. Pediatric patients ≤ 18 years old with SPICE meningitis or bacteremia were included and neonates were excluded. Patients were divided into two groups; noncarbapenem and carbapenem group. Noncarbapenem group was defined when only noncarbapenem was used. Carbapenem group was defined when at least one dose of carbapenem was used for treatment at any point.

Results

Thirty patients were identified. Thirteen (43.3%) patients were male and median age was 4.8 years (range 0.2 - 17.2 years). Two (6.7%) patients had meningitis and 28 (93.3%) patients had bacteremia. Twenty-nine (96.7%) patients had chronic underlying diseases. Six (20%) patients received noncarbapenem antibiotics and 24 (80%) patients received carbapenem antibiotics. Among these 24 patients, 9 (9/24, 37.5%) patients were switched to noncarbapenem antibiotics and finished treatment successfully. Six (20%) patients died and all 6 patients died within 3 days of bacteremia despite carbapenem treatment from the beginning. In remaining 24 patients, 15 (62.5%) patients finished the treatment course with noncarbapenem antibiotics (6 patients who received only noncarbapenem antibiotics, 9 patients who received step-down therapy) and 9 (37.5%) patients finished the treatment with carbapenem antibiotics.

Conclusions

This study showed that 50% of pediatric patients with invasive SPICE infection successfully finished treatment with noncarbapenem agents; either from the beginning or using step-down therapy strategies.
Background and Aims: To improve awareness of streptococcal toxic shock syndrome (STSS) in children, and summarize the diagnosis and treatment of STSS combined with dry gangrene.

Methods: The clinical information about a case of STSS combined with dry gangrene in child was analyzed retrospectively and the literature reviewed.

Results: In this case, the clinical manifestations were fever, rash, shock, multiple organ dysfunction syndrome, increased inflammation indicators, DIC and dry gangrene. Blood culture was streptococcus pyogenes. He completed the course of active anti-infective, recovered and was discharged.

Conclusion: We should improve awareness of STSS which is characterized by speedy development, many complications and high mortality. When combined with dry gangrene, we must first treat the primary disease and DIC. Most patients can avoid amputation through early diagnosis and treatment. For children to choose appropriate treatment is essential.
Background and aims

Infections of burn wounds are a major cause of morbidity and mortality in burned patients. Several factors increase the risk of infection, including the extent and depth of the burn, presence of comorbidities, age, etiology of thermal injury and the number of microorganisms colonizing burn wounds.

Methods

Case Report

Results

A previously healthy 2-year-old female, native of Angola, was admitted with a burn of 60% total body surface area. She was admitted to the intensive care (mechanical ventilation and central catheter). On day 21 of hospitalization *Pseudomonas aeruginosa* was isolated in cultures of the superficial burn exudation and ceftazidime and gentamicin were started. On day 84 of hospitalization, developed sepsis of the catheter by *Candida albicans* and amphotericin B was started. At the same time, HIV infection was diagnosed (viral load 1965000 copies/mL). During a long term hospitalization and fever with evidence of colonization with multidrug resistant bacteria, she completed several cycles of beta-lactams, aminoglycosides, carbapenems and glycopeptides. There continued to be rejection of skin grafts and a new sepsis has developed with a multidrug resistant *Pseudomonas aeruginosa* and colistin and Hyperbaric Oxygen Therapy (HBOT) was initiated. Progressive infection improvement with a favorable graft evolution was verified after thirty sessions.

Conclusions

Burned patients are likely to benefit from HBOT due to increased tissue oxygenation and bigger tissue preservation, bringing benefits to burn wounds and concomitant infection. Colistin, an old antibiotic, currently be used as an agent of last resort because of its toxicity for the treatment of infections caused by multidrug-resistant organisms.
EVALUATION OF MALARIA AND BACTEREMIA AS MAJOR CAUSES OF FEBRILE EPISODE IN LOW-RESOURCE HEALTHCARE SETTING

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Background and aims

Febrile episode remains the major cause of high morbidity and mortality among children in sub-Saharan Africa. In low-resource settings, effective diagnosis hinges on the malaria parasites detection and bacterial pathogens isolation complimented by the clinical presentation. This retrospective study evaluated the microbiological data and clinical presentation of children with febrile episode in low-resource setting.

Methods

Microbiological and clinical data of 135 febrile children that attended Federal Medical Centre, Nguru were extracted and analysed. Microbiological examination included blood smear for malarial parasite and blood culture for bacteria isolation. The antibiotic susceptibility pattern of the bacterial isolates was recorded.

Results

Mean age of the children was 10.5±5.7 years with 55.6% (75/135) male and 44.4% (60/135) female. Prevalence of malaria parasitaemia (32.6%, 44/135) was similar to bacteremia (37.8%, 51/135) [p>0.05] but higher than co-infection of malaria and bacteremia (16.3%, 22/135) [p<0.05]. Five bacterial pathogens isolated are: *Staphylococcus aureus* (66.9%, 34/51), *Salmonella* spp. (19.6%, 10/51), *Escherichia coli* (7.8%, 4/51), other Coliforms (3.9%, 2/51) and *Streptococcus pneumoniae* (2.0%, 1/51) [p<0.05]. Statistical significance difference was observed between the clinical details and microbiological data (p<0.0001). High resistance pattern to commonly prescribed antibiotics cotrimoxazole, ampicillin, penicillin, augemintine,gentamycin recorded

Conclusions

The study has portray the implication of malaria and bacteremia in febrile episode in the study area. More comprehensive study is needed for better understand of other aetiological agents associated with febrile episodes.
SEROTYPE DISTRIBUTION OF STREPTOCOCCUS PNEUMONIAE CAUSING INVASIVE DISEASE IN CENTRAL THAILAND, 2012-2016

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Background and aims

Data regarding serotype distribution of S. pneumoniae causing invasive pneumococcal disease (IPD) in Thailand is limited. This study aimed to describe the serotype distribution of S. pneumoniae causing IPD, serotype coverage rates of the pneumococcal conjugate vaccines (PCVs) and to identify the emerging non-vaccine serotypes (NVT).

Methods

Pneumococcal isolates from sterile specimens of patients in a collaborative network in Bangkok during 2012-2016 were studied. Pneumococcal serotypes included in the 15-valent PCV were identified by Quellung test. The non-PCV15 serotypes were identified by multiplex PCR.

Results

Of 276 pneumococcal isolates, 129 (46.7%) were from children age < 5 years. Among 144 patients with available clinical data, 80 (55.6%) had comorbidities and 13 (9.0%) received PCV prior to the onset of IPD. A case-fatality rate was 9.6%. The most common vaccine serotypes were 6B (17.4%), 19A (13.0%), and 14 (11.2%), respectively. The non-PCV15 serotypes were found in 27.9%; the most common serotype were 15B/C (5.1%) followed by 15A/F (4.0%), and 23A (3.6%), respectively. The serotype coverage rates of PCV10 in children < 5 years and all ages were 55.8% and 53.3%, respectively. PCV13 provided similar coverage rates to that of PCV15, 71.3% and 72.1% in children < 5 years and all ages, respectively. The serotype coverage rate for a 23-valent pneumococcal polysaccharide vaccine was 82.9%.

Conclusions

Majority of pneumococcus causing IPD in central Thailand were covered by the available pneumococcal vaccines. The emergence of NVT underscores the importance of serotype monitoring which is useful for the future vaccine development.
Invasive meningococcal diseases (IMD) caused by *Neisseria meningitidis* (Nmen) impose a global burden. However, limited data on IMD from Asia hinder effective treatment and prevention strategies. A surveillance was initiated in 2004 in Bangladesh to monitor epidemiology of IMD.

IMD surveillance was performed from 2004-2016 in three paediatric hospitals. Blood and/or CSF samples were collected from suspected sepsis/meningitis cases. Nmen was detected using culture and latex agglutination test (LAT) from 2004-2016; PCR was added in 2007. Serogrouping and MLST were performed using PCR/genome analysis. Outcome of cases was assessed by follow-up visits and locations were tracked using GPS mapping. Susceptibility to eight antibiotics was tested.

In 13 years, 182 IMD cases were identified; 75% cases were culture-negative and detected using LAT (27%) and PCR (48%). Median age of cases was 10 months; 6% died, 29% survived with sequelae. Among 152 serogrouped cases, gradual replacement of serogroup A by B is observed: during 2004-2009, 76% (47/62) were A, 2010-2016, 81% (73/90) were B. Minimal resistance was found against all antibiotics but cotrimoxazole, to which 98% were non-susceptible. MLST of 44 strains elucidated 19 sequence-types and GPS mapping showed no sign of outbreaks.

This is the first study to demonstrate epidemiology of IMD in Bangladesh. Most IMD occur during infancy and many children die or become disabled. Serogroup B is gradually becoming more prevalent. Ongoing surveillance is required to monitor resistance and serogroup dynamics for evidence-based treatment and vaccination strategies.

Acknowledgement: The study was partially supported by WHO.
Disease presentation due to Salmonella varies from enteric fever due to *Salmonella* Typhi to gastroenteritis / systemically invasive disease and bacteremia due to Non-Typhoidal Salmonella (NTS). India being considered endemic for enteric fever, invasive Non Typhoidal Salmonella (iNTS) remains a neglected entity.

**Aim:** Retrospectively analyse the demographics, clinical presentation, resistance pattern and outcomes of patients admitted to a pediatric facility in Delhi with NTS bacteremia, and to compare them to those associated with *S*. *Typhi* bacteremia.

**Methods**

Retrospective study from Jan 2009 to December 2016 was conducted to evaluate 1261 children <12 years with culture-proven *Salmonella* infection.

**Results**

During the study period, January 2009 to December 2015, 1221 were typhoidal cases while 40 were non-typhoidal cases. Number of cases presenting with iNTS outnumbered cases presenting as NTS gastroenteritis. The mean age for acquiring NTS infection was 2.75 years while for Typhoidal infection was 6.1 years. Most common age group affected by NTS infection was <1 year (54.54%). Attributable mortality due to iNTS was 24.1%. Among the typhoidal *Salmonella* most common serotype was *Salmonella* Typhi, while most common serotypes causing NTS were *S*. *Typhimurium* (64.7%) followed by *S*. *Gallinarum* (17.6%). Overall resistance for nalidixic acid, ciprofloxacin, chloramphenicol, ampicillin and azithromycin were 75%, 37.5%, 4.2%, 5.9% and 14.2% respectively where as all isolates were susceptible to ceftriaxone and trimethoprim-sulphamethoxazole.

**Conclusions**

Though the prevalence of NTS was much less as compared to typhoidal salmonella but its higher prevalence in age group less than 3 years warrants clinicians to be more vigilant about the possibility in our settings.
CATHETER RELATED BLOOD STREAM INFECTION CAUSED BY BACILLUS CEREUS

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Background and aims

Bacillus cereus is a facultative aerobic gram positive bacilli which is abundantly found in air, water and soil. It is usually interpreted as contamination when it is isolated from clinical specimens. Recently, it has been, reported as health-care associated infectious agent (HAIA) in patients with immune deficiency, receiving chemotherapy, with prolonged hospitalization and who had been performed invasive procedures.

Methods

This case was reported in order to increase the awareness of clinicians for the pathogenicity of Bacillus cereus. Piperacillin- tazobaktam was started for non-neutropenic fever to an 18-month old girl with acute lymphocytic leukemia.

Results

Her catheter-drawn blood sample revealed Bacillus cereus growth. Teicoplanin was added to therapy for unremitting fever, since Bacillus species are resistant to penicillin. Echocardiography did not reveal any sign of infective endocarditis. Her catheter was withdrawn since repeated peripheric and catheter drawn blood samples yielded Bacillus cereus growth on alternate days. Her fever dropped after the catheter was withdrawn. In conclusion, it must be remembered that Bacillus cereus can be a HAIA and should not be always interpreted as contamination.

Conclusions

Besides, since Bacillus species are resistant to penicillin derivatives, therapy should be held as vancomycin and/or amikacin.
Background and aims

Conjugated vaccines introduction into national routine immunization programs has impacted positively the burden of invasive bacterial disease (IBD) worldwide. We present IBD data seven years after *Haemophilus influenzae* b vaccine and three year after pneumococcal vaccine (PCV13) introduction into Togolese immunization schedule.

Methods

We have performed review for hospitalization registers at five hospitals to assess trends in invasive bacterial disease hospitalizations among children aged<5 years. For the vaccine impact analysis, the period from July 2010-June 2014 was considered as pre- PCV13 vaccine period and the post-vaccine period was July 2014-June 2017.

Results

From 2010 to 2014, 26,787 children <5 years of age were hospitalized with all-cause in 5 hospitals included in pediatric hospitalizations registers review (annual ranged: 4,071 - 5,966; mean: 5,357). Hospitalization of 4,122 (15%) children <5 years was with IBD (meningitis, pneumonia); and the range was 621 to 987 (10% - 17%). A mean of 824 (15%) children <5 years were hospitalized per year with IBD. In 2015, 4,752 children were hospitalized; and 6,918 hospitalized in 2016. In 2015 and 2016, 10% (33% reduction) of children were hospitalized with IBD, respectively. Declines in proportion of hospitalizations with IBD were most marked among infants.

Conclusions

We report rapid and marked reduction in proportion of hospitalizations with IBD in the first and second year post- PCV13 implementation in Togo. It is necessary to monitor long-term vaccine impact on IBD burden through continued hospitalization registers review.
Introduction In few cases *Micrococcus* spp. is considered as a pathogen, especially in patients with special situations, with a history of chronic diseases and prosthetics both valvular as well as articular. In this case it is described a pyoventriculitis by *Micrococcus luteus* in a 4-year-old pediatric patient with a history of hydrocephalus with peritoneal ventricular bypass.
Background and aims

X-linked agammaglobulinemia (XLA) is a prototypical human immunodeficiency characterized by low levels of B-lymphocytes and early onset of recurrent bacterial infections. XLA is caused by mutations in the Bruton tyrosine kinase (BTK) gene.

Methods

BTK mutations and clinical features of 7 patients with XLA were investigated. The mean age of onset was 4.3 years, and all patients had a medical history of recurrent infections, such as otitis media, pneumonia, and enteritis.

Results

We identified 5 previously reported mutations and 2 novel mutations, including three splicing (3), missense (2), frameshift (1) mutations, and larger deletion (1). We quantified the expression of BTK transcripts in granulocytes of 3 additional patients with splice-site mutations, and we found those patients had a very low levels of transcripts of BTK gene, only one patient was detected to have a skipping of exon 9 with a result of frameshift from cDNA.

Conclusions

Our results demonstrated distinctive molecular genetic characteristics of XLA, and we found two mutations than have not been reported before.
Background and aims

This study aims to investigate the clinical features of invasive community-acquired Staphylococcus aureus (CA-SA) infection in Chinese children and analyze its molecular features.

Methods

Clinical data and invasive CA-SA isolates were prospectively collected. Pediatric risk of mortality (PRISM) score was used for disease severity measurement. Molecular typing was then performed, followed by expression analysis for virulence genes.

Results

Among 163 invasive CA-SA infection cases, 71 (43.6%) were methicillin-resistant SA (MRSA) infections and 92 (56.4%) were methicillin-susceptible SA (MSSA). A total of 105 (64.4%) children were younger than 1 year old, and 79.7% (129/163) were under 3 years age. Thirteen kinds of diseases were observed, in which bacteremia and pneumonia accounted for 65.6% (107/163) and 52.8% (86/163), respectively. A total of 112 (68.1%) patients had two or more infective sites simultaneously, and four cases (2.5%) died. CA-MSSA more frequently caused multi-sites infections, bacteremia, and musculoskeletal infection than MRSA. A total of 25 sequence types (STs) were detected. MRSA mainly comprised ST59 (49/71, 69%), whereas the most frequent clonotypes were ST88 (15/92, 16.3%), ST25 (13/92, 14.1%), ST7 (13/92, 14.1%), ST2155 (12/92, 13%), and ST188 (9/92, 9.8%) for MSSA. Seven STs were common to both MSSA and MRSA groups. No differences in clinical presentation or PRISM score were found between the two groups or among different ST. The expression levels of the four known virulence genes varied among the six main ST clones.

Conclusions

Invasive CA-SA infections were characterized by high incidence and multi-site infections in young children in China.
INTERLEUKIN-6 AND INTERLEUKIN-10 ARE BETTER BIOMARKERS THAN PROCALCITONIN FOR EARLYLY IDENTIFYING HIGH-RISK INFECTION IN PEDIATRIC CANCER PATIENTS: A PROSPECTIVE OBSERVATIONAL STUDY

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Background and aims

The aim of this study is to systematically compare the performance of C-reactive protein (CRP), procalcitonin (PCT) and serum cytokines in identifying pediatric cancer patients with high-risk infection.

Methods

A prospective observational clinical study was conducted from January 2014 through December 2016. Consecutive pediatric cancer patients who experienced febrile illness during hospitalization were enrolled. The CRP, PCT, IL-6, IL-10, tumornecrosis factor (TNF)-α and interferon (IFN)-γ were determined within 6 hours of fever onset.

Results

A total of 3118 episodes of fever were included, with 13.1% episodes documented as BSI and 3.5% diagnosed as septic shock. Patients with BSI presented much higher levels of PCT, IL-6, IL-10 and TNF-α than patients with other types of fever (Table 1) and have much higher incidence of septic shock (11.2% vs. 2.3%, P<0.001). Patients with GNB presented higher inflammatory biomarkers’ levels and higher incidence of septic shock (16.5% vs. 5.5%, P<0.001) than those with gram-positive bacteremia (GPB). IL-6 and IL-10 showed better performance in identifying patients with BSI, GNB and septic shock than CRP and PCT, respectively (Table 2). Furthermore, the combination of IL-6 and IL-10 presented excellent ability to screen out low-risk patients in those with BSI as well, with an incidence of shock of only 0.7%.

Conclusions

BSI, especially GNB, is a high-risk form of infection which results in high incidence of septic shock. IL-6 and IL-10 present better performance than CRP and PCT in identifying patients with BSI, GNB and septic shock and in excluding low-risk cases.
DEEP VEIN THROMBOSIS AND STAPHYLOCOCCUS AUREUS SEPSIS IN A CHILD: CASE REPORT AND REVIEW OF LITERATURE

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Background and aims

We aimed to perform a systematic review of the literature in order to evaluate the incidence, clinical features, and outcomes of *Staphylococcus aureus* sepsis-related DVT in pediatric patients.

Methods

We described a previously healthy 8-month-old boy with an initial presentation of severe pain and swelling in the right limb with limitation of motion for 5 days. He had suffered from an intermittent high fever, tachypnea accompanied with decreased oxygen saturations for 3 days. Physical examination revealed bilateral coarse breathing sounds and crackles. The white blood cell count was 22.19G/L. The level of C-reactive protein (CRP) was 183.37mg/L. The coagulation test showed D-dimer 10.56 ug/mL, fibrinogen 3.43 g/L, fibrin degradation products 33.84 ug/mL.

Results

Methicillin-sensitive *Staphylococcus aureus* (MSSA) was subsequently isolated from blood cultures. Doppler ultrasonography of the limbs showed DVT of the right common iliac vein, external iliac vein and right femoral vein. Pulmonary CT showed bilateral diffuse multiple irregular nodular shadow in lungs, accompanied by cavity formation and bilateral pleural effusion. A magnetic resonance imaging (MRI) study of the lower extremities revealed thrombosis of the right deep vein and septic osteomyelitis.

Conclusions

*Staphylococcus aureus* can lead to invasive life-threatening disease especially in children. DVT is a rare disease in pediatric patients, but should be considered in children with *Staphylococcus aureus* sepsis accompanied with swollen extremities and motion limitations.
Background and aims

Sepsis is a syndrome that complicates severe infection and is characterized by the systemic inflammatory response syndrome, immune dysregulation, microcirculatory derangements, and end-organ dysfunction. Through analyzing the results of blood cellular immune function and biochemical from sepsis patients, we want to know the changes of these indexes and the correlation between them.

Methods

In this study, we divided into two groups, one is sepsis patients group (N=110, control group), another is severe sepsis patients (n=60, observation group), from which we collected blood samples in order to observe the cellular immune function and biochemical changes. The statistical tools we used are Mean t Test and Logist regression.

Results

Compared with the control group, the count of T lymphocyte in the observation group decreased (P <0.05), B lymphocyte increased (P <0.05), the serum alanine aminotransferase, aspartate aminotransferase, glutamyltransferase, lactate dehydrogenase, creatine synthase and creatinine increased in the observation group. (P <0.05). Compared with the control group, the levels of serum calcium decreased, triglyceride increased, total cholesterol decreases and high-density lipoprotein decreased, the difference between the two groups is statistically significant (P <0.05).

Conclusions

The degree of immune disorder in observation group is more serious than that in control group. And from this study, we found there was a correlation between the sepsis and lipid metabolic.
ANALYSIS OF SEROTYPE AND CLINICAL MANIFESTATION OF 80 CHILDREN WITH INVASIVE PNEUMOCOCCAL DISEASE IN SUZHOU

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Background and aims

To understand serotype and clinical manifestation of children with invasive pneumococcal disease (IPD) in Suzhou.

Methods

Eighty children diagnosed with invasive pneumococcal disease were enrolled into our study from Jan. 2011 to Dec. 2015. The data of epidemiology, serotype, clinical manifestation, laboratory results and prognosis were collected and analyzed.

Results

The average age of 80 children with IPD was (2.18±1.93) y, including 51 male with the age of (2.31±2.10) y, and 29 female with the age of (1.96±1.58) y. Forty-nine samples applied from blood, twenty-four from cerebral spinal fluid and seven from plural effusion. Serotype of 80 cases were listed in descending order: 6B (20/80), 14 (19/80), 19F (12/80), 19A (12/80), 23F (7/80), 9V (4/80), 20 (4/80) and 15B/C (2/80), serotype of 13 dead cases were listed in descending order: 6B (4/13), 14 (4/13), 19F (2/13), 19A (1/13), 23F (1/13), 20 (1/13). The percentage of sensitivity of 80 streptococcus pneumoniae to penicillin, cefotaxime, clindamycin, erythromycin, SMZ, amoxicillin, chloramphenicol, vancomycin and linezolid are 5%, 11%, 1%, 0%, 10%, 68%, 95%, 100% and 100% respectively. 7-valent pneumococcal conjugate vaccine covered 77.5% of serotype of IPD cases and 85.7% of dead cases. 13-valent pneumococcal conjugate vaccine covered 92.5% of serotype of IPD cases and 92.9% of dead cases.

Conclusions

Invasive streptococcus pneumoniae is the important pathogen leading to high morbidity and mortality in children below 3 years. The leading serotype of children with IPD in Suzhou is 6B, 14, 19F, 19A and 23F. 7 and 13-valent pneumococcal conjugate vaccine can cover most of serotype of IPD in children.
OSTEOARTICULAR SALMONELLA INFECTIONS IN HEALTHY CHILDREN

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Background and aims

To analyze the clinical characteristics of 6 previously healthy children with Salmonella osteoarticular infections.

Methods

6 previously healthy children with Salmonella osteoarticular infections who were admitted in our hospital between July and October 2014. Identification and characterization of the isolates were also performed and correlated to clinical findings.

Results

The predominant symptoms were fever, pain and swelling. Locations reported of the 6 cases, 3 patients with osteomyelitis (including 2 with left humerus, 1 with left tibia), 1 patient with osteoarthritis (elbow, right), 2 patients with septic arthritis (knee-joint, right). In our cases, children are likely to have fever (>39.0°C) as well as leukocytosis (>12.1×10^9/L), increased C-reactive protein (>12.1 mg/dL) and erythrocyte sedimentation rate (>47 mm/h). Radiographs can be helpful to diagnose the locations and MRI is the best choice to locate the lesions. Surgical drainage was undertaken in all children and aspirates were subsequently cultured. Intravenous anti-biotherapy combine with surgical drainage of purulent material was necessary for eradication of the infection. A 2-year follow-up showed good healing of all 6 children.

Conclusions

Osteoarticular infections caused by salmonella have no distinctive features, neither clinical manifestation nor radiological characteristic. Intravenous antibiotics combined with surgical debridement/drainage is necessary for eradication of the bacteria.
STAPHYLOCOCCUS AUREUS INFECTIVE ENDOCARDITIS IN CHILDREN: A 16-YEAR RETROSPECTIVE STUDY

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BACKGROUND:

We aimed to describe clinical characteristics, treatment and outcomes of Staphylococcus aureus infective endocarditis (SAIE) in children.

METHODS:

A retrospective analysis of clinical data of children with SAIE diagnosed between January 2000 to September 2015 was performed at the Shanghai Children’s Medical Center of Shanghai Jiao Tong University School of Medicine.

RESULTS:

161 patients with IE were identified. Positive blood cultures were detected in 67.1% cases (108/161), and 19.4% cases (21/108) were SAIE whom aged from 3 month to 16 years (5.6±5.4) years. Among the SAIE, 19.0% cases (4/21) were methicillin-resistant. 61.9% (13/21) cases had predisposing factors, of these, 12 had congenital heart defects and 6 had a history of cardiac intervention. 57.1% cases (12/21) were left sided infective endocarditis, and 42.9% (9/21) were right sided infective endocarditis. Complications included heart failure in 47.6% cases (10/21), neurological events in 28.6% (6/21), systemic embolic events in 14.3% (3/21), aortic pseudoaneurysm in 9.5% (2/21), and left ventricle aneurysm in 4.8% (1/21). Of the SAIE patients, 5 cases had received antibiotic therapy only and 4 died; 16 had received antibiotic therapy combined with surgery and 1 died; the in-hospital mortality were 23.8% (5/21). Cause of death included heart failure, embolism, and refractory infection. Meanwhile, the mortality of non-SAIE were 9.3% (13/140).

CONCLUSION:

SAIE is a very serious infective disease, with elevated in-hospital mortality. Timely surgery is recommended in these cases, when possible, before the occurrence of complications.
PATHOGEN SPECTRUM AND ANTIBIOTIC RESISTANCE OF BACTERIAL MENINGITIS OF CHILDREN: A 6 YEARS RETROSPECTIVE STUDY
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Background and aims

Bacterial meningitis remains one of the most dangerous infectious diseases among children. Pathogens spectrum varies at different regions. Here we conducted a retrospective study to identify the composition and antibiotic resistances of the pathogens of children meningitis in our hospital.

Methods

We retrospectively collected clinical and microbiological data of the patients with bacterial meningitis admitted to the neonatal or pediatric department of our hospital during 2011 to 2017. The composition and antibiotic susceptibility of the pathogens were analyzed.

Results

Total 42 isolates were collected, including 29 G¹, 12 G⁻ bacteria and 1 U. urealyticum. S. agalacitae (15/42), S. pneumoniae (13/42) and E. coli (10/42) rank top 3 of the isolated pathogens. For those with early-onset meningitis (age<72 hours) S. agalacitae was the main pathogen (3/3), for those aged between 4days to 1 month S. agalacitae (9/21) and E. coli (9/21) were the main pathogens. S. pneumoniae (13/18) was the dominant pathogen of meningitis in children >6 months. Antimicrobial susceptibility tests indicated that all isolates of S. pneumoniae were sensitive to levofloxacin and vancomycin, and all isolates of S. agalacitae were sensitive to penicillin G, ampicillin and vancomycin. Piperacillin/tazobactam and amikacin were the most effective antibiotics to E. coli.

Conclusions

S. agalacitae, S. pneumoniae and E. coli were the common pathogens of children meningitis. For empirical therapy Penicillin G is recommended for early-onset disease and penicillin G and piperacillin/tazobactam were recommended for those aged 4 days to 1 month. Levofloxacin is recommended for those aged >6 months.
PERSONALIZED IDENTIFICATION OF DIFFERENTIALLY EXPRESSED PATHWAYS IN PEDIATRIC SEPSIS

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Background and aims

We use iPAS based on the comparison of one sepsis sample with many accumulated normal samples (ANS). This is a biologically intuitive guideline to interpret a single sample that even lacks cohort data, which is absolutely different from the traditional gene expression analysis. The new method covers four steps: data processing, gene-level statistics, iPAS and a significance test.

Methods

Based on Kauffman’ attractor theory, attract was used to screen differentially expressed pathways related to pediatric sepsis, and attract was also used to test.

Results

Through attractor and Kyoto Encyclopedia of Genes and Genomes (KEGG) functional analysis, 277 enriched pathways were selected as attractors. There are 81 pathways with P<0.05 and 59 pathways with P<0.01. Distribution outcomes of screened attractors were mainly consistent with total data showed by the 6 classifying parameters, which suggested the efficiency of attractors. Cluster analysis of pediatric sepsis using the iPAS method identified 7 pathway clusters and 4 sample clusters. Basically, in most pediatric septic samples, core pathways can be detected differences from ANS. Therefore, iPAS is analyses gist of individual medical treatment in pediatric sepsis.

Conclusions

A novel pipeline that identified the dysregulated attractors in individuals of pediatric sepsis was constructed. Attractors can be markers in identification of pediatric sepsis. iPAS can be useful analysis gist of individual medical treatment in pediatric sepsis. We hope the constructed process can help in the personalized interpretation and can be efficient in the upcoming era of personalized medicine.
THE CULTURE POSITIVE RATE OF BORDETELLA PERTUSSIS, DISTRIBUTION PATTERNS OF GENETYPES AND THE EPIDEMIC SITUATION OF VIRULENCE GENES FROM PEDIATRIC PATIENTS IN CHINA

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Background and aims

This study was aimed to summarize the culture positive rate of Bordetella pertussis from pediatric patients in China, to investigate the distribution patterns of genotypes and the epidemic situation of virulence genes in Bordetella pertussis, and via monitoring of the sensitive tests of commonly used clinical drugs, in order to guide the rational use of antibiotics in clinical practice.

Methods

We have collected the nasopharyngeal swabs from 411 suspected Bordetella pertussis infected pediatric cases from 2016.6 to 2017.6. The selected subjects showed clinical manifestations including typical paroxysmal or spasmodic cough with a protracted course, and invalid use of antibiotic. Nasopharyngeal swabs were used for culture and identification of Bordetella pertussis. The blood routine test, interleukin (IL-6) and procalcitonin (PCT) were detected for all the children, and the chest X-ray findings were also observed. After pure culture of Bordetella pertussis, the drug sensitive tests (E-test) of erythromycin, azithromycin, clarithromycin and compound sulfamethoxazole were performed and recorded the minimum inhibitory concentration (MIC). The MLST genotypes and 7 virulence genes (ptxP, ptxA, prn, fim2, fim3 and tcfA) were analyzed by PCR amplification and sequencing for all isolates.

Results

Based on virulence genes, two main patterns were identified that 29 strains (55.8%) were ptxA1/ptxC1/prn1/fim2-1/tcfA2/ptxP1/fim3-1 and 19 strains (36.5%) were ptxA1/ptxC2/prn2/fim2-1/tcfA2/ptxP3/fim3-1, while only 2 strains carried fim3B gene.

Conclusions

The unvaccinated DPT is a risk factor for pertussis infection, only 19.2% patients with DPT vaccination history. Avoiding infection and transmission of Bordetella pertussis are critical before and during the vaccination intervals for children.
SEVERE BACTERIAL INFECTIONS ANALYSIS OF HOSPITALIZED SEPSIS CHILDREN FROM 2016.3-2017.5
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Background and aims

To analyse the epidemiology of sepsis children. Retrospective study with 14-months follow-up.

Methods

A total of 181 general hospitalized children from 2015.3 to 2017.5 were enrolled. We collected the clinical information such as blood, the nasopharyngeal aspiration fluid and serum samples to value liver and heart function, and for multi-pathogen detection. we compare a new marker presepsin with procalcitonin (PCT), c-reactive protein (CRP) and white blood cell (WBC) in diagnosis; ALT, AST, CK-MB to measure the multiple organ function. Adenovirus (ADV), respiratory syncytial virus(RSV), parainfluenza virus type I-3 (PIV-1-PIV-3) were detected by direct immuno- fluorescence assay. Quantitative ELISA was adopted to detect the specific antibodies of mycoplasma pneumoniae (MP), chlamydia pneumoniae (CP) and legionella pneumophila(LP). Then we compared these in the last 14 months.

Results

1. The rate of sepsis hospitalized children accounted for general hospitalized children in the spring from 2016.3 to 2017.5 is 5.83%. 2. 27 children were infected by virus, among them EBV and CMV were in the majority. The percentage distributed among the age groups were listed below: 8.79%(0-0.5y), 34.78%(0.6-1y), 26.09%(1-3.9y), 17.39%(4-6.9y) and 13.04% (7-14y). The results showed 8 children were found bacteria culture positive (4.42%), 11 children were infected with MP (6.08%).

Conclusions

Among children suffering from sepsis the age between six months to three years group are in the majority, this age group is also more common with viral infection and blood culture positive. This may be caused by the immune system or the environment. Liver function, myocardial injury between age groups were of no significant difference.
STUDY OF IODOTHYRONINE DEIODINASE TYPE I AND TYPE III MRNA LEVEL AND ACTIVITY IN PERIPHERAL BLOOD CD4+T CELLS OF MICE IN ENDO TOXEMIA

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Background and aims

To explore the effect of endotoxemia on triiodothyronine(T₃), thyroxine(T₄) and mRNA level and activity of iodothyronine deiodinase type I(D1) and type III(D3) of peripheral blood CD4+T cells and its mechanism.

Methods

60 mice were divided into 2 groups randomly and the mouse model of endotoxemia was replicated in the LPS group. Blood samples were collected with CD4+ T cells separated. Serum T₃ and T₄ levels were assayed with RIA, D1 and D3 mRNA levels were measured with Real-time PCR, the activities of D1 and D3 were measured with ion exchange chromatography combined with radioactive substrate analysis. The data were statistically analyzed by SPSS13.0 software package.

Results

Statistical differences of T₃, D1 and D3 mRNA levels and activities of the 2 groups were found (t=7.68, 20.35, 18.42, 24.59, P<0.01), while there was no statistic difference between the statuses of T₄ of the 2 groups(t=2.00, P>0.05). Serum T₃ concentration of LPS group was obviously lower than the one of control group, comparatively, D1 mRNA level and activity of LPS group were obviously lower and D3 mRNA level and activity of LPS group were obviously higher than that of control group.

Conclusions

It is possible that euthyroid sick syndrome happens in endotoxemia episodes, and the changes of D1 and D3 mRNA levels and activities are critical.
BACTERIAL MENINGITIS CAUSED BY ESBL-PRODUCING KLEBSIELLA PNEUMONIAE IN A 37-DAY-OLD INFANT: A CASE REPORT
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Background and aims

Infection caused by ESBL-producing K. pneumoniae has become an emerging health threat worldwide due to the limited therapeutic and high mortality. Although some cases have been reported, meningitis caused by ESBL-producing K. pneumoniae is very rare.

Methods

We studied the clinical features, treatment and outcome of ESBL-producing K. pneumoniae meningitis in a 37-day-old male infant.

Results

A 37-day-old boy was admitted to the Emergency Department due to fever and seizure. He had received two days noninvasive mechanical ventilation after birth. The white blood cells count in cerebrospinal fluid was 1038/mm³ (85% of polymorphonuclear cells), glucose was 0.01mmol/L, protein was 3.987g/L, and ESBL-producing K. pneumoniae was detected on culture. Intravenous meropenem was administrated. After seven days treatment, the CSF culture revealed ESBL-producing K. pneumoniae again, and then continuous infusion of meropenem (10ml/h) was administrated for six weeks. At day 29, CSF culture was negative, but the counts of WBCs in CSF were abnormal, then intrathecal amikacin (5mg daily) was added for a total duration of six days. Despite the active antibiotic therapy, the patient developed progressive increase in head circumference, and at day 50, magnetic resonance imaging (MRI) revealed supratentorial hydrocephalus with periventricular edema. Visual evoked potentials showed a loss of cortical response for each eye. External ventricular drain was managed. The patient had an improvement of vision and without seizure during six months of follow-up.

Conclusions

Continuous infusion of meropenem can be effective in the treatment of ESBL-producing K. pneumoniae meningitis.
CLINICAL CHARACTERISTICS OF KLEBSIELLA PNEUMONIAE MENINGITIS IN CHILDREN
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Background and aims

*Klebsiella pneumoniae* meningitis in children is rare. The aim of this study was to describe the clinical and microbiological characteristics, therapy and outcome of pediatric patients with *K. pneumoniae* meningitis.

Methods

We conducted a retrospective at Beijing Children’s Hospital from January 2007 to May 2017. Data were collected from medical records and microbiology laboratory database.

Results

A total of sixteen patients (twelve males and four females) were identified. The median age was 1.48 months (range, 0 to 110 months. Almost all the patients had healthcare associated meningitis, while only one patient had community-acquired meningitis. The frequent concomitant predisposing factors were previous neurosurgery (four cases) and premature (three cases). Fever and seizures were the most frequent symptom. Seizures were more likely to present in patients without surgery history. Concomitant bacteremia presented in 75% of the patients. Two ESBL-producing isolates and two carbapenem-resistant isolates were observed. Three patients did not receive appropriate empirical antibiotic treatments. However, all the patients received appropriate definitive treatments. The mean duration of antimicrobial treatment was (40.5+17.0) day. Seven patients (43.8%) developed neurologic complications. All patients survived and discharged after medical and surgical treatments.

Conclusions

*K. pneumoniae* meningitis is more likely to happen in premature and patients who have received neurosurgery. Bacterial meningitis caused by multidrug resistant *K. pneumoniae* has emerged.
UNUSUAL PENICILLIOSIS: FIRST CASE REPORT OF SYSTEMIC INFECTION DUE TO TALAROMYCES PURPUROGENUM IN SOUTH AMERICA

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²Regional Hospital of Cusco, Infectious Diseases, Cusco, Peru

Background and aims

Penicilliosis is an emergent opportunistic disease. We present a case of systemic infection due to Talaromyces purpurogenum, formerly known as Penicillium purpurogenum, is extremely rare the infection due to species other than Talaromyces marneffei formerly P marneffei.

Methods

We report the case of a 15 year old patient HIV seronegative that was seen five days after suffering a cutaneous lesion with increased leg volume and purulent discharge. Then he developed features of systemic infection with respiratory distress and opacities in the lung bases bilaterally at the Xray. The patient was admitted at the ICU with altered level of consciousnes being defined as sepsis due to skin infection. Three weeks after antibacterial treatment with ceftazidime and vancomycin in addition to antymycotic therapy with Amphotericin B showed favorable evolution and finally was discharged and cited as outpatient.

Results
Talaromyces purpurogenum was isolated in the culture of the bronchial secretion at the National Institute of Health in Peru through culture and taxonomic recognition.

Conclusions

According to our search this is the first reported case in South America, a case was reported last year in a mieloma patient, we found less than 5 cases reported overall until now in humans. For the purpose of the report we maintained the name Penicilliosis for this disease that is a common mycosis among AIDS patients in Southeast Asia.
Clinical Burden of Typhoid Fever in a Rural Tertiary Hospital in Nigeria

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Background and Aims

Approximately 21.5 million infections and 200,000 deaths from typhoid fever occur globally each year, making the disease one of the most serious infectious disease threats to public health on a global scale. However, these estimates were based on little data, especially from Africa with very scant data from rural areas. This study was aimed to determine the prevalence, outcome, demographic and clinical features of Typhoid fever in a rural tertiary hospital in north western Nigeria.

Methods

This paper presents an analysis of secondary data obtained from a rural tertiary hospital in north western Nigeria over a period of one year (1st January to 31st December 2016). Results were presented as means with standard deviation, ratio, tables, figures and Chi-squares with p values.

Results

A total of 733 children were admitted from 1st January to 31st December 2016, out of which 78 (10.6%) had a diagnosis of typhoid fever. The mean age at presentation was 8.1 ±3.4 years with the majority aged more than 5 years. More males were affected with M: F of 1.6:1. Thirty-eight (48.7%) were discharged home, 3(3.8%) left against medical advice, 3(3.8%) died and Thirty-four (43.6%) of the subjects had an intestinalal perforation at presentation. Males older than 5 years were more likely to present with perforation than females (p=0.96).

Conclusions

Typhoid fever is prevalent in this rural community and almost half of the subjects presented with complication. Adequate preventive measures should be taken to curve this menace.
ACUTE DIARRHEA L DISEASES IN UNDER FIVE YEAR OLD CHILDREN: EXPERIENCE OF A RURAL TERTIARY HOSPITAL IN NORTH WESTERN NIGERIA

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Background and aims

Acute Diarrheal diseases is estimated to be the third cause of admission among inpatients admission and 5th leading cause of mortality in children less than five years. diarrhea episodes are reported to be more frequent among rural children than their urban counterparts.

This study is aimed to determine the prevalence and outcome of children less than five years of age in a rural tertiary hospital in north western Nigeria.

Methods

This paper presents an analysis of secondary data obtained from a rural tertiary hospital in north western Nigeria over a period of one year (1ST January to 31ST December 2016). Results were presented as means with standard deviation, ratio, tables, figures and Chi-squares with p values.

Results

During the study period, 733 children were admitted; of which 71 were suffering from diarrhea, thus giving a diarrhea prevalence of 9.7%. Forty-five (63.3%) were males and 26 (37.7%) female with M:F 1.73:1. The mean age was 16 ± 4.5 months. A majority of children were aged less than 24 months.

Sixty-five (91.6%) were discharged home, 4(5.6%) left against medical advice, 2(2.8%) died. Sex, age and season of the year have no significant effect on the mortality and morbidity related to diarrhea.

Conclusions

The burden of diarrheal diseases in this study is quiet high and males are more affected. Simple and cost effective methods to prevent diarrheal morbidity and mortality among children should be strengthened.
THE INCIDENCE OF ZIKA VIRUS IN BRAZILIAN CHILDREN WITH MICROCEPHALY:
PRELIMINARY RESULTS OF A COHORT STUDY IN JUNDIAI, BRAZIL

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Background and aims: The recognition and rapid spread of Zika virus infection (ZIKV) from February
to November 2016 led to the declaration of international emergency by the WHO. There is mounting
evidence linking ZIKV infection during pregnancy and a spectrum of congenital malformations and
neurological syndromes known as the congenital Zika Syndrome.

Methods: We report the preliminary results of a prospective cohort study that is being undertaken at
the University Hospital of Jundiaí Medical School since March 2016, which aims to determine the
incidence of ZIKV infection among pregnant women and the incidence of microcephaly in their
offspring. All biological samples (blood, urine, saliva and cerebrospinal fluid) were tested for ZIKV
using real-time PCR and/or ELISA.

Results: Microcephaly (head circumference < -2 SD according to the Intergrowth charts) was detected
in 25 of 659 children (3.8%). The total of ZIKV positive mothers and newborn was 6.3% (44/693) and
3.0% (20/659), respectively. Agreement of M/NB RT-PCR (positive results for both mother (44/693-
6.3%) and newborn (20/659-3.0%) was detected in only three (12.0%) of the 25 tested pairs. The
characteristics of the children and their mothers are shown in Table 1.
Table 1. Characteristics of children born with microcephaly and their mothers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mothers</th>
<th>Newborns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (median, IQR)</td>
<td>25±6.03y (16-40y)</td>
<td>28.9 - 31.5cm</td>
</tr>
<tr>
<td>Adolescent mothers, N (%)</td>
<td>5 (25%)</td>
<td>5(25%)</td>
</tr>
<tr>
<td>Symptoms during pregnancy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myalgia</td>
<td>2 (20%)</td>
<td></td>
</tr>
<tr>
<td>Pruritus</td>
<td>1 (5%)</td>
<td></td>
</tr>
<tr>
<td>Prematurity, N (%)</td>
<td></td>
<td>2477 ± 379 g (1905-3075g)</td>
</tr>
<tr>
<td>Mothers(M) RT-PCR ZIKV(+)</td>
<td>2 (8.0%)</td>
<td>3 (12.0%)</td>
</tr>
</tbody>
</table>

**Conclusion:** ZIKV RT-PCR positivity among mothers of babies born with microcephaly in the cohort was low. Half of the babies born with microcephaly also had low birth weight and 25% were born from adolescent mothers. These preliminary results of a cohort study looking into the effects of ZIKV infection during pregnancy are compelling. We await further results of this ongoing study to better understand the long-term impact of this emergent disease.

Prevalence of Intestinal Parasites in Children Population of Ixtlahuaca, State of Mexico, Mexico
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Introduccion/Objective: Intestinal parasites are a major problem that Mexico faces. Pre-primary and primary school children are the most vulnerable population. These infections are high in warm and humid climates, where poor sanitary conditions exist. The objective of this study is to determine the prevalence of intestinal parasites in the population of Ixtlahuaca, Mexico.

Methodology: For the evaluation of the presence of parasites, three feces samples were carried out to 138 children using coproparasitoscopic techniques to identify structures of the most frequent parasites in Mexico; Which were the Faust test and the Richie techniques, in addition to using Kinyoun staining to determine oocysts.

Results: Of the total population (138 children), we found that 104 children (75% of the population) were parasitized and only 34 children (25%) were negative. Of the positive children it was observed that 66% were infected by more than two parasites, while the remaining 34% had only one. It should be noted that the parasites with the highest incidence were Cryptosporidium sp. with 63% and Hymenolepsis nana with 40%. It is important to mention that the most frequent parasitic relationships were Cryptosporidium sp. and E. hystolitica covering 28% of the total combinations.

Conclusions: We observe that although the parasites are often asymptomatic, they are there and are not diagnosed; in addition, there is a relationship between the different intestinal parasites, some children can be infected by two or more species. A gap in the diagnosis is the possible symptomatology that can be confused with other infectious agents like bacteria and that, as expected, the sanitary conditions are a determinant of the parasitosis in this municipality.
EVALUATION OF ORAL CALCIUM EFFECT ON DURATION OF ACUTE DIARRHEA IN CHILDREN IS IT THE TIME FOR ORS FORMULATION TO BE UPDATED?
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Background and aims

Intestinal calcium-sensing receptor (CaSR) is an antidiarrheal receptor system that if activated can reverse the process of both secretory and inflammatory diarrheas. The aim of this study was to evaluate the effect of oral calcium on the duration of acute diarrhea in children.

Methods

This single blind randomized clinical trial was performed from 2014-2015 at Ali asghar Children’s Hospital, Tehran, Iran. Totally, 120 patients aged one month to 12 years old with diarrhea that required hospitalization were enrolled in this study. The patients were divided equally in the case and control groups. The case and the control group received calcium gluconate 10%, 0.5cc/kg/day divided in three doses and distinct water as placebo respectively.

Results

The mean age in the case and control groups was 26.43± 3.74 and 20.84± 2.70 months respectively and the difference was not significant (P-value=0.228). Among case and control groups, 37(59.7%) and 38(61.3%) cases were male respectively and there was not any significant difference between the two groups (P-value=0.854). The duration of diarrhea in the control group was 6.71 ± 2.44 whereas in the case group was 5.27 ± 2.01 days, indicating the shorter duration of diarrhea in the case group (P-value=0.001)

Conclusions

Oral calcium gluconate might shorten the duration of acute diarrhea, so it might be an adjunctive to the standard therapy of acute diarrhea. Either the formulation of the ORS should be updated with adding calcium needs more evaluation in the future.
ANTIBIOTIC SUSCEPTIBILITY PATTERN OF S.PARATYPHI IN A TERTIARY CARE HOSPITAL, INDIA
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Background and aims

BACKGROUND: Enteric fever is a major public health problem in tropical countries including India. Distribution of paratyphoid fever is 0.25 illnesses for every typhoid fever. There have been reports of changing antibiogram and age wise incidence.

AIMS: To analyze the antibiotic sensitivity pattern and changing trends in antibiotic resistance of culture positive paratyphoid fever.

Methods

It is a retrospective study of case records of all children (196 cases) in the age group of 0-18 years diagnosed with culture proven paratyphoid fever, at Manipal hospital, Bangalore, India, between November 2008 to June 2016.

Blood culture was done by BacT/Alert 3D system. Susceptibility to antimicrobial drugs was tested by the disc diffusion according to Kirby Bauer method.

Results

Of 826 cases of culture positive enteric fever, 630 were S. enterica serovar Typhi (76.2%) and 196 were Paratyphi A strains (23.7%).

8% of the paratyphoid cases were below 2 years of age.

All strains were susceptible to third generation cephalosporins and azithromycin. Susceptibility to ampicillin (99.5%), chloramphenicol (100%) and cotrimoxazole (100%) is resurging. Resistance to nalidixic acid (96.43%) has been increasing.

Conclusions

S. paratyphi continues to remain susceptible to third generation cephalosporins. Resurgence of susceptibility to first generation antibiotics is noteworthy. Local antibiograms improve patient care, and reduce the treatment cost in developing countries, improving the compliance.

In view of high prevalence of paratyphoid fever in children, it may be advisable to strengthen vaccination at an early age and develop a bivalent vaccine to cover paratyphoid.
Background and aims

Background: Helminthes infestation cause significant morbidity that include growth retardation, impaired cognitive function, anaemia and school absenteeism. Socio-demographic factors contribute to helminthes.

Aims: describe the prevalence and pattern of helminthic infestation among adolescents in an urban setting and associated factors.

Methods

cross sectional multistage among students from 10 Junior Secondary schools 3 arms (1, 2 and 3) each, questionnaire was used to collate data. Stools samples collected were analyzed using modified Kato-Katz method.

Results

Of 1185 students recruited, 1081(91.2%) stool samples were analyzed. Ages 10 to 15 years; mean±SD 12.30±1.26 years. 347(32.1%) aged 13 years, while 15 years (37; 3.4%). Male: Female were 496 (45.9%) and 585 (54.1%) respectively; 651(60.2%) lower socio-economic class and 38(3.5%) upper class. 504(46.6%) had one helminthes ovum in stool, four different intestinal helminthes were identified: Ascaris lumbricoides, 242 (22.4%) mean feacal count 645.42 eggs per gram, (95% CI: 838.39-1563.13); Hookworm, 219 (20.3%); Trichuris trichiura, 121 (11.2%), and Schistosoma mansoni, 38 (3.5%). Helminthes was highest among females (56.9%); those aged 13 years (31.3%); lower socioeconomic status (58.1%); and Ascaris lumbricoides (135; 55.8%) in lower class; helminthes among socio-economic classes was not significant (p>0.05). 630(58.3%) reported access to regular clean water; 161(14.9%) washed hands always; and rarely 551(51.0%); Odds of infestation was significant for the rarely or sometimes wash hands (OR; 1.352, p=0.016).

Conclusion: helminthes infestation was associated with gender, younger adolescents and handwashing.

Key words: Handwashing; Helminthes; School, adolescents; Federal Capital Territory (FCT), Abuja.
ENTECAVIR TREATMENT IN CHILDREN WITH CHRONIC HEPATITIS B VIRUS INFECTION

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Background and aims

The aim of this study was to investigate the treatment response of entecavir (ETV) in children with chronic hepatitis B who acquired infection perinatally.

Methods

A total of six children (median aged 4.33 years, three girls and three boys), with HBV DNA > 500cps/ml, HBeAg seropositive > 6 months, ALT > 50 U/L, were received ETV therapy. Another 20 CHB patients untreated with ETV matched for age, sex, ALT levels, and HBV DNA, HBeAg status were recruited as the control group. We test ALT, HBV DNA, HBeAg/anti-HBe every 2 weeks for at least 52 weeks.

Results

ETV-treated patients achieved rapid ALT normalization and HBeAg seroconversion, they had a greater chance of achieving undetectable HBV DNA levels than the control group.

Conclusions

ETV effective alternative antiviral agent in the treatment of children with CHB.
RESULTS ANALYSIS OF 2270 PRIMARY DETECTION OF BRUCELLOSIS

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Background and aims

Objective To analyze the serological results of brucellosis in Beijing Tropical Medicine Institution (BTMI) from 2013-2014, in order to provide laboratory basis for control and prevention of Brucellosis.

Methods

Serological detection (RBPT) of suspected brucellosis case in the outpatients department in BTMI was conducted and the results were analyzed.

Results

totally 2270 suspected cases of brucellosis were detected and 244 positives were found with the positive rate of 10.7%, among them, the serological positive rate of man was 13.3% that of female was 6.8%. Among age groups, the highest serologic positive rate (15.6%) appeared in 50+ group, the lowest one (0.9%) appeared in 70+ group. Significant seasonal peak were observed in July (15.2%), valley in Mar (6.8%).

Conclusions

at present brucellosis epidemic in Beijing is stable in last two years and effective measures should be taken to control the prevalence of brucellosis.
IMMUNODEFICIENCY-ASSOCIATED PARACOCCIDIOIDOMYCOSIS

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Introduction: Paracoccidioidomycosis is a systemic mycosis endemic to Latin America caused by the fungus Paracoccidioides brasiliensis. Acute or subacute forms are observed in children. If untreated, it can disseminate throughout the body and be fatal. During infection, CD4 Th1 lymphocytes synthesize cytokines, such as IFN-γ, TNF-α and IL-12, which protect from dissemination.

Report: The patient, a 14 year-old female student born in São Paulo, started to feel pain in her left wrist. Eight months later, she presented with ulcerated lesions on her face, trunk, and arms, cervical and axillary adenomegaly, hip pain, chest pain, fever, and weight loss. Eleven months after onset of these symptoms, Paracoccidioides brasiliensis was isolated from a skin lesion biopsy. Despite receiving oral itraconazole and intravenous sulfamethoxazole + trimethoprim for 14 days, the patient continued to experience significant hip pain, chest pain, and dyspnea. She was admitted to the Instituto de Infectologia Emilio Ribas where CT scan revealed hepatosplenomegaly and osteolytic lesions in the pain region. The patient was started on amphotericin for 40 days with satisfactory response, and was discharged with itraconazole for 18 months.

Disseminated disease in a previously healthy child required screening for immunodeficiency. Result showed an IL-12/23 (CD212) receptor beta-1 deficiency. Gamma interferon had to be administered.

Discussion: In disseminated and severe cases of Paracoccidioidomycosis, treatment should be intravenous with amphotericin or sulfamethoxazole + trimethoprim until stabilization. Infectious and/or non-infectious comorbidities usually occur in patients with Paracoccidioidomycosis, and should be investigated.