

Pediatric Necrotizing Pneumonia By Streptococcus Pneumoniae Serotype 3 In A 13-valent Vaccinated Child

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INTRODUCTION

Necrotizing pneumonia occurs infrequently in children but may be associated with significant morbidity and mortality. If not adequately treated necrotizing pneumonia may lead to complications including bronchopleural fistula, empyema, respiratory failure, septic shock and death

Due to the importance of the disease several vaccines have been developed to protect against invasive infections but currently only a 13-valent PCV vaccine exists. Rather than 84 serotypes have been isolated.

CASE REPORT

A previous healthy 3 year old young boy from Italy (South-american mother and Iranian father), fully vaccinated was admitted to the A&E department with an history of ten days fever, cough and vomiting treated by NSAID's and paracetamol without benefit. He complained about fever, cough, rhinorrhea, shaking chills and left emithorax pain. He was moderately tachypnoic (RR 38 b/min) with mild acute respiratory distress. On arrival the patient was crying, uncomfortable, RT 40°, HR 170 bpm, haemodynamically stable, So2 92% in RA increased with oxygen supplement. Respiratory examination was significant for tachypnoea, left side expiratory wheezing and rhonchi. A chest X-Ray has shown left upper and inferior pneumonia with pleural effusion. A chest drain was inserted by US guide under GA with LMA and purulent fluid coming out from drainage.

The child has been admitted in PICU and sedated and intubated and mechanically ventilated due to severe respiratory distress.

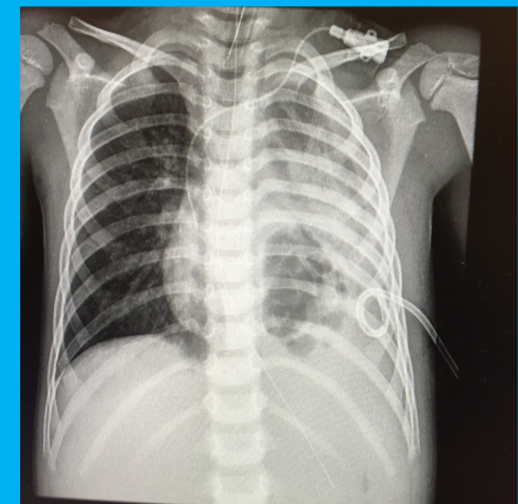
A thorax CT-scan was performed and has shown left lobar pneumonia and cavitory lesions involved partially the right lung.

A diagnosis of necrotizing pneumonia carried by S.Pneumoniae has been made after blood exams went back positive for PCR S. Pneumoniae serotype 3. An IV antimicrobial therapy was started with Linezolid, Gentamycin and Piperacillin/Tazobactam. According with the surgeons Urokinase 40000 UI lavages were administered through the chest drain for 4 days and two time a day.

A multidisciplinary meeting took place about need to perform partial lobal pneumonectomy but at day 7 the child started to improve his respiratory gas exchange and we decided for conservative management.

The child was extubated at day 8 and received NIV by full face mask.

After 11 days in PICU the patient was trasferred to the pediatric ward and after one month he was completely recovered and discharged home.



DISCUSSION

Streptococcus Pneumoniae is a gram positive, alpha- or beta-hemolytic, facultative anaerobic member of the pneumococcus's genus. It's a significant pathogenic bacterium resides asymptotically carriers typically colonizing upper respiratory tract. In susceptible individuals (children and elderly) it may become pathogenic and cause important disease. Pneumococcal disease is endemic worldwide with a total incidence of 1-5/100 person/year. Most, if not all, serotypes are able to cause serious disease in humans. More than 84 serotypes have been isolated in pneumococcal strains in patients with invasive infections; particularly serotype 3 accounts for 7-8% of the total infections carried out by S. pneumoniae.

The current 13-valent polysaccharide vaccine has demonstrated to confer about 70% of protection against invasive pneumococcal disease, with no protection against some serotypes. Serotype 3 remains a significant cause of morbidity and mortality despite its inclusion in the 12-valent pneumococcal conjugate vaccine (PCV 13).

That's why WHO recommends routine childhood pneumococcal vaccination. Necrotizing pneumonia is quite rare in children and the diagnosis is difficult with no predisposing risk factors to necrosis have been detected in literature and its mortality is no different compared with pneumonia without necrosis.

Necrotizing pneumonia describes a complication in pneumonia with an underlying destruction and necrosis of the lung parenchyma. The incidence in children, although low, seems to be rising between 5 and 10% of cases of community acquired pneumonia.

The majority of reported cases were previous healthy patients and many were vaccinated against pneumococcal infection suggesting that the virulence is more important than host susceptibility. Most serotypes are suspected to be important in pathogenicity because the capsular polysaccharide of serotype 3 may bind complement factor H, downregulating the complement cascade and thereby prevent phagocytosis.

Due to the infrequency of necrotizing pneumonia infectious disease immunological consultants may be involved to help management and surgical decision needs to be made about surgical or conservative management.

In the case we present an initial decision about lobal pneumonectomy was made to try to fight the infection and save the right lung but the child rapidly improved from respiratory and infection point of view and conservative management was carried out successfully.

References

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