



Bubbles in the Chest, Another Complicating Pneumonia!

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Abstract:

Community acquired pneumonia remains a major cause for hospitalization of infants despite the availability of pneumococcal conjugated vaccines. We are still facing invasive and difficult to treat cases of pneumonias that could be life threatening especially in immunocompromised patients. Imaging studies mainly high resolution CT scan should be requested whenever dealing with poorly resolving pneumonia for better specification of possible complications and to implement the appropriate treatment as soon as possible.

Key words: Infant, Pneumococcal Vaccines, Pneumonia, Streptococcus pneumoniae, Tomography.

Introduction

Pneumonia in children is considered an invasive disease that should be treated promptly and adequately without delay. In spite of availability of effective parenteral antibiotic and the pneumococcal conjugated vaccine that cover the most prevalent and dangerous 13 serotypes of streptococcus pneumoniae, we still encounter in our practice severe pneumonias that ended up with different types of complications as reported in our case below.

Case Report

A previously healthy eleven month-old-boy was referred to our hospital for a history of upper respiratory tract infection of minimal symptomatology. This was accompanied by persistent fever of more than 10 days that prompted his primary physician to order a chest

X-ray and blood tests which revealed a huge consolidation pneumonia of the right upper lobe [Fig.1], and leukocytosis with increased C-reactive protein. Child was active with no cough, dyspnea, cyanosis or decreased oral intake. But given the family history of death of their four-year old child of pulmonary aspergillosis two years ago, he was admitted for further evaluation and management. His past history was not suggestive of recurrent fever, respiratory symptoms, or tuberculosis exposure and he had received 2 doses of 13-valent pneumococcal conjugate vaccine.

He was admitted to regular pediatrics floor and started on intravenous ceftriaxone 100 mg/kg/day and oral azithromycin 10 mg/kg/day. He had normal color and oxygen saturation on room air, leukocytosis: 30,000/mm³; CRP: 280 mg/dL (normal

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value < 10 mg/dL). After five days of hospitalization he continued to have high grade fever up to 40 degree Celsius and he started to have productive cough but continued to have stable hemodynamic and physical conditions. Further laboratory tests revealed normal immunoglobulin quantification levels and negative PPD test for screening of latent tuberculosis. A second chest X-ray [Fig.2], revealed a new cystic enlarging lesion in the existing consolidation which prompted us to order an urgent contrast CT scan of chest that revealed multiple cystic lesions of thin wall resembling pneumatoceles [Fig.3]. At this time it was decided to broaden our antibiotics regimen to cover the most culprit pathogens such as resistant pneumococci, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and Anaerobes; so he received triple antibiotics course that included intravenous meropenem, vancomycin and metronidazole.

Two days after the new therapeutic regimen, the patient was afebrile with progressive decrease in WBC and CRP. His serial chest X-rays revealed improvement of the consolidation pneumonia and pneumatoceles size, [Fig.3,4]. He was continued on intravenous antibiotics for twenty days and one week oral cefibuten with no reported complications. His follow up chest X-ray at two weeks after discharge, revealed disappearance of pneumatoceles [Fig.5].



Fig.1: Chest X-ray suggestive of consolidation pneumonia of right upper lobe.

Discussion

The incidence of community-acquired pneumonia (CAP) in children is estimated to be 3% to 4%



Fig.2: Chest X-ray showing cystic lesion in right upper lobe.



Fig.3: CT scan chest showing cystic lesions in right lung.



Fig.4: Follow up chest X-ray showing partial clearing of right upper lobe pneumonia and shrinking of cystic lesion.

[1]. Majority of these patients can be managed effectively by primary care, though the thresholds for referral and admission to hospital in those less than 6 months of age should be lower [2]. Hospitalization rates for CAP in children range from 9.5% to 42% [1] and the median time to resolution of symptoms in children with oxygen saturations of >85% at the time of admission is 9 days [3]. Complicated pneumonias in children are most commonly caused by bacterial pathogens, such as *Streptococcus pneumoniae* and *Staphylococcus aureus* [4], but cultures are reported to be negative in 45% to 89% of cases [5].

Treatment failure may be due to antibiotic resistance or because CAP is the first presentation of an underlying condition such as cystic fibrosis, immunodeficiency or congenital thoracic malformation (CTM). As seen in our reported case where a typical lobar pneumonia failed to respond to the routinely indicated third generation cephalosporin and had a more severe course of tissue necrosis and cystic lesions that required a more intensive course of broad spectrum antibiotics. He was further investigated to seek any secondary underlying disease that could be the inciting event. The recognized sequelae of pediatric CAP, necrotizing or cavitary pneumonia was first, described in 1994 and has recently been shown to complicate up to 20% of childhood empyemas [6]. The primary causative pathogen was thought to be *S. aureus* but *S. pneumoniae*, [6], is now the predominant cause, although *M. pneumoniae*, methicillin-resistant *S. aureus* and PVL strains of *S. aureus* [7] have also been implicated. Diagnosis is usually made on CT. Pneumatocoles are common in necrotizing pneumonia as one-way passage of air into the peripheral airways occurs following necrosis of bronchioles and alveoli [8]. The majority of pneumatocoles (more than 85%) resolve spontaneously, partially or completely over weeks to months without clinical or radiographic sequelae [9] as occurred in our reported case which



Fig.5: Normal findings on follow up chest X-ray.

had clinical and radiological evidence of almost complete resolution within six weeks of the primary presentation and antibiotic initiation.

Conclusion

Community acquired pneumonia does not always have a simple course and persistence of fever or deterioration should prompt the treating physician to search for underlying complications or a hidden secondary cause. Contrast CT scan of chest is a helpful diagnostic imaging option that should be performed as soon as possible in case of difficult to treat pneumonias.

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