

Community-acquired pneumonia and empyema caused by *Pseudomonas stutzeri*: a case report

Mehmet Köse¹, Mustafa Öztürk¹, Tamer Kuyucu¹, Tamer Güneş¹
Mustafa Akçakuş¹, Bülent Sümerkan²

Departments of ¹Pediatrics, and ²Microbiology, Erciyes University Faculty of Medicine, Kayseri, Turkey

SUMMARY: Köse M, Öztürk M, Kuyucu T, Güneş T, Akçakuş M, Sümerkan B. Community-acquired pneumonia and empyema caused by *Pseudomonas stutzeri*: a case report. Turk J Pediatr 2004; 46: 177-178.

Pseudomonas stutzeri is an aerobic, nonfermentative, Gram-negative rod with polar monotrichous flagella. We report the case of a four-year-old boy who developed community-acquired pneumonia and empyema caused by *P. stutzeri*. To our knowledge, this is the first report on community-acquired pneumonia and empyema caused by this organism in childhood.

Key words: *Pseudomonas stutzeri*, community-acquired pneumonia, childhood.

Pseudomonas stutzeri is an aerobic, non-fermentative, Gram-negative rod with polar monotrichous flagella. *P. stutzeri* is a ubiquitous saprophyte found in soil, water and hospital environments¹. The organism has been isolated rarely from blood, urine, wound, sputum, ear drainage, synovial fluid, hospital equipment and bone following fracture or surgery². We report a case of a four-year-old boy who had community-acquired pneumonia and empyema caused by *P. stutzeri*.

Case Report

A four-year-old boy was admitted to the emergency department of pediatrics with complaints of fever, cough and shortness of breath for 10 days.

On physical examination, his weight was 17.5 kg, temperature 39.2°C (102.6°F), pulse 154 beats/min, respiratory rate 58 breaths/min, and blood pressure 90/60 mmHg. He was alert and cooperative, but appeared ill with mild respiratory distress, intercostals and subcostal retractions and nasal flaring. His lung examination revealed crackles on the right upper and no breath sounds on the right lower lung fields.

Laboratory findings included: hemoglobin, 9.5 g/dl; white blood cells, 17.9x10⁹/L (17.9x10³/μl) with 72% neutrophils and 28%

lymphocytes and platelet count, 760x10⁹/L (760,000/μl). Serum glucose, creatinine, electrolyte, liver enzymes and blood urea nitrogen levels were all normal. The X-ray (Fig. 1), ultrasound and computed tomography of the chest showed pleural effusion on the right side. Thoracentesis was done and revealed empyema.



Fig. 1. Chest X-ray of the patient.

Microscopic examination of the pleural fluid showed polymorphonuclear leukocytes, but no organisms were detected with Gram stain. Pleural fluid protein, lactic dehydrogenase and specific gravity were 4.2 g/dl, 21100 IU/L, and 1030, respectively. Culture of the pleural fluid revealed oxidase-positive and catalase-negative organism. Final identification of the microorganism was *P. stutzeri* by crystal system (Becton Dickinson, USA). *P. stutzeri* was susceptible to piperacillin, cefotaxime, cefepime, amikacin, netilmicin, ciprofloxacin and meropenem by disc diffusion method. After 14 days of cefotaxime and piperacillin therapy, he had completely recovered.

Other laboratory tests showed the following values: IgG, 1136 mg/dl; IgG₁, 1026 mg/dl; IgG₂, 148 mg/dl; IgG₃, 40 mg/dl; IgG₄, 22 mg/dl; IgA, 153 mg/dl; IgM, 139 mg/dl; IgE, 22 U/ml; IgD, 5.5 mg/dl; C₃, 160 mg/dl; C₄, 41 mg/dl; C₁ esterase inhibitor, 461 mg/dl; α_1 antitrypsin, 199 mg/dl and the sweat test, 21 mmol/L in normal range. Nitroblue tetrazolium test was normal. Serological tests for human immunodeficiency virus were negative.

Discussion

Gram-negative bacilli cause 5% of community-acquired pneumonias. It is believed that infection is caused by aspiration of the pathogen from the oropharynx in immune deficiency states^{3,4}. *P. stutzeri* rarely causes infections like septic arthritis, osteomyelitis otitis media, pneumonia, wound and eye infections⁵. Patients with *P. stutzeri* infections often have serious underlying disease⁶.

Examination of the pleural fluid is useful in establishing the etiology. Transudative and exudative pleural effusions can be differentiated by the levels of protein and lactate dehydrogenase (LDH). Although infections elevate LDH levels⁷, in our patient LDH level of the pleural fluid was extremely high, and higher than any pleural fluid LDH level reported in the literature. This may be unique for *P. stutzeri* infections. To date, five cases of

community-acquired pneumonia caused by *P. stutzeri* have been reported. All these cases were adult and there were predisposing factors for pneumonia. In our patient, we could not determine any predisposing factor like liver or lung disease, immune deficiency, malignancy, HIV or cystic fibrosis^{6,8-10}.

To the best of our knowledge, this is the first report of a community-acquired pneumonia and empyema caused by *P. stutzeri* in children.

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