CASE REPORT

Lung abscess complicating pneumococcal pneumonia: a causal role of non-steroidal anti-inflammatory drugs?

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SUMMARY

Pulmonary abscess is a distinctly uncommon complication of pneumococcal pneumonia in immunocompetent adults that has recently been reported to occur following administration of non-steroidal anti-inflammatory drugs (NSAIDs). We report herein the case of a 24-year-old patient with no predisposing risk factor who developed a lung abscess after NSAIDs exposure, further illustrating this potentially severe complication of NSAIDs use, especially in the absence of associated antibiotic therapy.

BACKGROUND

Pulmonary abscess is a distinctly uncommon complication of pneumococcal pneumonia in immunocompetent adults. It has recently been reported that community-acquired pneumonias could be complicated by lung abscess following administration of non-steroidal anti-inflammatory drugs (NSAIDs).¹ However, the presence of other predisposing factors for lung cavitation makes it hard to draw a definite causal relationship between NSAID use and pleuropulmonary complications in the setting of pneumococcal pneumonia. We do believe that the present case of lung cavitation complicating the course of pneumococcal pneumonia in an otherwise healthy young woman emphasises the potential role of NSAIDs use in the development of local lung complications. This case is consistent with and illustrates what has recently emerged on the risks associated with NSAIDs use in patients with community-acquired pneumonia.¹

CASE PRESENTATION

A 24-year-old woman with no previous medical history was hospitalised to our intensive care unit (ICU) for acute respiratory failure.

Five days before admission, she presented with acute fever (39.5°C) and right chest pain, which were efficiently relieved by self-medication with NSAIDs (ibuprofen, 2.4 g per day orally for 3 days). No antibiotic treatment was associated. Two days before ICU referral, fever and chest pain relapsed despite ongoing NSAID therapy. A minor haemoptysis occurred, and she presented to the emergency department of another hospital. NSAIDs were discontinued and a macrolide analogue (pristinamycin) was administered. As her condition deteriorated, she was subsequently referred to our ICU. On admission, her temperature was 38.3°C, pulse oximetry was 92% on room

air, respiratory rate 41/min, heart rate 123/min and blood pressure 119/64 mm Hg. Pulmonary examination revealed decreased vesicular murmur and crackles on the right side together with signs of respiratory distress (*ie*, rapid, shallow breathing) but there was no other organ dysfunction. The pneumonia severity index² was 55.

INVESTIGATIONS

Laboratory tests showed increased white cell count (23×10^9 cells/L) with a predominance of neutrophils (17×10^9 /L) and a high C reactive protein level (340 mg/L). Arterial blood gases on room air were as follows: pH 7.56 partial pressure of oxygen 63 mm Hg, partial pressure of carbon dioxide 29 mm Hg and lactates 1.7 mmol/L. A chest X-ray showed right-sided alveolar infiltrates and a pleural effusion (figure 1A).

The pleural effusion was drained and intravenous cefotaxime and spiramycin were promptly administered.

Sputum Gram stain examination and culture were negative. Urinary pneumococcal antigen and blood cultures were negative.

Pleural fluid examination showed Gram-positive cocci, and a pneumococcal antigen test of the pleural fluid was positive, but cultures remained negative.

The persistence of fever after 5 days of antibiotic therapy and a suggestive chest X-ray after drainage (figure 1B) prompted a chest CT scan, which confirmed a parenchymal cavitation of the right middle lobe (figure 1C). There was no associated pulmonary arterial thrombosis. A flexible bronchoscopy was normal. An HIV test was negative and a serum protein electrophoresis was normal. No extrapulmonary involvement of the pneumococcal infection was evidenced. Specifically, an ear, nose and throat clinical examination, as well as a CT scan of the paranasal sinuses were normal.

TREATMENT

Antibiotic treatment with intravenous cefotaxime followed by oral amoxicillin was continued for a total duration of 6 weeks.

OUTCOME AND FOLLOW-UP

A complete recovery was confirmed at 3 months. A chest CT scan was normal, except for the presence of mild bronchiectasis in the right middle lobe.

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Figure 1 (A) Left-sided panel: chest radiograph showing right-sided alveolar infiltrates and pleural effusion; (B) right-sided panel: chest radiograph after drainage showing a right-sided lung cavitation; (C) coronal chest CT-scan slice showing a cavitation of the right middle lobe, as well as lung effusion and alveolar consolidation of the right lung.

DISCUSSION

Streptococcus pneumoniae is the most common aetiology of community-acquired pneumonia. Pleural empyema may occur in up to 10% of cases but lung abscess is exceptional in adults.^{3–5} In fact, pneumococcal pulmonary abscess has been described

only in children or in the presence of host risk factors, especially immunosuppression, particularly HIV infection.⁶ Our patient, a young and healthy woman, developed both lung empyema and cavitation, while having no known risk factors. We speculate that in the present case, pleuropulmonary complications were precipitated by NSAIDs use. A recent report suggests that NSAIDs use, while alleviating systemic inflammation, may predispose to complicated pneumonia with empyema and cavitation, perhaps by delaying the administration of antibiotics and favouring local thrombosis.⁷ The complicated course of pneumococcal infection in our young patient with no predisposing risk factor is a further exemplary illustration of this potentially severe complication of NSAIDs use, and emphasises their role in the development of local complications, especially in the absence of associated antibiotic therapy.

Learning points

- Pneumococcal pulmonary abscess is an unusual complication, which has been described only in children or in the presence of host risk factors.
- Non-steroidal anti-inflammatory drug (NSAIDs) use, while alleviating systemic inflammation, may predispose to complicated pneumonia with empyema and cavitation.
- NSAIDs exposure could predispose to the development of lung abscess in patients with pneumococcal pneumonia, especially in the absence of associated antibiotic therapy.

Contributors AG and NP collected the data and drafted the manuscript, CBB corrected the manuscript and all authors approved the final version of the manuscript.

Competing interests None.

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