Necrotising pneumonia following influenza due to PVL-negative *Staphylococcus aureus* in a 64-year-old woman

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DESCRIPTION

A 64-year-old immunocompetent woman presented to our institution during the 2016–2017 influenza A(H3N2) epidemic for cough and fever. She presented 10 days ago with an influenza syndrome, treated with ibuprofen 400 mg/day for 7 days. As the fever continued, with blood-streaked sputum, amoxicillin with clavulanic acid was prescribed for 3 days and then ceftriaxone (1 g/day). She had elevated transaminases and C reactive protein (184 mg/L). A chest X-ray was performed, showing a left pneumonia (figure 1A), and the patient was admitted in the infectious disease unit. There was no respiratory failure. Amphoric breath sound was heard at the top of the right lung. Antibiotics were modified, as levofloxacin (500 mg twice daily) was added to cefotaxime (1 g/8 hours). A CT scan of the chest was performed (figure 1B,C), showing a bifocal pneumonia involving the upper right and lower left lobes, and excavated bilateral nodules. The bronchoalveolar lavage showed a positive influenza A PCR and 10^{6.4} UFC/mL methicillin-sensitive *Staphylococcus aureus*. Blood cultures remained sterile. Genes encoding the Panton Valentine leucocidin (PVL) were not detected, whereas genes encoding TSST-1 and enterotoxins A, G, I, M, N, O and U were detected. The clinical status improved after a few days of intravenous oxacillin (8 g/day for 14 days), combined with gentamicin 300 mg/day for 3 days, and then with oral clindamycin 1800 mg/day during 42 days.

The role of PVL is well described in the pathogenesis of *S. aureus* necrotising pneumonia, especially in case of influenza coinfection.¹ Some cases have been reported of clinical isolates producing both PVL and TSST-1, responsible

for fatal *S. aureus* haemorrhagic pneumonia, but the implication of superantigenic toxins (TSST-1 and/or enterotoxins) is uncertain.² α -Haemolysin (Hla) is another virulence factor, usually expressed by all *S. aureus* strains. Hla is a pore-forming toxin that possesses cytolytic properties, and we hypothesised that this toxin could be overproduced and be responsible for PVL-negative *Staphylococcus* necrotising pneumonia. Clindamycin has an antitoxin activity to limit the production of the PVL, but also of Hla. This antibiotic could be also added in case of PVL-negative *S. aureus* necrotising pneumonia.³

Learning points

- ▶ *Staphylococcus aureus* necrotising pneumonia could be due to Panton Valentine leucocidin (PVL)–negative strains.
- ▶ An overexpression of alpha haemolysin might participate in the local necrosis of the lung.
- ▶ Prescribing antibiotics that have an antitoxin activity to limit the production of alpha-toxin could remain an important therapy in case of PVL-negative *S. aureus* necrotising pneumonia.

Contributors SR, TP and TF participated in the patient care. FV isolated the *Staphylococcus aureus* and performed the PVL PCR. SR wrote the first draft of the manuscript. SR, TP, FV and TF improved the manuscript, performed the literature review and approved the final version of the manuscript.

Competing interests None declared.

Patient consent Obtained.

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Figure 1 Chest X-ray (A) and CT scan (B,C) showing multilobar pneumonia with necrosis within the infected parenchyma.

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