Case report

Salmonella empyema an unusual infection – A case report

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A B S T R A C T
Pleuropulmonary Salmonella infections are very rare and are associated with high mortality.

We present a case of empyema to Salmonella in an 83-year-old male patient, with uncontrolled hematological disease. The patient presented with a one-week history of fever, productive cough with purulent sputum, dyspnea, and pleuritic pain localized to the right hemithorax. He denied having nausea, vomiting, and diarrhea. No history of smoking or respiratory diseases.

Chest imaging showed a right loculated pleural effusion with adjacent parenchymal consolidation. Blood test revealed anemia without leukocytosis with elevated C-reactive protein (36.2 mg/dL).

A chest tube was placed, with drainage of purulent fluid and empiric antibiotic therapy with ceftriaxone and clindamycin was started. Pleural fluid and blood cultures were positive for Salmonella serotype Enteritidis. The stool cultures were negative.

Due to slow improvement, clindamycin was suspended and ciprofloxacin was initiated. The patient showed clinical and laboratory improvement. After seven weeks of antibiotic therapy, he presented with negative blood cultures and significant imaging improvement. The patient was discharged.

This case describes a positive outcome in an unusual infection with a high mortality caused by nontyphoid Salmonella.

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Introduction

Salmonella is a pathogenic bacillus of the Enterobacteriaceae family. This enteric agent is responsible for gastrointestinal infections, which are usually self-limiting, as well as extraintestinal infections, such as endocarditis, urinary tract infections, and septic arthritis [1–3].

Pleuropulmonary infections by this Gram-negative bacteria are rare and associated with high mortality, especially in immunocompromised hosts [3–7].

Salmonella may cause very severe infections, with bloodstream invasion and bacteremia. The serotype Salmonella enterica serovar Enteritidis has a high capacity for blood invasiveness capacity. The severity of the clinical presentation is often defined by the agent’s virulence and the host immunity status [1,3,4,6].

Non-typhoid Salmonella infections are usually associated with contaminated foods or contact with reptiles or their habitats [1].

We present a rare and challenging case of extraintestinal infection by Salmonella.

Case report

An 83-year-old male, retired farmworker, with a medical history of myelodysplastic syndrome with excess blasts, necessitating blood transfusion support every 15 days.

The patient came to the emergency department with a one-week history of fever (38.3 °C), productive cough with purulent sputum, dyspnea and pleuritic pain localized to the right hemithorax. He denied having nausea, vomiting, or diarrhea.

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and had no history of smoking or respiratory diseases. He also denied having any recent foreign travel, exposure to undercooked or contaminated food, and contact with reptiles or amphibians.

At the physical examination, the patient was pale and afebrile, with a blood pressure of 110/60 mmHg and pulse of 90 bpm. He was eupneic with oxygen saturation of 96 % on room air. Pulmonary auscultation revealed a decrease in the breath sounds and dullness to percussion over the right base.

The laboratory tests revealed anemia (hemoglobin 6.8 g/dL; hematocrit 19.8 %) no leukocytosis (white blood count 5700 cells/
with empyema in an immunocompromised patient was assumed, and empirical antibiotic therapy was initiated with intravenous ceftriaxone at 1 g twice a day associated with clindamycin at 600 mg four times a day. The patient began respiratory physiotherapy.

On hospital day 5, pleural fluid and blood cultures were positive for *Salmonella enterica* serotype Enteritidis. Antimicrobial susceptibility testing showed sensitivity to cotrimoxazole, ceftriaxone, ciprofloxacin, and ampicillin. Stool cultures were negative. Based on these findings, we assumed a diagnosis of *Salmonella* non-typhoid pneumonia complicated by empyema and bacteremia. Clindamycin was suspended and intravenous ciprofloxacin at 200 mg twice a day was added to ceftriaxone, which resulted in clinical and laboratory improvement.

Two weeks after treatment, new blood cultures were negative for pathogens.

The patient was discharged, after seven weeks of antibiotic therapy, with negative blood cultures and significant imaging improvement (Fig. 4). One year later, the patient had not relapsed.

**Discussion**

*Salmonella enterica* serotype Enteritidis is one of the most common serotypes, and it seems that impaired cell-mediated immunity is an important factor in the pathogenesis of extra-intestinal salmonellosis [1,2,4]. This case emphasizes a complicated and extremely rare case of pleuropulmonary disease due to non-typhoid *Salmonella*. The results show that considering *Salmonella* infections in an immunocompromised patient is very important. In our patient, this condition was found as a risk factor. Pleuropulmonary infections by this microbiological agent have high mortality, but despite an uncontrolled hematological disorder, the patient was a successful case. A conservative approach, without the possibility of surgical intervention can have positive outcomes.

The diagnosis was also made challenging by the lack of gastrointestinal symptoms and no leukocytosis, but the literature does point out that primary bacteremia without gastroenteritis is more common in patients with severe immunosuppression [1,3,4]. In this atypical presentation, a high level of suspicion is crucial for an early diagnosis and prompt treatment, reducing the morbidity and mortality risk. Although non-typhoid *Salmonella* infections are usually associated with contaminated foods, in the present case, the source of the patient's *Salmonella* was not discovered.
Author statement

All persons who meet authorship criteria are listed as authors, and all authors certify they have participated in the work to take public responsibility for the content.

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Patient consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of written consent is available for review by the Editor-in-Chief of this journal.

CRediT authorship contribution statement

André Nunes and Ricardo José Cordeiro analyzed and interpreted patient data. Natália André took care of the patient and was a great contributor in the conception of the work. Carina Maria Rôlo Ferreira Silvestre took care of the patient and wrote the manuscript. João Eusébio, Teresa Falcão and António Carlos Domingos revised the manuscript. Carina Maria Rôlo Ferreira Silvestre, André Nunes, Ricardo José Cordeiro, João Eusébio, Natália André, Teresa Falcão, António Carlos Domingos read and approved the final manuscript.

Declaration of Competing Interest

The authors report no declarations of interest.

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