



## Case report

Occupationally acquired *Pasteurella multocida* pneumonia in a healthy abattoir worker

Shyamala Pradeepan\*, Sandy Tun Min, Katy Lai

Department of Respiratory and Sleep Medicine, Department of Infectious Disease and Immunology, John Hunter Hospital, Division of Medicine and Public Health, University of Newcastle, Australia

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## ABSTRACT

An otherwise healthy male abattoir worker presented to his general practitioner with acute hypoxemia due to bronchopneumonia. His only occupational exposure was cleaning cow carcasses being prepared for consumption. Blood cultures were eventually positive for *Pasteurella multocida*. To our knowledge, this is the first reported case of *Pasteurella multocida* pneumonia in an abattoir worker, and illustrates the importance of considering this infection in patients with animal exposures.

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## 1. Introduction

We report the first ever case of *Pasteurella multocida* bacteraemia and bronchopneumonia in an immune competent, abattoir worker as an occupational zoonosis.

*Pasteurella multocida* is a small, gram-negative coccobacillus, known to be a zoonotic pathogen of human disease. It is commonly found as part of the normal flora of the oral and upper respiratory tract of domestic animals such as cats and dogs, and livestock including poultry, swine and cattle, but can also cause opportunistic infections in the above-mentioned animals [1].

In humans, *Pasteurella multocida* most commonly causes soft tissue infections, often following animal bites or scratches but not necessarily always.

Cases of pneumonia have been reported, more frequently in patients with underlying chronic pulmonary conditions or in immunocompromised state [1].

## 2. Case report

A 29-year-old Abattoir worker initially presented to his general practitioner with 1-week history of lethargy, shortness of breath, and chest and upper abdominal pain. At this clinic visit, his oxygen

saturation was very low (74%) on room air; heart rate 150 beats per minute; and respiratory rate 50 breaths per minute with blood pressure of 140/90 mmHg. Physical examination revealed widespread crackles bilaterally. The patient was immediately transported to the closest district hospital emergency department.

He was an immigrant from Taiwan, who arrived in Australia 18 months prior, on a working holiday. He never smoked, denied any past medical history and was previously well. He worked in an abattoir, where his duty was to clean the gastrointestinal contents of cattle. The workplace provided gloves but the patient denied using masks. No other contact with animals was noted including pets.

In district hospital emergency room, he had fever with temperature of 38.5 °C. Chest X-ray and blood cultures were taken. His condition failed to improve despite treatment and then was transferred urgently to the tertiary care hospital. The patient was intubated on air by retrieval team for worsening respiratory failure.

His initial chest x-ray showed multiple nodular infiltrates bilaterally but worse on the right lung field (Fig. 1). Leukocyte count was  $4.2 \times 10^9/L$  with thrombocytopenia (platelet count  $88 \times 10^9/L$ ). Inflammatory markers were elevated with CRP 295 mg/L and procalcitonin 44ng/mL. He was started on broad-spectrum antibiotics with piperacillin/tazobactam and doxycycline (see Fig. 2).

Blood cultures became positive after 24 hours with gram-negative coccobacillus. The organism was identified as *Pasteurella multocida* after 48 hrs. On the third day and was found to be susceptible to beta-lactams, tetracycline and quinolones. Antibiotic was changed to benzylpenicillin and continued for 14 days

\* Corresponding author. John Hunter Hospital, Look Out Road, New Lambton NSW 2305, Australia.

E-mail address: [Shyamala.pradeepan@hnehealth.nsw.gov.au](mailto:Shyamala.pradeepan@hnehealth.nsw.gov.au) (S. Pradeepan).



**Fig. 1.** Initial chest X-ray at the Regional, showing nodular infiltrates.



**Fig. 2.** CT Chest shows significant peribronchial thickening and bronchiolectasis. It also shows loculated pleural effusion.

intravenously.

He was successfully extubated four days after admission. Subsequently he developed an exudative pleural effusion which was loculated. This was drained by Intercostal catheter, and the patient was discharged home after 15 days of hospital stay on oral amoxicillin for 2 more weeks.

At six weeks review he was found to be in good health with no respiratory symptoms and His lungs were clinically found to be normal. The CXR showed normal lungs.

### 3. Discussion

The *Pasteurella* genus is part of the Pasteurellaceae family, which comprises of a large group of Gram-negative bacteria [1]. *Pasteurella multocida* is a small, non-motile, non-spore forming, and facultative anaerobic coccobacillus, which is the most frequent causative organism in human Pasteurellosis. It is found commonly in oral and upper respiratory tract secretions of even healthy animals: 70% in cats and 54% in dogs. In our patient, dead cattle are most likely the source of infection although Hotchkiss et al. found the carrier rate of *P. multocida* in cattle to be as low as 17% [2].

Clinical infections with *Pasteurella* are often the results of bites or scratches from animals especially cats and dogs, animal licks on wounds or skin abrasions, or other contact with animals [1]. Although exposure to animals is often established, In about 16%–31% have no known animal contact contributing to their infection [3]. Suspected mode of transmission in this case was inhalation of aerosolized secretions contaminated with *Pasteurella multocida* from cattle, which resulted in colonization of tracheobronchial tree and ultimately invasive infection.

The respiratory tract was the second most commonly affected site by *Pasteurella multocida*, after soft tissue infections. Interestingly, it is also occasionally seen as a colonizer in healthy patients. It has also been noted that the affected patients tend to have predisposing underlying chronic lung diseases such as bronchitis, bronchiectasis, chronic obstructive pulmonary disease, and lung malignancy.

It is unusual for a young, healthy patient with no underlying lung disease to develop severe infection such as in our case. This prompted further investigation of his immune status, which showed no evidence of HIV infection or immunoglobulin deficiency.

It is almost certain that this was an occupationally acquired infection in our patient. However, *Pasteurella multocida* has very rarely been recognized as an occupational zoonosis. We found two cases: Umemori et al. reported a case of lung abscess in a researcher who had worked on a farm for many years [4], and a pregnant veterinary surgeon who developed puerperal sepsis [5]. To our knowledge, there has not been a case of *Pasteurella* infection in abattoir workers who are at risk of occupational zoonosis due to the close contact with animals.

In conclusion, *Pasteurella multocida* can cause serious, life-threatening infection even in otherwise healthy patients. We need to have a high index of suspicion and start including it in the differential diagnoses of sick patients with increased animal contact.

### Statement confirming consent

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

### Conflict of interest statement

A conflict of interest exists when professional judgement concerning a primary interest (such as patients' welfare or the validity of research) may be influenced by a secondary interest (such as financial gain or personal rivalry). Please declare any actual or potential conflict of interest, and give details, or the absence of any conflict of interest.

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### Author's statement

"I declare on behalf of my co-authors and myself that we do not have any conflict of interest to declare".

### Authorship declaration

The corresponding author must complete and sign this section upon submission on behalf of all the co-authors.

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