



A CASE OF PANTOEAE PNEUMONIA IN AN IMMUNOCOMPETENT HOST: A POST-LOBECTOMY CASE OF THE TYPICAL CARCINOID TUMOUR

Medicine

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ABSTRACT

The *Pantoea* is a Gram-negative bacteria of the family *Enterobacteriaceae*, causing opportunistic infection in immunocompromised hosts. The *Pantoea* organism is usually a plant pathogen, but human infection in the immunocompromised host is not uncommon. We have one immunocompetent adult who underwent right lower lobectomy for a typical carcinoid tumour of the bronchus, encountered with *Pantoea* infection and pneumonia on the same side. The patient was successfully treated with sensitive antibiotics.

KEYWORDS

Pantoea infection, Pneumonia, Carcinoid tumour, Immunocompetent host, Plant pathogen, Lobectomy

INTRODUCTION

Pantoea, a gram-negative aerobe from *Enterobacteriaceae* family, is primarily an environmental and agricultural organism that inhabits plants, soil and water. The *Pantoea* organism has been reported as both commensal and pathogen of animals and humans.^[1] The organism can cause opportunistic human infections, mostly in post-surgical wounds, trauma by plant material, or as a hospital-acquired infection, mostly in the immunocompromised individuals. *Pantoea* infection in immunocompetent adult, without any surgical wound or vegetative material trauma, is rare. We reported a case who presented with acute onset of cough with blood-tinged sputum, dyspnea and fever for a few days. On evaluation and investigations, he found to have right lower zone consolidation and minimal pleural effusion, and his sputum culture grew pan sensitive *Pantoea* organism.

Case report

A 51 years American male, past light smoker and an asthmatic, was presented with complaints of cough with blood-tinged sputum, dyspnea and fever for 2 days. He also has recurrent wheezing, and his regular medication is fluticasone propionate and formoterol fumarate dihydrate (250/10mcg) aerosol Inhaler.

On examination, he was febrile; oxygen saturation was 96% on room air, and chest auscultation revealed right basal crackles. He has a personal history of typical carcinoid tumour of right lower lobe bronchus, and he underwent right lower lobectomy two years before his current visit. His postoperative period was uneventful so far, and his surgical wound is completely healed up. His recent blood result of chromogranin A (23.6 ng/ml) and serotonin (93.0ng/ml) level was normal. He does not have any recent history of hospitalization and trauma.

On investigations, his blood test revealed C-Reactive Protein (CRP) 87.94 mg/l, hemoglobin 16.0 gm/dl, WBC $6.85 \times 10^3/\text{mCL}$, platelet count $173 \times 10^3/\text{mCL}$ and normal BUN. His chest x-ray (Fig. 1) showed basal segmental atelectasis/consolidation in the right lower zone, with a possible mild right pleural effusion. Patient's sputum culture on blood agar media grew *Pantoea* species



Fig.1: Chest x-ray showing basal segmental consolidation in the right lower zone, with a possible mild right pleural effusion.



Fig. 2: Blood agar media showing growth of *Pantoea* species



Figure 3: Follow up chest x-ray showing significant resolution of the right lung shadow

(Fig. 2) sensitive to beta-lactams, carbapenems and quinolones. He was started on sensitive antibiotics (Cefuroxime and Levofloxacin), and he showed a favorable clinical response and his repeat chest x-ray (Fig. 3) showed significant resolution of the right lung shadow.

DISCUSSION

Pantoea organism is a gram-negative environmental and agricultural organism that is inhabited in plants, soil, water, and food.^[2] The *Pantoea* organism has around 20 species with *P. agglomerans*, previously known as *Enterobacter agglomerans* or *Erwinia herbicola* is the most common species found in humans.^[3]

The *Pantoea* organism is an opportunistic pathogen of the immunocompromised host.^[4] The human infection is caused by penetrating trauma with vegetative material during agricultural work, gardening or children playing, and also with secondary bacteremia, or nosocomial infections that are related to medical equipment such as intravenous catheters or contaminated intravenous fluids.^[5-7] *Pantoea* infection is also associated with contaminated intravenous fluid, total parenteral nutrition, propofol, blood products, and powdered infant formula.^[6,8] Our case is an immunocompetent host, without any history of trauma with vegetative material. Still, he had lobectomy two years back for a typical carcinoid tumour of the right lower lobe bronchus and lung, and he is on inhaled corticosteroid for a long time.

Cheng et al. and Shubov et al. have also reported two cases of *Pantoea agglomerans* pneumonia in the underlying condition of bladder cancer and heart-lung transplant.^[2,9] There are various thoughts regarding the transmission of this organism in the human body, includes gastrointestinal translocation through mucosal lesions in the gastrointestinal tract and or low stomach acidity after the ingestion of plant products,^[2] normal hand flora, and the household environment may be a source for both community- and hospital-acquired infections,^[10] occupational exposure to organic dust^[11] and directly penetrating human skin through microtrauma sites and or medical devices. The blood group A is more likely associated with *P. agglomerans* bacteremia, likely due to its well-known association with certain gastrointestinal disorders.^[2]

Pantoea infection of certain body organs leads to septic arthritis, osteomyelitis, or synovitis^[12] endocarditis^[13], endophthalmitis^[14], and wound superinfection and a chronic inflammatory response if penetrates deeper into the skin.

Clinical presentation of *Pantoea* infection depends on site of infection and involved organs, and includes fever, bacteremia, raised inflammatory markers, anaemia, thrombocytopenia, gastrointestinal symptoms, disseminated intravascular coagulation, hypotension, and shock.^[15] Our case was presented with typical symptoms of pneumonia as the involved organ was lung.

The diagnosis of *Pantoea* infection can be made by a positive gram's stain or culture of the specimen from the infected site in constellation with an appropriate clinical picture. Most of the patients usually give a good response to appropriate antibiotics, and they have a favourable outcome, except in pediatric or neonatal population where severe disease and the worse outcome was reported in certain cases.^[16,17] In some rare scenarios, *Pantoea* infection can cause severe disease leading to septicemia, disseminated intravascular coagulation and multiorgan failure.^[18] Our case was responded well with a short course of outpatient antibiotics (1 week), and he was explained about the potential risk factors like lobectomy and bronchial stump and inhaled corticosteroid in his case.

CONCLUSION

The *Pantoea* is a less virulent organism commonly infect the immune challenge individuals, and rarely causes disease in immunocompetent adults. Our case is an immunocompetent patient, but he has an underlying sutured stump of bronchus and history of inhaled corticosteroid. The structurally abnormal airways or inhaled steroid can be considered a potential risk factor for *Pantoea* infection or colonization in the human.

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