**CASE REPORT**

**Delftia acidovorans: A rare pathogen in immunocompetent and immunocompromised patients**

Huseyin Bilgin MD1, Abdurrahman Sarmis MD2, Elif Tigen MD1, Guner Soyletit MD2, Lutfiye Mulazimoglu MD1

**CASE PRESENTATION**

A 68-year-old woman with an unremarkable medical history who had been diagnosed with B cell acute lymphocytic leukemia was admitted to the hematology clinic to undergo chemotherapy. Three days before admission, she developed cough, purulent sputum and dyspnea without fever. She had not been admitted to the hospital or have a history of antibiotic use within the previous three months.

On examination, her body temperature was 36°C, with a blood pressure of 105/50 mmHg, a heart rate of 80 beats/min, a respiratory rate of 30 breaths/min and oxygen saturation of 88% on room air. Breath sounds were coarse, with bilateral rales. Her physical examination was otherwise unremarkable. A computed tomography scan of her lungs revealed areas of consolidation suggesting pneumonia. On admission, she was started on intravenous piperacillin-tazobactam, 4.5 g every 6 h, ciprofloxacin, 400 mg every 12 h, as well as vincristine and prednisolone. Blood, urine and sputum cultures were negative.

On day 6, she became neutropenic. Hypoxemia, cough and sputum improved on day 14. Elevated C-reactive protein and procalcitonin levels decreased substantially. Antibiotics were discontinued. Meanwhile, treatment with imatinib was initiated.

On day 17, her initial symptoms recurred and a computed tomography scan revealed progression of previous consolidation areas. Serial serum galactomannan antigen tests were negative. Sputum cultures were obtained and piperacillin-tazobactam and ciprofloxacin were started again. Blood cultures were not repeated because the patient was afebrile.

Le **Delftia acidovorans**: un agent pathogène rare chez les patients immunocompétents et immunodéprimés

Le **Delftia acidovorans** est un bacille aérobie à Gram négatif sans pouvoir de fermentation. C'est un organisme généralement non pathogène présent dans l'environnement, qui est rarement significatif sur le plan clinique. Même si l'infection à **D acidovorans** s'observe surtout chez des patients hospitalisés ou immunodéprimés, plusieurs rapports le signalent chez des patients immunocompétents. Le présent article décrit un patient atteint d'une leucémie lymphoïde de type B compliquée par une pneumonie à **D acidovorans** éradiquée par antibiothérapie. D'après le présent rapport, des agents pathogènes inhabituels peuvent être cliniquement significatifs à la fois chez les patients immunodéprimés et chez les patients immunocompétents. Puisque le **D acidovorans** résiste souvent aux aminosides, il est important de le déceler rapidement.

**DISCUSSION**

**D acidovorans**, formerly known as *Comamonas acidovorans* or *Pseudomonas acidovorans*, is found in soil, water and the hospital environment. It can be isolated from the respiratory tract, the eyes and blood; however, it is rarely clinically significant (1).

We reported a **D acidovorans**-associated pneumonia in a neutropenic patient. One case involving pneumonia and bacteremia has been reported in the Turkish-language literature (2). Three cases involving pulmonary infections with **D acidovorans** have been reported in the English-language literature (3-5). Bacteremia associated with intravascular catheters (6-11) and endocarditis (12,13) have been reported. Peritonitis (14), ocular infections (15-17) and urinary tract infection (18) have also been reported in the literature.

**Key Words**: Delftia acidovorans; Fehrle neutropenia; Immunocompromised; Pneumonia

**Pseudomonas acidovorans**

**Comamonas acidovorans**

**Delftia acidovorans**

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1. Marmara University School of Medicine, Infectious Diseases and Clinical Microbiology, 2Marmara University School of Medicine, Department of Microbiology, Istanbul, Turkey

Correspondence: Dr Huseyin Bilgin, Marmara Universitesi, Pendik Egitim ve Arastirma Hastanesi, Enfeksiyon Hastalıkları Anabilim Dalı, Fevzi Çakmak Mah. Mimar Sinan Cad. No: 41 Ust Kaynarca Pendik 34896, Istanbul, Turkey.

Telephone 90 216 625 4693, fax 90 216 625 4790 e-mail husambilginer@gmail.com, huseyin.bilgin@marmara.edu.tr

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TABLE 1

Summary of *Delftia acidovorans* infections according to infection site

| Reference | Age, years | Infection | Risk factor(s) | Treatment | Outcome successful |
|-----------|------------|-----------|----------------|-----------|--------------------|
| Present case | 68 | Nosocomial pneumonia | Hematological malignancy | IV piperacillin/tazobactam | Yes |
| 2 | 79 | Nosocomial pneumonia and bacteremia | Chronic obstructive pulmonary disease | IV meropenem | No |
| 3 | Unknown | Nosocomial pneumonia | AIDS | IV ceftazidime | Yes |
| 4 | 4 | Empyema | Immunocompetent | IV cefepazone/sublactam | No |
| 5 | 5 | Empyema | Immunocompetent | IV imipenem | Yes |
| 6 | 11 | CRBSI | Solid organ malignancy | Catheter removal and IV ceftazidime | Yes |
| 7 | Unknown | CRBSI | Hematologic malignancy | Unknown | Unknown |
| 8 | 4 | CRBSI | Solid organ malignancy | IV ceftazidime | Yes |
| 9 | 27 | CRBSI | AIDS | Catheter removal, IV imipenem and amikacin | Yes |
| 10 | 65 | CRBSI | Hematologic malignancy | Catheter removal and IV imipenem | Yes |
| 11 | 10 | CRBSI | End-stage renal disease and hemodialysis | Catheter removal and IV cefepime | Yes |
| 12 | 42 | Infective endocarditis | Intravenous drug use | IV ceftazidime and ciprofloxacin | No |
| 13 | 30 | Infective endocarditis | Intravenous drug use | IV piperacillin/tazobactam | Yes |
| 14 | 35 | Peritonitis | End-stage renal disease and peritoneal dialysis | IV ceftazidime, oral ciprofloxacin and catheter removal | Yes |
| 15 | 63 | Keratitis | Corticosteroid treatment and corneal transplantation | Topical and IV ceftazidime | Yes |
| 16 | Unknown | Ocular infections | Unknown | Unknown | Unknown |
| 17 | 40 | Keratitis | Hydrogel contact lenses | IV gentamicin and ciprofloxacin | Yes |
| 18 | 61 | Urinary tract infection | Immunocompetent | Oral norfloxacin | Yes |
| 19 | 46 | Bacteremia | Immunocompetent | IV piperacillin/tazobactam | Yes |
| 22 | Unknown | Bacteremia | Pressure-monitoring device | Unknown | Unknown |
| 23 | 93 | Bacteremia | Immunocompetent | IV imipenem/cilastatin | Yes |
| 24 | 30 | Bacteremia | Immunocompetent | IV piperacillin/tazobactam | Yes |

CRBSI: Catheter-related bacteremia; IV: Intravenous

Three cases involving nosocomial pulmonary infections have been reported in the literature. Franzetti et al (3) reported an episode of nosocomial pneumonia as an opportunistic infection in a patient with AIDS. The organism was isolated from bronchoalveolar lavage fluid and the patient responded to cefazidime treatment. Khan et al (4) reported a case involving a four-year-old immunocompetent child with empyema. *D. acidovorans* was isolated from the drainage tube and the endotracheal aspirate sample. The patient did not survive, despite cefepazone-sublactam treatment. Chun et al (5) reported a chronic empyema case associated with *D. acidovorans* in an immunocompetent adult patient.

Although rare, *D. acidovorans* infection can be clinically important in immunocompromised patients with underlying malignancies, such as chronic kidney disease, HIV/AIDS (2) or patients taking immunosuppressive drugs. However, serious infections with *D. acidovorans* have also been reported in immunocompetent patients (4,5,18,19,20).

The susceptibility profile of our isolate was similar to strains in previous reports (10-13).

Identification of the microorganism can be performed using a simple orange indole reaction test. With the addition of Kovac’s reagent, the organism produces anthranilic acid using tryptophan. This results in a pumpkin-orange colour in the media, which is characteristic for *D. acidovorans* (4).

An extensive literature search revealed several other cases of *D. acidovorans* infection (Table 1). Because of the ubiquitous presence of this microorganism, establishing its pathogenicity may be difficult. In the present case, clinical and radiological signs led us to a diagnosis of pneumonia, and the patient improved with antibiotic therapy. At that time, there was a large outbreak with carbapenem-resistant Enterobacteriaceae in the medical and surgical intensive care units. We performed surveillance cultures in the hematology unit, and in the medical and surgical intensive care units. We did not isolate this microorganism from any environmental or patient cultures. Therefore, we accepted the organism as a pathogen in the present case.

A recent study performed in an intensive care unit in Brazil (21) showed clonal dissemination of *D. acidovorans* in hospital settings using molecular confirmation. They isolated 24 *D. acidovorans* strains in 21 patients from deep tracheal aspirate samples. However, they could not decide on the clinical significance of the pathogen due to lack of clinical data and patient follow-up.

*D. acidovorans*-related infections are rare. It can occur in different age groups, as well as in both immunocompromised and immunocompetent patients (3-14). *D. acidovorans* is often resistant to aminoglycosides (20), which are commonly used as empirical treatments in febrile neutropenic patients and in most Gram-negative infections. Therefore, timely identification of this organism to the species level is necessary to determine the most appropriate antibiotic therapy.

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Can J Infect Dis Med Microbiol Vol 26 No 5 September/October 2015
Pneumonia caused by *Delftia acidovorans*

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