EJCRIM
European Journal
of Case Reports
in Internal Medicine

PSEUDOMONAS MENDOCINA BACTERAEMIA SECONDARY TO CELLULITIS – A REPORT AND BRIEF SERIES OF CASES

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Received: 11/12/2024
Accepted: 16/12/2024
Published: 20/01/2025

Conflicts of Interests: The Authors declare that there are no competing interests.
Patient Consent: Signed consent has been obtained from the patient's family.
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How to cite this article: Reis J, Carmo F, Soares I, Salvado C, Fidalgo M. Pseudomonas mendocina bacteraemia secondary to cellulitis – a report and brief series of cases. *EJCRIM* 2025;**12**:doi:10.12890/2025_005094

ABSTRACT

Background: Pseudomonas mendocina is a rare cause of disease in humans with few cases described, but known to cause severe infections, mainly endocarditis and bacteraemia.

Case description: An 86-year-old Caucasian male, with several vascular risk factors (type 2 diabetes, hypertension, dyslipidaemia, coronary heart disease and heart failure), who presented long-standing lower limb phlyctens for which he was being treated, developed lower limb cellulitis. When observed in the Emergency Department, he was septic and was admitted for treatment and surveillance. Blood cultures were positive for *P. mendocina*. He was treated with antibiotics and recovered, and was discharged home.

Conclusion: Damage to the skin barrier as in cellulitis provides a point of entry for *P. mendocina*, a microorganism that lives in soil and water. The source of contamination is rarely identified, but immunocompromised people present a higher risk of infection and severe disease. The antibiotic susceptibility profile is different from the more common *Pseudomonas aeruginosa*, with fewer known resistances. Albeit rare, this is thought to be an underreported infection that clinicians should be aware of.

KEYWORDS

Pseudomonas mendocina, *Pseudomonas*, cellulitis, sepsis, bacteraemia

LEARNING POINTS

- Infection by *Pseudomonas mendocina* is rare but potentially life-threatening.
- Its true prevalence is unknown due to underreporting.
- Immunocompromised patients seem more at risk for infection by this pathogen.

INTRODUCTION

Cellulitis and other soft tissue infections are frequent among middle-aged adults and made more common by risk factors such as obesity, oedema and venous insufficiency[1]. Skin breaks play an important role in the development of this condition, with ensuing pathogen access to the dermis. Clinical presentation includes local signs of inflammation (most often unilaterally on a lower limb) and fever, but

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the latter is not always present, with a reported incidence of 23–77%[1]. Most cases are caused by beta-haemolytic streptococci, followed by *Staphylococcus aureus* in order of frequency; only a minority of cases are caused by Gram-negative aerobic bacilli[1,2]. Pathogen identification from cultures (blood, pus or exudate) is infrequent and most patients are treated empirically, with antibiotic choice based on personal risk factors and local susceptibility profiles. Possible complications of cellulitis include abscess, bacteraemia, endocarditis, osteomyelitis and toxic shock[1].

CASE DESCRIPTION

An 86-year-old Caucasian male presented to the Emergency Department with new onset of fever and loss of appetite. His past medical history was relevant for chronic obstructive pulmonary disease (GOLD grade 3E), coronary artery disease, congestive heart failure (class II NYHA), atrial fibrillation, previous lower limb venous thromboembolism and abdominal aortic aneurism. He also had several modifiable cardiovascular risk factors: obesity, type 2 diabetes, hypertension and dyslipidaemia, and chronic phlyctens in his lower limbs, for which he was being treated with dressing care. His current medication was bisoprolol, ramipril, metformin, atorvastatin, furosemide, spironolactone, indacaterol, glycopyrronium, budesonide and warfarin. He lived in a rural environment but denied drinking water from a well or any known contact with stagnated water. He had no close contact with soil or farm animals.

On physical examination, he was alert but confused. He was febrile (38.8°C) and mildly dehydrated, with a blood pressure of 143/90 mmHg and a heart rate of 82 bpm. Heart sounds were normal, and lung auscultation revealed bilateral fine crackles, with no other obvious changes. His right lower limb was painful, red and warm, with an ulcer in the anterior compartment of the leg with active signs of inflammation.

His laboratory results showed a discrete rise in serum lactate (2.0 mmol/l) and a white blood cell count of 9,980/µl, with neutrophil predominance (9,540/ µl); C-reactive protein was elevated (32.71 mg/dl), as was creatinine and urea (1.36 mg/dl and 109 mg/dl respectively), demonstrating acute kidney injury. Muscle enzymes were also slightly elevated, with CK 78U/l and a myoglobin of 113 ng/ml. Blood samples were sent for microbiology. The patient was admitted for soft tissue infection with sepsis and started on empiric antibiotics with ceftriaxone plus clindamycin.

On day three, both sets of blood cultures were positive for *Pseudomonas mendocina*. The agent was sensitive to ceftazidime, ciprofloxacin, gentamicin and piperacillin/tazobactam *(Table 1)*.

On day six of therapy the patient developed a hypersensitivity reaction to ceftriaxone and was switched to ciprofloxacin. On day eight, antibiotic therapy was escalated to imipenem due to a nosocomial respiratory infection. Local lower limb complications were excluded by CT scan and a transthoracic echocardiogram was performed, which did not show any signs of endocarditis. The patient completed 14 days of parenteral effective antibiotic. At discharge, local signs of inflammation in the lower limb had resolved and a new set of blood cultures came out negative.

Cases reported at our tertiary hospital

Infection by *P. mendocina* is rare but also underreported. In our hospital in the last ten years, there have been three other patients in whom *P. mendocina* was isolated. All isolates had the same sensitivity profile, presented in *Table 1*.

The first case is a 43-year-old woman with a past medical history of atypical lung carcinoma stage 1. The tumour had been excised 10 years previously and the patient was under monitoring, with no treatment and no sign of recurrence. *P. mendocina* was isolated in a bronchoalveolar lavage sample. The patient presented no symptoms or clinical signs of respiratory infection, so the microorganism was considered a colonising agent and therefore not treated.

The second case was of a 72-year-old male with a history of chronic obstructive pulmonary disease, heart failure, atrial fibrillation and chronic lower limb oedema. He was under best supportive care for stage 4 lung adenocarcinoma, but had previously been treated with radiation, from which he developed radiation pneumonitis. He was medicated with prednisolone, valsartan, furosemide, simvastatin and apixaban. The patient presented to the Emergency Department with shortness of breath and fever; on further examination his right leg was red, warm to the touch and had exudative lesions. His blood work showed a rise in inflammatory parameters (white blood count of 15970/ µl, C-reactive protein 6.13 mg/dl), and blood samples revealed

Antibiotic	MIC	Sensitivity
Ceftazidime (mg/dl)	2	sensible
Ciprofloxacin (mg/dl)	0.12	sensible
Gentamicin (mg/dl)	≤1	sensible
Piperacillin/tazobactam (mg/dl)	≤4	sensible
Aztreonam (mg/dl)	16	intermediate sensitivity

Abbreviation: MIC, minimum inhibitory concentration.

Table 1. Antibiotic susceptibility profile for P. mendocina (EUCAST 2019).

the presence of *P. mendocina*. The patient underwent treatment with levofloxacin for eight days and made a full recovery.

The third case was of a 44-year-old woman with a history of type 2 diabetes, medicated with glibenclamide/glyburide. She had recently travelled from Angola where, one month prior, she had had a traumatic injury to the right leg that evolved into an ulcerated lesion. A skin biopsy culture isolated three microorganisms – *Enterobacter cloacae*, *S. aureus* and *P. mendocina*. She was started on ciprofloxacin, with clinical improvement; however, due to the extension of the lesion, the patient required a skin graft for full recovery.

DISCUSSION

Pseudomonas mendocina is a Gram-negative, rod-shaped aerobic bacterium, commonly found in water and soil. It is a rare cause of disease in humans, with fewer than 20 cases described in the literature[3], but known to cause severe infections. The exact incidence of *P. mendocina* infection is unknown[4], but is probably underreported. The most common sites of infection are skin and soft tissue, heart valves and the central nervous system, and the most common presenting symptom is fever. Sepsis occurred in 50% of the described cases, with nearly two-thirds associated with native valve infective endocarditis[5]. Most reported cases failed to identify the source of infection. Due to its rarity, there are no recognised risk factors, although contact with contaminated water or soil is an accepted one. An immunocompromised state probably increases susceptibility, as with other infections. The patient in this case had no known contacts with contaminated sources but was diabetic and therefore immunocompromised and had chronic lesions on his lower limbs, providing a possible point of entry. The same is true for two of the other briefly reported cases (one had active cancer and was under prednisolone, the other was a diabetic). Unlike the more common *P. aeruginosa*, *P. mendocina* is usually susceptible to most antibiotics and mortality rates are low[3]. A few cases of resistance to ampicillin and ampicillin-sulbactam have been described, as well as to trimethoprim-sulfamethoxazole[5], and ceftriaxone and aztreonam (as was the case with our specimen - see *Table 1*). Despite this, third-generation cephalosporins are considered an adequate initial therapy[4].

Pseudomonas mendocina is a rare but potentially serious cause of disease in humans. Even though it is usually less resistant to antibiotics than *P. aeruginosa*, there have been reports of resistance to different groups. Treatment choices should therefore be discussed with the Microbiology team, to guarantee the most adequate regimen and avoid early and late complications.

REFERENCES

1. Raff AB, Kroshinsky D. Cellulitis: a review. *JAMA* 2016;**316**:325–337.
2. Carratalà J, Rosón B, Fernández-Sabé N, Shaw E, del Rio O, Gudiol F. Factors associated with complications and mortality in adult patients hospitalized for infectious cellulitis. *Eur J Clin Microbiol Infec Dis* 2003;**22**:151–157.
3. Ioannou P, Vougiouklakis G. A systematic review of human infections by Pseudomonas mendocina. *Trop Med Infect Dis* 2020;**5**:71.
4. Nseir W, Taha H, Abid A, Khateeb J. Pseudomonas mendocina sepsis in a healthy man. *Isr Med Assoc J* 2011;**13**:375-376.
5. Rapsinski G, Makadia J, Bhanot, N, Min Z. Pseudomonas mendocina native valve infective endocarditis: a case report. *J Med Case Rep* 2016;**10**:275.