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Infection by multidrug-resistant *Elizabethkingia meningoseptica*: case reports

Infecção por Elizabethkingia meningoseptica *multirresistente: relato de casos*

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ABSTRACT

We report two cases of sepsis in critically ill patients in two tertiary care hospitals in Recife-PE, Brazil. The first case is an 87-year-old patient with chronic myeloid leukemia and sepsis; and the second case is a 93-year-old patient with prostate cancer and septic shock caused by multidrug-resistant (MDR) *Elizabethkingia meningoseptica*.

Key words: *Elizabethkingia meningoseptica*; sepsis; myeloid leukemia; cancer.

INTRODUCTION

Elizabethkingia meningoseptica (previously described as *Chryseobacterium meningosepticum* and *Flavobacterium meningosepticum*) is a Gram negative nonfermenting bacteria widely distributed in nature, but rare in humans, in which it is considered an opportunist pathogen[2]. In hospital environment, it occurs on moist surfaces and water, and colonization in patients was also demonstrated by means of contaminated medical equipment[10, 11]. Premature infants and immunocompromised adults are susceptible to infection by this micro-organism which is sometimes responsible for sepsis and meningitis in newborns in hospital nurseries[8]. In adults, it can cause infections in immunocompromised persons or in debilitating conditions, such as cancer, tuberculosis, neutropenia, aplastic anemia, diabetes, organ transplant, endocarditis, pneumonia, postoperative bacteremia, and meningitis[7]. It usually appears as a pathogen resistant to antimicrobials commonly prescribed for the treatment of gram-negative bacteria, including broad-spectrum beta-lactam and aminoglycosides, and, therefore, is a clinical concern[6].

CASE 1

Male, 87-year-old, presenting chronic myeloid leukemia for seven years, was admitted to intensive care unit (ICU) due to exacerbation of chronic pyelonephritis and cardiac arrhythmia. He started receiving renal replacement therapy. Urine culture was collected at admission, and *Enterobacter aerogenes* isolated when treated with amikacin and meropenem combination. There was partial improvement and subsequent worsening of clinical symptoms due to bilateral pleural effusion and pneumonia, in conjunction with respiratory failure, and he started receiving mechanical ventilation. Urine cultures results were positive for multidrug-resistant *Pseudomonas aeruginosa* and samples were collected for blood culture in aerobic and anaerobic bottles. *E. meningoseptica* was identified and the patient was treated with polymyxin B for ten days and ciprofloxacin for 30 days and there was a favorable outcome, which led to his discharge from hospital.

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CASE 2

Male, 93-year-old was admitted to hospital for cancer care, complaining of dyspnea, fever and drowsiness were measured. He had a recent diagnosis of prostate cancer and was receiving treatment for community-acquired pneumonia by ceftriaxone and azithromycin combination. His renal function was not adequate at the time of his admission, but with a preserved urine volume. The ultrasonography of the urinary tract was normal. On the second day of hospitalization, he presented hemodynamic instability volume non-responsive, and then was admitted to the ICU, where blood and urine were collected for microbiological examination. Septic shock was managed with a vasopressor, corticosteroid, and mechanical ventilation. After a short period of stabilization, he presented fever and leukocytes increase. Samples were collected for blood culture in aerobic and anaerobic bottles and the antimicrobial regimen was changed to piperacillin/tazobactam, then *E. meningoseptica* was identified. Renal replacement therapy was begun due to oliguria. Sixteen days after admission, his hemodynamics worsened after an ultrafiltration and dialysis session that was when the patient died.

The bacteriological diagnosis of *E. meningoseptica* in both clinical cases was carried out on automated system for identification: BacT/Alert™ 3D instrument from BioMérieux, after the positive aerobic bottles. Subsequently, these samples were seeded on blood agar and MacConkey Agar, and placed in an incubator at 37ºC for 24 hours. On the blood agar, yellowish colonies with grey hue grew around the colonies, and on the MacConkey Agar there was little growth. *E. meningoseptica* was identified in BioMérieux VITEK 2 instrument. An antibiogram conducted. Data on susceptibility profile are described in **Table**.

TABLE – Antimicrobial susceptibility profile of *E. meningoseptica* isolated from two cases

	Case 1	Case 2
Antimicrobial agent	Interpretation	Interpretation
Piperacillin/Tazobactam	Resistant	Susceptible
Cefoxitin	Susceptible	Susceptible
Ceftazidime	Resistant	Resistant
Cefepime	Resistant	Resistant
Aztreonam	Resistant	Resistant
Imipenem	Resistant	Resistant
Meropenem	Resistant	Resistant
Amikacin	Resistant	Resistant
Gentamicin	Resistant	Not tested
Ciprofloxacin	Susceptible	Not tested
Tigecycline	Intermediate	Susceptible

DISCUSSION

There are some reports of cases of infections by *E. meningoseptica* in patients with hematologic malignancies[2, 4]. Krebs *et al*.[6] reported a case of a 27-year-old patient presenting bacteremia and meningitis by *F. meningosepticum*, and with a history of acute myeloid leukemia, the patient was treated with rifampin, ciprofloxacin, and piperacillin for 23 days. On the other hand, Echeverri *et al*.[2] reported a case of bacteremia in an immunocompromised patient with history of acute lymphoblastic leukemia, initially treated with moxifloxacin, then combined with vancomycin and sulfametaxazol. Both cases were successfully treated and cured.

The literature describes several clinical cases of adult patients infected by *E. meningoseptica*. The patients showed several comorbidities or were submitted to surgery. Clinical symptoms were related to sepsis, meningitis, pneumonia, soft tissues infections, but there is no description of patients with prostate cancer. However, there is a case description of a male patient with paranasal carcinoma treated with radiotherapy who developed meningitis by this pathogen[3].

C. meningosepticum has been related to several clinical syndromes, such as meningitis[7] in a 17-year-old male with history of thalassemia. Dias *et al*.[1] reported a case of a 37-year-old patient with diabetic nephropathy in hemodialysis who developed bacteremia by *C. meningosepticum*. This was the first case reported in a dialysis patient from India. This corroborated with our clinical case, since the patient, besides his history of chronic myelogenous leukemia, presented chronic renal failure and undertook hemodialysis.

Regarding the description of clinical cases of *E. meningoseptica* in Brazil, data from SENTRY Antimicrobial Surveillance Program Report (1997-2001) describe three isolates of *E. meningoseptica* from patients between 66-90 years old, admitted to ICU in a tertiary care teaching hospital in São Paulo[5], which were sensitive to ciprofloxacin and piperacillin/tazobactam, similarly to our study. Also in São Paulo-Brazil, Pereira *et al*.[9] described clinical and epidemiological study of nine patients, two with neutropenia, admitted to two tertiary care teaching hospitals for two years, the deaths occurred in 33% of them, predominantly with pneumonia, the treatment regimen for *E. meningoseptica* was vancomycin.

Although some studies, such as those carried out by Echeverri *et al*.[2], Krebs *et al*.[6], and Pereira *et al*.[9] demonstrated that the antimicrobial trimethoprim-sulfamethoxazole, rifampin, and vancomycin are useful in clinical practice for treating *E. meningoseptica* infections, they were not tested in this study because

they are not part of the standard antibiotics susceptibility cards of the instrument Vitek 2 AST-N239 for Gram negative bacteria.

CONCLUSION

Although uncommon, *E. meningoseptica* is an important pathogen responsible for infections in hospitalized patients. Therefore it should always be considered in the etiological diagnosis of septicemia, which is essential on clinical cases similar to those described in this article, in long-stay hospital patients with comorbidities, who are not responsive to empirical therapy and do not have a microbiological diagnosis defined. This results in an inappropriate choice of antimicrobial therapy, which may lead to negative consequences on the morbidity and mortality of patients infected by this pathogen.

RESUMO

Reportamos dois casos de sepse em pacientes criticamente debilitados em dois hospitais com nível de complexidade terciária em Recife-PE, Brasil. O primeiro caso, paciente de 87 anos com leucemia mieloide crônica e sepse; o segundo, paciente com 93 anos de idade com câncer de próstata apresentava choque séptico causado por Elizabethkingia meningoseptica *multirresistente.*

Unitermos: Elizabethkingia meningoseptica*; sepse; leucemia mieloide; câncer.*

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