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Case Report

ISOLATION OF ELIZABETHKINGIA MENINGOSEPTICA FROM A CLINICAL SAMPLE IN BULGARIA

A. Trifonova, E. Kioseva, E. Savov*

Military Medical Academy, Sofia, Bulgaria

ABSTRACT

Elizabethkingia meningoseptica is a Gram-negative non-fermenenting bacterium widely distributed in nature and in hospital environment. In this paper we report on a case of *Elizabethkingia meningoseptica* isolation from a throat swab sample in a patient with acute myeloid leukemia. The isolate was identified as *Elizabethkingia meningoseptica* by Vitek 2 system (Bio-Merieux, France). Antimicrobial susceptibility testing showed sensitivity to ciprofloxacin, levofloxacin and cefoperazone/sulbactam and resistance to amikacin, gentamicin, tobramycin, ceftazidime, colistin and cefepim.

Key words: *Elizabethkingia meningoseptica*, diagnosis, resistance

INTRODUCTION

Elizabethkingia meningoseptica, previously known as *Chryseobacterium menigosepticum*, is a gram-negative, nonfermentative glucose bacterium, which is widely distributed in nature (1). *E. meningoseptica* was firstly described as *Flavobacterium meningosepticum* in 1959 by Elizabeth O. King, associated with meningitis in infants (2). It is ubiquitously distributed in nature (fresh water, salt water and soil). It can be isolated in fish and frogs but is not normally present in human microflora (3). During the last years, however, there were many cases related to nosocomial infections, especially in immune-compromised adults, like pneumonia, endocarditis, bacteremia, peritonitis and others, caused by *E. meningoseptica* (4-6). *E. meningoseptica* usually is resistant to many antimicrobial drugs, including those, frequently used for the treatment of Gram-negative bacterial infections.

CASE REPORT

A 42-year-old woman was admitted to the Department of Hematology and Medical Oncology at the Military Medical Academy (MMA) Sofia, Bulgaria after outpatient examination of the complete blood investigation with evidence of leucocytosis, moderate anemia and thrombocitopenia on 5 October, 2016. The patient had a sore throat and cough, without high grade fever. The results of laboratory tests performed on admission showed the following values: urine – without specifics, haemoglobin 118 g/dl (normal range 130-170g/dl), leucocite count 10.2 g/L (normal range 3.5-10.5 g/L), thrombocytes 149 g/L (normal range 140-400g/L), C-reactive protein 2.9 mg/L (normal range<10mg/L), creatinine 96 μmol/L (normal range 60-110 μmol/L) electrolytes – within normal range, hemostasis – in reference limits. The myelogram done of 6 October showed cytological data of acute myeloid leukemia M2 according FAB. Results of virological tests with respect to EBV, HBV, HCV and HIV were all negative. The results regarding Herpes simplex virus (HSV) and Cytomegalovirus (CMV) were positive for IgG. It was prescribed antiviral prophylaxis with Aciclovir. The results of microbiological investigations at the same moment were as follows: throat swab and sputum – *Streptococcus pyogenes*; from 19 October – normal throat flora, hemoculture – *Staphylococcus epidermidis MRS* (Vancomycin S); from 27 October – hemoculture does not generate bacterial growth; from 28 October – urine culture with *Candida albicans*, stool culture performed twice – negative for pathogenic intestinal bacteria. It was included gastrointestinal decontamination with gentamicin per os, antibacterial prophilaxis with levofloxacin and

***Correspondence to**: *Encho Savov, Military Medical Academy, Sofia, Bulgaria, mob – +359 88 920 1187, e-mail: savove@yahoo.com*

fluconazole. On 28 October the laboratory of microbiology received throat swab sample from the patient. The sample cultured on sheep blood agar showed smooth, circular yellowish non-hemolytic colonies after overnight incubation, whereas there was no growth on MacConkey agar plates. The Gram stain and the test with 3% NaOH showed that the strain is Gram negative. It was positive by the oxidase test, catalase and indol test. It was demonstrated an increasing of alkaline product on Hugh-Leifson oxidative/fermentative (OF) medium, it was negative for nitrogen gas production on the Sellers medium and without changes on the KIA medium. The isolate was identified as *Elizabethkingia meningoseptica* by Vitek 2 system (bioMerieux, France). Antimicrobial susceptibility testing by Vitek 2 showed sensitivity to ciprofloxacin and levofloxacin with MIC = 1 and resistance to amikacin (MIC≥64), gentamicin (MIC≥16), tobramycin (MIC≥16), ceftazidime (MIC ≥64), and cefepim (MIC≥64). Antimicrobial susceptibility testing to colistin, cefoperazon/sulbactam and vancomycin was performed on Mueller-Hinton blood agar by the Kirby-Bauer disc-diffusion method, according CLSI guidelines, gave sensitivity to vancomycin, cefoperazon/sulbactam and resistance to colistin. The patient was treated with meropenem 3x1 g i.v., vancomycin 2x1g i.v., and Voriconazole (Vfend) 2x 0.200g i.v. Additionally, she received for leukemia treatment cytarabine 100mg/m2 i.v. D1-D7 and doxorubicin 90mg/m2 iv D1-D3. The patient was discharged with the recommendations for the treatment with levofloxacin and checkup in the hospital.

DISCUSSION

E. meningosepticum is found ubiquitously in the nature – fresh and saltwater and soil. Because its survival in hospital environments, nosocomial outbreaks can occur as result of exposure to contaminated water source or medical devices (6). The infections, caused by this bacterium, whether in infants or adults, are mostly nosocomial with less than 15% acquired in the community (7). In adults, most infections due to *E. meningoseptica* particulary affect immunocompromised individuals. Potential risk factors for developing *E. meningoseptica* infections or accepted as predisposing factors include malignancies, diabetes mellitus, organ transplant (5-7). In our case we can estimate that isolation of *E. meningoseptica* is rather colonization but not infection in patient which is immunocompromised with leucemia, moreover she had also history from 2005 becoming a liver donor for her child with removed left lobe and cholecystectomy. Infection with *E. meningoseptica* is clinically important as the organism is intrinsically resistant to multiple antibiotics, such as beta-lactams, aminoglycosides, tetracycline, tigecycycline, colistin, cloramphenicol and carbapenems (5-8). These resistance phenotypes can be explained by the presence of beta-lactamases, including ESBLs and metallo-beta-lactamases. It is important that it is susceptible to the drugs, used to treat Gram-positive bacteria like rifampicin, ciprofloxacin, vancomycin and trimethoprim-sulfamethoxazol **(Figure 1).** Vancomycin alone or in combination with other agents, has in the past been successful in treatment, but its efficacy has been questioned by recent studies (9). There is no consensus and optimal antimicrobial guidelines to treat *E. meningoseptica* remain to be established (6). Because our isolate was adopted as colonization, but in immunocompromised patient, we accepted as an opportunity for initial treatment vancomycin in combination with subsequent use of levofloxacin, based on the antibiogram.

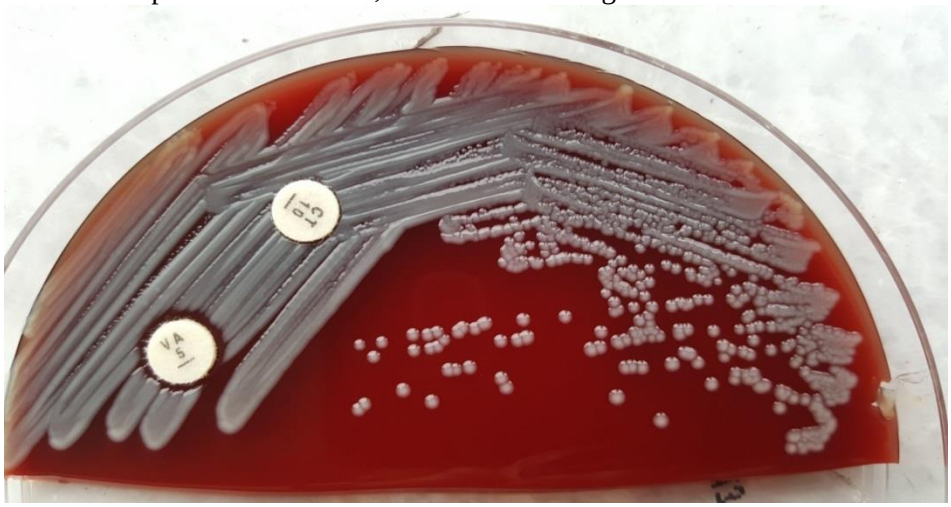

Figure 1. *Elizabethkingia meningoseptica* growth on blood agar with demonstration of Vancomycin sensitivity and colistin resistanc

CONCLUSIONS

E. meningoseptica is usually found in hospital environment. It has been associated with severe nosocomial infections, connected with contaminated medical devices. Therefore, its pathogenic role associated with its isolation from clinical specimens should be thoroughly evaluated (6). On the other hand, Hayek et al. (2013) consider that *E. menimgoseptica* is a virulent pathogen not only in immunocompromised host, but also in immunocompetent patients (4). Because the clinical and laboratory manifestations of *E. meningoseptica* infections are not pathognomonic, the early and rapid microbiological diagnosis is essential in the selection of an appropriate antibiotic therapy using one of the next antibacterials – levofloxacin, vancomycin, rifampicin or trimethoprim-sulfametoxazole, alone or in combination.

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