

# Elizabethkingia meningoseptica Bacteremia in an Immuno-competent Patient

Venkateswara Rao<sup>1</sup>, Radharani Dandamudi<sup>2</sup>, Praveen Koppula<sup>3</sup>

Departments of <sup>1</sup>Neurosurgery, <sup>2</sup>Microbiology and <sup>3</sup>Internal Medicine & Critical care, Basavatarakam Indo-American Cancer Hospital and Research Institute, Banjara Hills, Hyderabad-500034, India.

## Corresponding Author:

Dr. Venkateswara Rao  
Email: drvenkys@gmail.com

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (creativecommons.org/licenses/by/3.0).

Received : March 3, 2017  
Accepted : May 8, 2017  
Published : June 5, 2017

## Abstract

**Background:** *Elizabethkingia meningoseptica* infections are not common but are clinically important because the organism is naturally resistant to multiple antibiotics. A prompt diagnosis is important so as to give appropriate antibiotic treatment. **Case Report:** We report a case of central line associated *Elizabethkingia meningoseptica* infection in a patient who was admitted with recurrent oligodendroglioma and underwent right frontal craniotomy and surgical decompression of tumor. **Conclusion:** *Elizabethkingia meningoseptica* infection should always be considered in the etiological diagnosis of septicemia who do not respond to empirical therapy as this results in an inappropriate choice of antimicrobial therapy, which may lead to increased morbidity and mortality of patients infected by this pathogen.

**Keywords:** Bacteremia, Central Venous Catheters, Chryseobacterium, Oligodendroglioma, Sepsis.

## Introduction

*Elizabethkingia meningoseptica* (formerly *Flavobacterium meningosepticum* and, during 1994-2005 *Chryseobacterium meningosepticum*) [1] is a gram-negative non-fermenting obligate aerobe. It is widely distributed in the environment, and is an opportunistic human pathogen [2]. It has been reported as a causative agent of meningitis in premature and newborn infants [3]. In adults, it has been isolated from cases of pneumonia, endocarditis and meningitis, usually in association with some underlying severe illness [4]. The organism is inherently resistant to many anti-microbial agents commonly used to treat infections. Infection with this pathogen is potentially fatal unless diagnosed and treated early. The incidence of *Elizabethkingia meningoseptica* may be underreported as correct identification is difficult unless an automated system is used.

## Case Report

A 46 year old male patient, a case of oligodendroglioma underwent surgery and radiotherapy in 2013, now presented with headache associated with seizures. On thorough investigations, patient was found to have recurrent oligo-dendroglioma. Patient underwent right fronto-temporal craniotomy and surgical decompression of tumor. On 5<sup>th</sup> post-operative day, patient complained of headache associated with vomiting. CT brain showed pneumocephalus. Total leucocyte count (TLC) was 13,200 cells/mm<sup>3</sup> (4500-11000), hemoglobin 15.5 g/dL (13-15), sodium 138 meq/L (145-150), potassium 4.6 meq/L (3.5-5.5) and chlorides were 107 meq/L (96-106). Patient was drowsy and not obeying commands and hence shifted to intensive care unit (ICU). Post-operatively patient was started on injection ceftriaxone two gms intravenous twice daily. On 7<sup>th</sup> post-operative day in intensive care unit

patient developed high grade fever and antibiotics were changed to cefoperazone plus sulbactam combination and amikacin. Symptoms persisted with increasing TLC counts, thrombocytopenia and raised pro-calcitonin levels: 1.39 ng/mL ( $< 0.15$ ) suggestive of sepsis.

Two sets of blood samples one from central line and one from peripheral line cultured by an automated method (Bact/ Alert 3D, Biomerieux) flagged positive within 24-30 hours. Colonies on sheep blood agar plates (biomerieux) were 1-2 mm, circular, and non-hemolytic after overnight incubation at 37°C, and there was no growth on MacConkey agar plates. The isolate was Gram negative bacillus with non-fermenting reactions on TSI slant, non-motile, catalase positive, oxidase positive, Indole positive, urease and citrate negative. The isolate from both the samples was identified as being the same and antimicrobial susceptibility testing was carried out by Kirby-Bauer disc diffusion method on Muller Hinton agar as per Clinical Laboratory Standards Institute (CLSI) guidelines. Identification and sensitivity was further confirmed by the fully automated BD phoenix 100. The organism was identified as *Elizabethkingia meningosepticum* and it was sensitive only to cotrimoxazole (MIC-2/38). As per the culture and sensitivity report vancomycin and cotrimoxazole were added. Patient responded well and was discharged. After discharge patient was kept on cotrimoxazole for two weeks. Patient is doing well in the subsequent visits.

## Discussion

*Elizabethkingia* is a bacterial genus that is commonly detected in the environment (particularly soil and water) but that rarely causes human infection [5]. *E. meningoseptica* is resistant to multiple antibiotics and has been previously described as a pathogen of neonatal meningitis and sepsis [5], as well as a cause of infection among immunocompromised patients [6]. In hospital environment, it occurs on moist surfaces and water,

and colonization in patients was also demonstrated by means of contaminated medical equipment [7,8]. Some reports of infections due to *Elizabethkingia meningosepticum* have been published. Krebs *et al.* reported a case of bacteremia and meningitis by *E. meningosepticum*, in a patient with history of acute myeloid leukemia [9]. Echeverri *et al.* reported a case of bacteremia in a patient with history of acute lymphoblastic leukemia, initially treated with moxifloxacin, then combined with vancomycin and sulfamethoxazole [10]. *E. meningoseptica* bacteremia has also been described in patients requiring chronic hemodialysis therapy [11-16]. A study from Taiwan on the analysis of adult patients with *E. meningoseptica* bacteremia showed that 86% of the patients had nosocomial infections and 60% had acquired the infection in the ICUs [17]. In our study also the patient was in ICU at the time of development of bacteraemia.

*E. meningoseptica* is inherently resistant to many antibiotics and only a limited range of antibiotics are available for treatment. Studies have shown that more than 80% of the isolates were susceptible to trimethoprim-sulfamethoxazole, moxifloxacin, and levofloxacin [18]. In our study, the isolate was susceptible only to cotrimoxazole which is contrary to other studies which have shown that the isolate was susceptible to piperacillin, piperacillin-tazobactam, trimethoprim-sulfamethoxazole, and ciprofloxacin [18].

## Conclusion

In our patient central line was the risk factor for *Elizabethkingia meningosepticum* bacteraemia. Contrary to other studies our isolate was sensitive only to cotrimoxazole and was also resistant to ciprofloxacin. Though uncommon, *E. meningoseptica* is an important pathogen, especially in hospitalized immuno-competent patients with indwelling devices. It should always be considered in the etiological diagnosis of septicemia who do not respond to empirical

therapy as this results in an inappropriate choice of antimicrobial therapy, which may lead to increased morbidity and mortality of patients infected by this pathogen.

*Contributors:* VR: manuscript writing, case management and intellectual input; RD: manuscript editing and literature search. PV: critical inputs into the manuscript and case management. VR will act as guarantor. All authors approved final version of the manuscript.

*Funding:* None; *Competing interests:* None stated.

## References

1. Moore LSP, Owens DS, Jepson A, Turton JF, Ashworth S, Donaldson H, *et al.* Waterborne Elizabethkingia meningoseptica in Adult Critical Care. *Emerg Infect Dis.* 2016;22:9-17.
2. Henriques IS, Araújo S, Azevedo JSN, Alves MS, Chouchani C, Pereira A. Prevalence and diversity of carbapenem-resistant bacteria in untreated drinking water in Portugal. *Microb Drug Resist.* 2012;18:531-537.
3. Thong ML, Pudthueary SD, Lee EL. Flavobacterium meningosepticum infection: An epidemiological study in a newborn nursery. *J Clin Pathol.* 1981;34:429-433.
4. Weaver KN, Jones RC, Albright R, Thomas Y, Zambrano CH, Costello M, *et al.* Acute emergence of Elizabethkingia meningoseptica infection among mechanically ventilated patients in a long term acute care facility. *Infect Control Hosp Epidemiol.* 2010;31:54-58.
5. Dipentima MC, Mason EO, Kaplan SL. In vitro antibiotic synergy against Flavobacterium meningosepticum: implications for therapeutic options. *Clin Infect Dis.* 1998;26:1169-1176.
6. Bloch KC, Nadarajah R, Jacobs R. Chryseobacterium meningosepticum: an emerging pathogen among immunocompromised adults. Report of 6 cases and literature review. *Medicine (Baltimore).* 1997;76:30-41.
7. Tuon F, Campos L, Duboc G, Gryscek R. Chryseobacterium meningosepticum as a cause of cellulitis and sepsis in an immunocompetent patient. *J Med Microbiol.* 2007;56:1116-1117.
8. Yoon, HS. Two cases of Chryseobacterium meningosepticum infection in a neonatal intensive care unit. *Korean J Pediatr.* 2007;50:7.
9. Krebs S, Blanche P, Bouscary D, Blanchard H. Flavobacterium meningosepticum meningitis in an adult with acute leukemia. *Postgrad Med J.* 1996;72:187-188.
10. Echeverri, LM, Ospina S. Bacteremia by Elizabethkingia meningoseptica in acute lymphoblastic leukemia patients. *Infectio.* 2010;14:227-231.
11. Perera S, Palasuntheram C. Chryseobacterium meningosepticum infections in a dialysis unit. *Ceylon Med J.* 2004;49:57-60.
12. Lee SW, Tsai CA, Lee BJ. Chryseobacterium meningosepticum sepsis complicated with retroperitoneal hematoma and pleural effusion in a diabetic patient. *J Chin Med Assoc.* 2008;71:473-476.
13. Jean SS, Lee WS, Chen FL, Ou TY, Hsueh PR. Elizabethkingia meningoseptica: an important emerging pathogen causing healthcare-associated infections. *J Hosp Infect.* 2014;86:244-249.
14. Bayrak B, Fincanci M, Binay UD, Cimen C, Ozkantar U, *et al.* Elizabethkingia meningosepticum bacteremia in a patient with Bardet-Biedl syndrome and chronic renal failure. *Mikrobiyol Bul.* 2014;48:495-500.
15. Boroda K, Li L. Elizabethkingia meningosepticum in a patient with six-year bilateral perma-catheters. *Case Rep Infect Dis.* 2014;2014:985306.
16. Ratnamani MS, Rao R. Elizabethkingia meningoseptica: emerging nosocomial pathogen in bedside hemodialysis patients. *Indian J Crit Care Med.* 2013;17:304-307.
17. Lin YT, Chiu CH, Chan YJ, Lin ML, Yu KW, Wang FD, *et al.* Clinical and microbiological analysis of Elizabethkingia meningoseptica bacteremia in adult patients in Taiwan. *Scand J Infect Dis.* 2009;41:628-634.
18. Lin PY, Chen HL, Huang CT, Su LH, Chiu CH. Biofilm production, use of intravascular indwelling catheters and inappropriate antimicrobial therapy as predictors of fatality in Chryseobacterium meningosepticum bacteremia. *Int J Antimicrob Agents.* 2010;36:436-440.