Case Report: Elizabethkingia Meningoseptica Meningitis in a Late Preterm Infant with Associated Complications: A Rare Clinical Case.

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ABSTRACT

Introduction: Elizabethkingia meningoseptica (EM) is a gram-negative aerobic organism commonly found in environment that can cause, outbreaks of neonatal meningitis and septicemia in immunocompromised children and adults. Although the incidence is higher in developing countries, having been isolated on contaminated medical equipments, especially in neonates.

Case report: We have reported the case of a male neonate, born late preterm at 35 weeks and 3 days of gestation, diagnosed with hydrocephalus, underwent a surgical intervention for hydrocephalus in the early neonatal period. On the 28th day of life, the infant presented with fever and increased irritability. He was admitted to the NICU and commenced on intravenous amikacin. Blood cultures remained sterile; however, due to clinical suspicion of central nervous system infection, CSF culture was sent. CSF culture revealed growth of Elizabethkingia meningoseptica, identified via the VITEK automated system, confirming neonatal meningitis and timely managed with antibiotic therapy based on susceptibility testing.

Conclusions: Elizabethkingia meningoseptica is associated with high morbidity and mortality, particularly in neonates. Early identification of the causative organism is critical for improving clinical outcomes.

Keywords: Bacterial Meningitis, Neonate, Elizabethkingia meningoseptica.

INTRODUCTION

Previously known as Flavobacterium meningosepticum, Elizabethkingia meningoseptica is a Gram-negative, oxidase-positive, non-motile, and non-fermentative rod-shaped bacterium classified under the genus Elizabethkingia.[1] This bacterium can be found in many places, including tap water (even if treated with chlorine), medical equipment like catheters and incubators. While it's best known for causing meningitis and sepsis in neonate and young children, it can also lead to serious infections in older adults, who are more vulnerable due to weaker immune systems and other health issues.[2]

Infection in immunocompromised individuals is particularly challenging due to the organism's intrinsic multidrug resistance. It exhibits resistance to several antibiotic classes, notably beta-lactams, carbapenems, and aminoglycosides. Despite this, certain agents—including vancomycin, rifampicin, newer-generation fluoroquinolones, piperacillin-tazobactam, minocycline, and tigecycline—have demonstrated efficacy. Evidence suggests that combination therapy yields more favorable outcomes compared to monotherapy.[3, 4]

CASE REPORT

A 28-day-old male infant, was admitted to the Neonatal Intensive Care Unit (NICU) at Parul Sevashram Hospital on 3rd April 2025. He was born at out side hospital as a late preterm infant at 35 weeks and 3days of gestation via lower segment cesarean section (LSCS) due to breech presentation. At birth, the infant was diagnosed with hydrocephalus. He had undergone ventriculoperitoneal (VP) shunting at an outside hospital. On admission at PSH, the baby presented with complaints of fever and irritability. He was started on intravenous antibiotic therapy with Amikacin.

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Initial blood investigations revealed a total leucocyte count of 25,230/mm³ and an elevated C-reactive protein (CRP) level of 60.86 mg/L. Blood culture was sent for microbiological analysis. The vital signs recorded at admission were: pulse rate of 140 bpm, temperature of 98.6°F, respiratory rate of 52 breaths per minute, and SpO_2 of 96% on room air. The baby's weight was noted to be 2.388 kg.

On 4th April 2025, CSF routine microscopy showed a total cell count of 30 cells/mm³, with 95% polymorphonuclear cells and 5% lymphocytes. The CSF glucose level was 20 mg/dL, and protein was markedly elevated, measured at more than 240 mg/dL suggested bacterial infection. The CSF sample was sent for culture and sensitivity (C/S). Sample was inoculated into blood culture bottle, which was loaded into the BacT/ALERT automated culture system for incubation and monitoring. After approximately one and a half days, the culture flagged positive. Gram staining from that positive bottle, revealed gram-negative bacilli(fig 1).

The positive CSF sample was then streaked onto blood agar, nutrient agar, chocolate agar, and MacConkey agar. Growth was observed on blood agar, nutrient agar, and chocolate agar characterized by smooth, round, non-hemolytic colonies(fig 2) with the organism exhibiting no motility. The isolate was identified as Elizabethkingia meningoseptica through the VITEK ID/AST system and confirmed by Biochemical testing. The isolate demonstrated a positive oxidase test, while the catalase, indole, urease, and citrate tests were negative.

Antibiotic sensitivity testing performed on the VITEK system revealed that the organism was sensitive to levofloxacin, ciprofloxacin, and minocycline. It showed intermediate sensitivity to cefoperazone-sulbactam(fig 3), while it was resistant to amikacin, gentamicin, meropenem, and imipenem. Based on these results, the clinical pediatric team was advised to adjust the antibiotic therapy accordingly as per the AST report. The targeted antimicrobial therapy was initiated with levofloxacin and minocycline based on the antimicrobial susceptibility testing (AST) results. Subsequent to the commencement of appropriate therapy, the patient exhibited notable clinical improvement. Serial laboratory investigations demonstrated a decline in total leukocyte count to 17,000/mm³, and serum C-reactive protein (CRP) levels decreased to 1.40mg/L. Repeat CSF analysis revealed a cell count of 10 cells/mm³, glucose concentration of 40 mg/dL, and protein level less than 142mg/dL. These findings correlated with the patient's favorable clinical progression and discharged clinically after approximately one month of treatment.

Fig.1: Colony Gram stain reveals gram negative bacilli

Fig.2: Round , Non- hemolytic colony on blood agar

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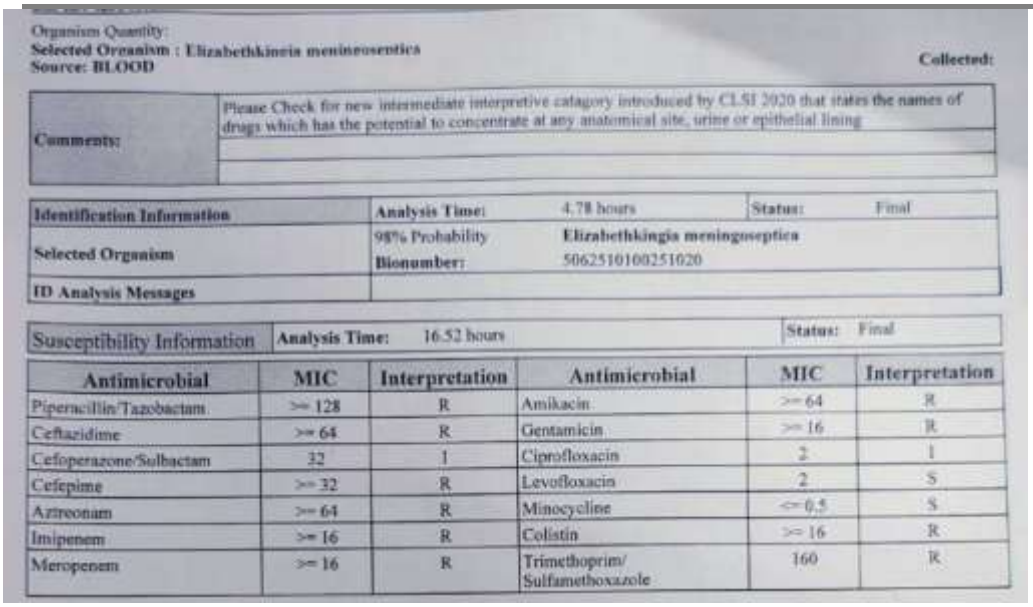

Organism Quantity:
Selected Organism : Elizabethkingia meningoseptica
Source: BLOOD
Collected:

Comments:	Please Check for new intermediate interpretive catagory introduced by CLSI 2020 that states the names of drugs which has the potential to concentrate at any anatomical site, urine or epithelial lining

Identification Information	**Analysis Time:**	4.78 hours	**Status:**	Final
Selected Organism	98% Probability **Bionumber:**	**Elizabethkingia meningoseptica** 5062510100251020		
ID Analysis Messages				

Susceptibility Information	**Analysis Time:**	16.52 hours	**Status:**	Final

Antimicrobial	MIC	Interpretation	Antimicrobial	MIC	Interpretation
Piperacillin/Tazobactam	>= 128	R	Amikacin	>= 64	R
Ceftazidime	>= 64	R	Gentamicin	>= 16	R
Cefoperazone/Sulbactam	32	I	Ciprofloxacin	2	I
Cefepime	>= 32	R	Levofloxacin	2	S
Aztreonam	>= 64	R	Minocycline	<= 0.5	S
Imipenem	>= 16	R	Colistin	>= 16	R
Meropenem	>= 16	R	Trimethoprim/ Sulfamethoxazole	160	R

Fig.3 : Antimicrobial sensitivity report of Vitek

Parameter	**Day 1 (Admission)**	**Day 3 (After Diagnosis)**	**Day 30(before discharged)**
CSF Cell Count(cells/mm^3)	30	500	10
CSF Glucose (mg/dl)	20	>20	40
CSF Protein (mg/dl)	>240	457	142
CRP (mg/L)	60.86	30.6	1.40
Total Leukocyte Count(/mm^3)	25,230	22,000	17,000

Table 1.1 : Continue monitoring of Parameter

DISCUSSION:

Elizabethkingia meningoseptica is a non-fermentative, Gram-negative bacillus that has emerged as a significant nosocomial pathogen, particularly affecting neonates, immunocompromised adults, and patients with prolonged hospitalizations or invasive procedures. It is inherently resistant to multiple classes of antibiotics traditionally used to treat Gram-negative infections, making its management challenging.[5]

Our case highlights the importance of early detection through appropriate microbiological techniques, allowing for timely initiation of targeted antimicrobial therapy. Upon identification of E. meningoseptica and review of the antimicrobial susceptibility profile, treatment was initiated with levofloxacin and minocycline, leading to marked clinical and laboratory improvement. The observed decrease in inflammatory markers (CRP 1.40 mg/L), CSF parameters (cell count reduced to 10cells/mm³, glucose 20 mg/dL, protein 142 mg/dL), and normalization of leukocyte count (17,000/mm³) correlated with clinical recovery.

Similar findings have been reported by Bloch et al. (1997), who revealed the most efficacious antibiotics to be minocycline (100% sensitive), rifampin (93%), trimethoprim-sulfamethoxazole (67%), and ciprofloxacin (53%). were widespread resistance to vancomycin (100% resistant or intermediately sensitive), erythromycin (100%), and clindamycin (86%). Hsu et al. (2011) also emphasized the 14-day mortality was higher among patients receiving carbapenems ($p = 0.046$) than fluoroquinolones or other antimicrobial agents. More than 80% of the isolates tested were susceptible to trimethoprim-sulfamethoxzole, moxifloxacin, and levofloxacin. .

The organism's intrinsic resistance mechanisms, including the production of extended-spectrum beta-lactamases and metallo-beta-lactamases, necessitate reliance on antimicrobial stewardship and susceptibility-guided therapy.[6] In our case, the selection of levofloxacin and minocycline, to which the isolate was susceptible, underscores the need for case-specific antimicrobial strategies rather than empirical treatment alone.

Moreover, this case reinforces the clinical importance of considering Elizabethkingia meningoseptica as a differential diagnosis in nosocomial meningitis cases, especially when initial empirical therapies fail. Close microbiological surveillance and interdisciplinary collaboration between clinicians and microbiologists are crucial for improving patient outcomes.[7]

CONCLUSION

This case highlights the importance of considering Elizabethkingia meningoseptica in the differential diagnosis of neonatal meningitis, especially in patients with neurosurgical interventions such as VP shunting. Given the organism's multidrug-resistant profile, early detection using automated systems like VITEK and timely adjustment of antibiotic therapy based on susceptibility results are critical for successful outcomes. This case underscores the need for vigilant microbiological surveillance and infection control practices in NICUs to prevent such opportunistic infections in vulnerable neonatal populations.

REFERENCES

1. Bloch KC, Nadarajah R, Jacobs R. Chryseobacterium meningosepticum: an emerging pathogen among immunocompromised adults. Medicine (Baltimore). 1997;76(1):30-41.
2. Lin PY, Chu C, Su LH, Huang CT, Chang WY, Chiu CH. Clinical and microbiological analysis of Elizabethkingia meningoseptica bacteremia in adult patients. Scand J Infect Dis. 2010;42(9):702-706.
3. Hsu MS, Liao CH, Huang YT, Liu CY, Yang CJ, Kao KL, Hsueh PR. Clinical features and outcomes of Elizabethkingia meningoseptica bacteremia at a medical center in Taiwan. Eur J Clin Microbiol Infect Dis. 2011;30(10):1271-1278.
4. 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(4):244-249.
5. Kim KK, Kim MK, Lim JH, Park HY, Lee ST. Transfer of Chryseobacterium meningosepticum and Chryseobacterium miricola to Elizabethkingia gen. nov. Int J Syst Evol Microbiol. 2005;55(Pt 3):1287-1293.
6. Lau SKP, Chow WN, Foo CH, Curreem SOT, Lo GCS, Teng JLL, et al. Elizabethkingia anophelis bacteremia is associated with clinically significant infections and high mortality. Sci Rep. 2016;6:26045.
7. Han MS, Kim H, Lee Y, Kim M, Ku NS, Choi JY, et al. Relative prevalence and antimicrobial susceptibility of clinical isolates of Elizabethkingia species based on 16S rRNA gene sequencing. J Clin Microbiol. 2017;55(1):274-280.
8. Chen S, Xu L, Wang L, Hou Y, Liu J. Identification and antimicrobial susceptibility of Elizabethkingia meningoseptica isolated from a case of hospital-acquired pneumonia. BMC Infect Dis. 2019;19(1):1-5.
9. Kirby JT, Sader HS, Walsh TR, Jones RN. Antimicrobial susceptibility and epidemiology of a worldwide collection of Chryseobacterium spp. Clinical Infectious Diseases. 2004;39(5):701-707.
10. Weaver KN, Jones RC, Albright R, Thomas Y, Zambrano CH, Costello M, et al. Successful treatment of Elizabethkingia meningoseptica infections in neonates: case reports and review of the literature. Infection. 2010;38(3):219-224.
11. Lin YT, Chiu CH, Chan YJ, Lin ML, Tu CC, Lee YT. Clinical and microbiological characteristics of Elizabethkingia meningoseptica infections in adults in Taiwan. J Clin Microbiol. 2009;47(6):2051-2053.
12. Ratnamani MS, Rao R. Elizabethkingia meningoseptica: emerging nosocomial pathogen in bedside hemodialysis patients. Indian J Crit Care Med. 2013;17(5):304-307.
13. Green O, Murray PR. Elizabethkingia meningoseptica: an emerging cause of nosocomial infection. Clin Microbiol Newsl. 2005;27(16):129-131.
14. Teo J, Tan SY, Liu Y, Tay M, Ding Y, Li Y, et al. Comparative genomic analysis of Elizabethkingia anophelis strain NUHP1, isolated from a Singapore patient. Genome Biol Evol. 2014;6(4):932-948.