## Case Report

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# Elizabethkingia meningoseptica: an emerging threat

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#### **ABSTRACT**

Infection by *Elizabethkingia meningoseptica* (*E.meningoseptica*) is very rare. It is associated with neonatal meningitis and other infections, especially in preterm neonates.

We report a case of preterm neonate infected by *E.meningoseptica* clinically presented with meningitis and necrotizing enterocolitis. The patient succumbed in spite of timely diagnosis and institution of appropriate antibiotics. Although rare but infections casued by *E.meningoseptica* are often severe and life threatening. It should be considered as an emerging threat and efforts to identify and prompt treatment should be considered in neonates suffering from meningitis.

Keywords: Elizabethkingia meningoseptica, Meningitis, Preterm

## INTRODUCTION

*Elizabethkingia meningoseptica* is a gram-negative, nonfermenting, nonmotile, oxidase positive bacilli. It is increasingly being recognized as a pathogen in hospitalized patients.

It has been isolated from hospital water supplies, sinks, taps, and medical devices, including feeding tubes, arterial catheters, and respiratory therapy equipment's. Studies have revealed that the organism can even survive in chlorine-treated municipal water supplies, humidifiers, incubators and syringes.

In newborns, meningitis is the most common disease caused by this organism. Bacteremia and pneumonia are the other common manifestations in neonates. Infections usually affect premature infants and often occur as outbreaks.<sup>1</sup> It has been implicated in meningitis, endocarditis, cellulitis, abdominal infection, wound infection, sinusitis, epididymitis, dialysis associated peritonitis, septic arthritis, and eye infections in severely immunocompromised patients such as end-stage hepatic

and renal disease, extensive burns, and acquired immune deficiency syndrome, as well as community-acquired necrotizing fasciitis, pneumonia, and bacteremia. This organism is resistant to many antimicrobial agents, including those frequently used to target Gram-negative bacterial infections. Here we report a case with this emerging pathogen in a preterm neonate, which is the first case in our NICU.

#### **CASE REPORT**

A nine days old preterm (32 weeks) male neonate weighing 1.55 kg admitted in our NICU with history of convulsion, refusal to feed and lethargy. Baby was treated for three days in other hospital and then referred for further management to our hospital which is a tertiary care teaching hospital.

Patient was investigated for complete blood count, I: T cell ratio, band cells, C - reactive protein (CRP) and blood culture. Lumbar puncture was done considering clinical diagnosis of late onset septicemia and meningitis. Cerebrospinal fluid (CSF) samples were sent for

microbiological examinations including cell count, gram stain, and CSF culture. CSF sample was tested for sugar and protein.

Prompt medical care was started in form of Intravenous fluid and intravenous antibiotics. Intravenous antibiotics used were Inj. Meropenem 40mg/kg/dose every 8 hourly and Inj. Amikacin sulphate 15mg/kg/day. Blood count revealed total count of 4000/cmm, I:T ratio 2.0, Band cells were 10%, CRP was 67, CSF examination revealed 3000cells/cmm of which 90% were neutrophils. CSF sugar was 28mg/dl, and protein was 200mg/dl. Gram stain of CSF was suggestive of gram negative organisms and CSF culture was positive at 72 hours for *Elizabethkingia meningoseptica*, confirming the clinical diagnosis of bacterial meningitis.

Patient's condition gradually deteriorated with worsening neurological status and poor perfusion, for which baby was ventilated and treated for shock with fluid boluses and vasopressors. On the 3<sup>rd</sup> day of admission the baby developed abdominal distention and absence of peristalsis. Abdominal X ray was suggestive of necrotizing enterocolitis with air under diaphragm suggesting NEC and perforation. Bed side emergency peritoneal drainage was done by pediatric surgeon. The baby continued to deteriorate hemodynamically and neurologically, and succumbed on 7<sup>th</sup> day of admission.

#### **DISCUSSION**

*E. meningoseptica* is a rare organism causing infections in newborns commonly causing meningitis.<sup>2</sup> Infections are severe especially in preterm neonates and occurring in first two weeks of life with a high mortality rate.<sup>3,4</sup> Generally *E. meningoseptica* infections are supposed to be nosocomial and affect immunocompromised hosts.

Infection with *E. meningoseptica* may manifest with endocarditis, cellulitis, wound infections, bacteraemia following burns, abdominal abscesses, dialysis-associated peritonitis, endophthalmitis, and meningitis.<sup>5</sup> Though the exact source of the infections in the NICUs has not been elucidated in most of the epidemics, it has been isolated from faucets, sinks, respiratory therapy equipment, feeding bottles, contaminated syringes and antiseptic solutions. A person-to-person spread is unusual with this pathogen.<sup>6</sup>

Elizabethkingia meningosepticum has a peculiar antibiotic profile. The bacteria are inherently resistant to most of the antibiotics which are prescribed to treat gram negative bacteria, like amino glycosides,  $\beta$ -lactam agents, chloramphenicol and carbapenems, but it is susceptible to the agents which are used to treat gram positive bacteria (rifampicin, ciprofloxacin, vancomycin, trimethoprim–sulfamethoxazole). Thus, the right choice of the antibiotic for treating is difficult. The results of the susceptibility testing vary when different methods are used; further complicating the choice of the antibiotic. The disc

diffusion methods are unreliable and broth micro dilution is the preferred method.<sup>7</sup> Clinicians should maintain a high level of suspicion for the *E. meningosepticum* infection when gram negative bacilli are detected on gram staining or in culture, particularly in preterm neonates. A failure to identify this pathogen may lead to an incomplete antibiotic coverage, with high rates of morbidity and mortality. *E. meningosepticum* could be considered as an emerging threat.

In view of its multidrug-resistant nature, and its ability to infect preterm neonates, as in our case, and to spread in the hospital environment, its prompt diagnosis in clinical samples and sensitivity testing along with reinforcement of standard infection control measures are essential to reduce the morbidity and mortality associated with such infections. Active infection control measures like regularly inspecting the hospital water tanks, water surveillance, and hyperchlorinating the water might be required for controlling infection with these challenging bacteria. Further studies are required to define the epidemiology, risk factors and antimicrobial resistance patterns associated with this organism.

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