Case Report

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Microbiology Section

Case Series: *Elizabethkingia Meningosepticum*

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ABSTRACT

Elizabethkingia meningosepticum is a saprophyte which exists in hospital water systems and it can be a potential source for nosocomial infections. Though the infection with these bacteria is rare, one should be aware that it is resistant to most of the antibiotics and that it has the ability to cause nosocomial infections. We are reporting here, a series of cases which were caused by E. meningosepticum.

Key Words: *Elizabethkingia meningosepticum*, Nosocomial infection, Meningitis, Septicaemia

INTRODUCTION

Elizabethkingia meningosepticum was first reported by King in 1959 when he studied the unclassified bacteria which were associated with meningitis in infants. She named the organism that was recovered as *Flavobacterium meningosepticum*. In 1994, it was reclassified in the genus, Chryseobacterium and it was named as *Chryseobacterium meningosepticum*. In 2005, following phylogenetic studies, it was placed under the genus, Elizabethkingia [1].

It is a ubiquitous saprophytic organism which survives in chlorine-treated, municipal water supplies, colonizing sink basins and taps. It is thus a potential reservoir for infections in hospitals. The colonization of patients via contaminated medical devices, which involve respirators, intubation's tubes, mist tents, humidifiers, incubators for newborns, syringes, etc. has been documented [2]. We are reporting here a series of cases of *Elizabethkingia meningosepticum* infections in individuals with predisposing factors.

CASE REPORTS

Case 1

A 37-year-old man with stage V diabetic nephropathy came with the complaints of a decreased urine output, low grade fever, puffiness of the face and pedal oedema of one week's duration. He was an A.C technician by occupation, who was working in the Middle East. He was a diabetic and a hypertensive that was on regular treatment. He had undergone dialysis five times in the Middle East for the same complaints. E.meningosepticum was isolated from his blood after dialysis and from a second sample after 7 days. He was treated with Vancomycin 1 gm I.V. stat single dose, followed by vancomycin 500 mg once every 5 days for 4 weeks and ceftazidime 1 gm I.V. post dialysis, on alternate days, for three weeks The patient became afebrile.

Case 2

An 11 day old male came with the complaints of high grade fever and irritability since 3 days. He was a full term baby with a birth weight of 2.8 kg. He was on a ventilator. The bacteria were isolated from one blood and one CSF sample after repeated blood cultures after 3 days. He was treated with Piperacillin/Tazobactam I.V.100 mg/kg body weight every 8 hours and Ciprofloxacin I.V.10 mg/kg body weight for 14 days, followed by oral ciprofloxacin till 21 days.

Case 3

A 58-year-old P4L4 with 10 UV descent with complaints of a mass per vagina and a white discharge since 20 years of age, underwent vaginal hysterectomy and sclerotherapy. She had ischaemic heart disease with a sclerotic aortic valve. She was on treatment and was catheterized for 4 days post-operatively. The bacteria grew in dual samples of urine, with an interval of 3 days in between them. She was given Ciprofloxacin 400mg b.d. I.V. for 1 week, followed by oral Ciprofloxacin 500mg b.d. for a further 2 weeks.

MICROBIOLOGICAL WORKUP

All the samples grew yellow coloured, beta haemolytic, and gram negative bacilli after 48 hours of incubation at 37°C. The bacilli were non-motile, catalase and oxidase positive and non nitrate reducing. Glucose and mannitol were utilized oxidatively, esculin and indole were positive, gelatine was liquefied, DNA sae was negative and Arginine was dihydrolized. It did not grow at 42°C and it was resistant to Penicillin and Polymyxin B. Based on these biochemical reactions, it was identified as *Elizabethkingia meningosepticum*. The antibiotic susceptibility of the organism was obtained by the Kirby-Bauer disc diffusion method.

All the strains which were isolated were resistant to ampicillin, amoxyclav, aminoglycosides and carbapenems and they were sensitive to cotrimoxazole, ciprofloxacin, piperacillin–tazobactum, cefoperazone–sulbactum and vancomycin. Variable susceptibilities were seen for ceftriaxone and caftazidime.

In all the cases, the efforts which were made to isolate the bacteria by screening the environment were unsuccessful.

DISCUSSION

Flavobacteria are a rare cause of human disease and they are usually associated with indwelling devices or an altered immune status. *E. meningosepticum* causes neonatal meningitis with a high case-fatality rate and occasionally bacteraemia, especially in premature infants during the first 2 weeks of life [3-5]. Most of the

E. meningosepticum infections in adults are nosocomial and they affect immunocompromised hosts. The predisposing factors for the *E. meningosepticum* infection include malignancy, neutropaenia, diabetes, steroid use, malnutrition and being on dialysis [6].

It can cause a variety of infections which include endocarditis, cellulitis, wound infections, bacteraemia following burns, abdominal abscesses, dialysis-associated peritonitis, and endophthalmitis [2,5].

Although 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, and contaminated syringes in an ice chest, vials, flush solutions for arterial catheters, pressure transducers, and antiseptic solutions. It has also been found in bottles of the solutions which are stored for cleansing silver nitrate from the eyes of newborns. Bruun *et al*., [7] reported the primary colonization of the respiratory tract in ventilated patients, but this was not the exact source of the infection. A person-to-person spread is unusual with this pathogen, as was manifested by the low rates of infection among the neonates who were housed in adjacent bassinets.

To prevent an infection, an attempt should be made to trace the source of the infection and stringent steps should be implemented to prevent the transmission of this infection. The attempts which we made to trace the source of the infection in all the three cases were unsuccessful, as the environmental screening which was carried out yielded negative results. Patient one must have contracted the infection in the Middle East where he had undergone dialysis previously. Patient two was delivered in a private nursing home and hence, our screening was limited. No other patients in the ward developed infections through the same bacteria during the course.

Elizabethkingia meningosepticum has a peculiar antibiotic profile. The bacteria is inherently resistant to most of the antibiotics which are prescribed to treat gram negative bacteria, like amino glycosides, β-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). Hence, the appropriate choice of the antibiotic for the treatment 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 [6]. Though Vancomycin was used earlier to treat the patients, there were reports which showed the failure of this drug. Drugs like monocyclic, trimethoprim-sulphamethoxazole and rifampicin may be good alternatives [2,5].

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 immunocompromised adults or premature neonates and when the patient does not respond to the empirical treatment. A failure in considering this unusual pathogen in the differential diagnosis may lead to an incomplete antibiotic coverage, with the consequences being high rates of morbidity and mortality.

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