

Elizabethkingia meningoseptica Infections: A Case Series from a Tertiary Hospital in South Tamil Nadu

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ABSTRACT

Elizabethkingia meningoseptica is an opportunistic pathogen increasingly reported as hospital-acquired infection. Here, we report a series of cases of eight patients with invasive *E. meningoseptica* infections over a period of 27 months in a tertiary teaching hospital from South India. Age range was 45 days to 84 years, median 66 years, with male preponderance. Associated risk factors included recent hospitalization with surgeries, diabetes mellitus, renal failure, mechanically ventilated, and central line. All isolates were susceptible to minocycline. Combination therapy with ciprofloxacin and piperacillin tazobactam was most common. Six recovered and two patients were lost to follow-up.

Keywords: *Elizabethkingia meningoseptica*, Empirical antibiotic therapy, Intensive care unit.

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INTRODUCTION

Despite ubiquitous presence in hospital environment, *E. meningoseptica* is overlooked or misidentified as pseudomonas-like organisms in laboratories without trained microbiologists and automated identification system. Prolonged hospitalization, broad spectrum antibiotics, and central line catheter are some of the significant risk factors. In this report, we describe case series of eight invasive *E. meningoseptica* infections between January 2019 to March 2021 in a tertiary teaching hospital from South Tamil Nadu.

CASE DESCRIPTION

Patients' Characteristics

During the study period, eight patients were identified. Table 1 shows the demographic details, risk factors, and clinical outcome of these patients. Age range was 45 days to 84 years. Associated risk factors included the recent hospitalization with surgeries (5/8) diabetes mellitus (5/8), renal failure (4/8), mechanically ventilation (5/8), and central line (1/8). A case of extreme preterm twin baby with prolonged intensive care unit (ICU) stay had prior blood cultures at different time periods growing multidrug organisms including carbapenem-resistant *Escherichia coli*, *A. baumannii* (sensitive only to colistin) and *Sphingomonas paucimobilis*. Median days of ICU stay prior to bacteremia was 9.5 days (range: 6–48 days). Six acquired infection in the ICU, and two from the hospital ward and dialysis unit each. Cases were reported sporadically without clusters of infection.

Antimicrobial Susceptibility

All isolates were susceptible to minocycline, and varied susceptibility to piperacillin tazobactam (25%) trimethoprim/sulfamethoxazole (37%), and fluoroquinolones (ciprofloxacin 50%, levofloxacin 50%).

Therapeutic Regimens and Outcome

Most commonly, the combination therapy with ciprofloxacin and piperacillin tazobactam was used.

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Mortality and Morbidity

Six survived, five of whom achieved microbiological clearance. Two patients were lost to follow-up.

DISCUSSION

Main finding in the study is prior surgical procedure followed by empirical antibiotic therapy was a major predisposing factor for this infection. Intensive care unit stay, medical devices such as central line and ventilator along comorbid conditions such as diabetes mellitus and renal disorder were also potential risk factors. There was no remarkable change in the antimicrobiological susceptibility over 2.5-year period with good susceptibility to minocycline and ciprofloxacin unlike other studies from India.^{1,2}

The above findings implicate that strict infection control measures to be followed rigorously in ICUs and other high-risk areas. Bundle care implementation and audit to be performed in patients on devices. In addition, hospitals should have a properly defined antibiotic stewardship programme with implementation of antibiotic policy followed by periodic antibiotic prescription audit.

Despite the steadily increasing infection in the recent times with a worldwide geographical distribution, it is highly unfortunate

Table 1: Clinical characteristics of the patients

	1	2	3	4	5	6	7	8
Age	79	40	64	75	1	68	22	84
Gender	M	M	M	F	M	M	M	M
Culture positive	November 2018	December 2018	January 2019	July 2019	September 2019	December 2019	January 2021	February 2021
Diagnosis	Metabolic encephalopathy	Acute cerebrovascular accident with left hemiparesis	Right foot first metatarsal osteomyelitis/triple vessel disease/bilateral pleural effusion	Acute pulmonary thromboembolism/pneumonitis	Extreme preterm baby	Diabetic foot ulcer with cellulitis	CAPD peritonitis	Large bowel obstruction with sigmoid volvulus, chronic kidney disease/septic shock
Recent hospitalization and procedures	Yes, below knee amputation done 2 weeks back	Right frontotemporoparietal decompressive craniectomy and tracheostomy done a week back	Wound debridement and removal of remnant bone done a week back	Laparoscopy assisted vaginal hysterectomy with bilateral salpingo oophorectomy done a week back		Left below knee amputation		Emergency laparotomy with sigmoid colon resection and descending colostomy done 2 weeks back and Blood culture, Klebsiella pneumoniae (CRE) Surgical ICU
ICU stay	Specialty ICU	Neurology ICU	Specialty stepdown ICU	No, Medical ward	Neonatal ICU	Respiratory ICU	No, Surgery ward	
Duration of hospitalization	10 days	40 days	25 days	2 days	102 days	26 days	14 days	41 days
Diabetes	Yes	Yes	Yes	No	No	Yes	Yes	No
Mechanical ventilation	No	Yes	No	No	Yes	Yes	Yes	Yes
Central line	No	Yes	No	No	Yes	Yes	No	Yes
Number of ICU days prior to bacteremia	6	9	10 days	No	48 days	22 days	No	21
Renal failure	No	No	Yes	No	No	Yes	Yes	Yes
Treatment	Ciprofloxacin	Meropenem, piptaz	Piptaz, ciprofloxacin	Meropenem, levofloxacin	Piptaz, meropenem	Ciprofloxacin, cotrimoxazole	Intraperitoneal ciprofloxacin for	Piptaz, meropenem
Duration of therapy	9 days	9 days	8 days	5 days	10 days	7 days	14 days	8 days
Microbiological clearance	Yes	Yes	No	Yes	Yes	No	Yes	No
Outcome	Survived	Survived	AMA	Survived	Survived	AMA	Survived	Died

AMA, against medical advice; CAPD, continuous ambulatory peritoneal dialysis; CRE, carbapenem-resistant enterobacteriaceae

that many clinicians are still unaware of this organism. In India, most of the case reports and series are from few large medical centers with well-equipped laboratories.²⁻⁴

Notable limitations include retrospective design of the study, with few cases. Vitek 2 System with limited *Elizabethkingia* species in its database has poor concordance of species identification in comparison with 16S ribosomal RNA sequencing, only 24.5–26.5%.⁵ Also as reported by Lau et al., almost all *E. anophelis* species were misidentified as *E. meningoseptica* by Vitek 2.⁶ The species identification was not confirmed by 16SrRNA sequencing in the study.

HIGHLIGHTS

Prior surgical procedure followed by empirical antibiotic therapy was a major predisposing factor for this infection. There was no remarkable change in the antimicrobiological susceptibility over 2.5-year period with good susceptibility to minocycline and ciprofloxacin.

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