

ABSTRACT

Literature Review of *Brevibacillus laterosporus* and Related Species

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INTRODUCTION

Brevibacillus laterosporus is a gram-positive aerobic bacillus that is rarely associated with human infection. A review of multiple online databases revealed fewer than ten total reports of infection by this genus of bacteria. Historically, this “canoe-shaped” microbe has been characterized as a pathogen in invertebrates and information regarding human infection is scarce.

CASE

We present the first reported clinical vignette of *B. laterosporus* bacteremia in an adult human subject. A 35-year-old black female with a medical history of atypical hemolytic uremic syndrome (aHUS) on chronic hemodialysis was brought to the emergency department (ED) following her routine eculizumab infusion. During her infusion, she reported experiencing vomiting and rigors. At presentation to the ED, she was hypertensive, tachycardic, tachypneic, and febrile. Laboratory studies were significant for a procalcitonin of 1.89 µg/L. Blood cultures from her tunneled central venous catheter and from the periphery were obtained and grew *B. laterosporus*.

Due to the rarity of the organism, no established breakpoints were found following extensive literature review. Clinicians reviewed case reports of prior human infections by *B. laterosporus* to guide antibiotic therapy. Based on a review of the limited literature regarding this organism, gentamicin was used. Repeat blood cultures were negative for growth. Interventional radiology removed the tunneled central venous catheter and subsequent culture of the catheter tip yielded no growth. The patient improved and remained asymptomatic until discharge. She is doing well with no recurrent *B. laterosporus* infections 12 months since discharge.

DISCUSSION

Two published case reports of human infection by *B. laterosporus* were found. Due to the paucity of literature regarding this bacterium, cases of infection by *Brevibacillus agri* and *Brevibacillus brevis* were also reviewed.

A case of *B. laterosporus* bacteremia in a pediatric patient was successfully treated with intravenous gentamicin. This patient had a triple lumen central venous catheter. Additionally, a case of *B. laterosporus*

endophthalmitis after penetrating orbital trauma was reviewed. This individual was treated with intravenous gentamicin, however enucleation of the eye was ultimately required. Gentamicin has poor penetration into the vitreous humor. A single case of *B. brevis* spontaneous bacterial peritonitis was reviewed. A patient with cirrhosis underwent paracentesis and culture of the ascitic fluid revealed *B. brevis* growth. The patient was discharged on ciprofloxacin by mouth. She returned the following week and repeat cultures of ascitic fluid collected during repeat paracentesis again grew *B. brevis*. She was ultimately successfully treated with ceftriaxone and vancomycin. *B. agri* was found to cause pyelonephritis in a young female with diabetes mellitus. Antibiotic selection was not included in this case report.

This literature review revealed that *Brevibacillus* species appear to be opportunistic pathogens in immunocompromised individuals and/or those who possess a central venous catheter. Given that no established break points have been reported in the literature, it is difficult to interpret sensitivity data. Consultation with an Infectious Disease expert is likely warranted in all cases of *Brevibacillus* infection.

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