CASE REPORT

A rare case of *Shewanella putrefaciens* bacteremia in a patient of road traffic accident

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ABSTRACT

Shewanella putrefaciens rarely causes human infection. These are mostly found in environment and food stuffs. *Shewanella* are often found in mixed culture. It has been implicated in cellulitis, otitis media, and septicemia. It may be found in respiratory tract, urine, feces, and pleural fluid. There is no definite guideline for therapeutic option. In general, these are susceptible to various antimicrobial agents but are often resistant to penicillin and cephalothin. We report a rare case of bacteremia by *S. putrefaciens* in a patient of head injury with polytrauma after a road traffic accident.

KEY WORDS: Road traffic accident, *Shewanella algae*, *Shewanella putrefaciens*

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INTRODUCTION

Shewanella putrefaciens is a Gram-negative bacterium. It has been isolated from marine environments as well as anaerobic sandstone in the Morrison formation in New Mexico.[1]

Although it is very rare for it to act as a human pathogen, there have been cases of infections and bacteremia caused by *S. putrefaciens*.[2] Much of the problem in prevention comes from tendency of *Shewanella* to become a contaminant or saprophyte, meaning, it is often living among other bacterial infections on previously damaged organs, as well as the bacteria's ability to survive at extreme low temperatures and respiratory diversity.[3] Very few case reports of *S. putrefaciens* bacteremia have been reported from India. We report a rare case of bacteremia by *S. putrefaciens* in a patient of head injury with polytrauma after a road traffic accident.

CASE REPORT

A 24-year-old male patient with head injury with polytrauma was admitted in our hospital following road traffic accident. His Glasgow Coma Scale was poor at the time of admission with computerized tomographic scan of brain showing multiple contusions. He had bilateral clavicle fracture, left ulna fracture, and radius fracture. Maxillofacial bones were also fractured. The patient was intubated immediately and put on ventilator support and treatment started. Intravenous piperacillin/tazobactam and intravenous gentamycin were started for broad-spectrum bacterial coverage. Intravenous phenytoin and fluids were also started. His blood, urine, and endotracheal aspirate sample came to our laboratory for culture and sensitivity. Urine and endotracheal aspirate were sterile on culture. Blood culture by BacT/ALERT 3D® system (bioMerieux Inc., 100 Rodolphe Street, Durham, NC, USA) was done. Hematological investigations revealed white cell count of 14.5 □ 10^9/L and hemoglobin level of 13.0 g/dL. Blood urea was 39 mg/dL, and blood sugar was 77 mg/dL. Serum electrolytes were sodium 140 mEq/L, potassium 4.4 mmol/L, and calcium 7.3 mg/dL.

Blood culture showed convex, circular, brown tan colored colonies on blood agar plate [Figure 1]. On MacConkey agar plate, pale colonies were obtained. Gram stain showed Gram-negative bacilli. The organism was positive for motility test, oxidase reaction, and produced hydrogen sulfide in butt of Triple sugar agar. Nitrate was reduced to nitrite, and ornithine was decarboxylated. The isolate was identified as *Shewanella* by standard bacteriological techniques. Identification was confirmed by VITEK® 2 system (bioMerieux Inc.,

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Figure 1: Growth on blood agar

100 Rodolphe Street, Durham, NC, USA) as *S. putrefaciens*. Antibiotic susceptibility was done by Kirby–Bauer method. The isolate was susceptible to all common antibiotics used for Gram-negative coverage used according to Clinical and Laboratory Standards Institute guidelines.

The patient was not saved despite our best efforts. He had polytrauma along with head injury. He was not weaned from ventilator and was declared dead 15 days after admission.

DISCUSSION

S. putrefaciens is a Gram-negative, nonfermentative, oxidase-positive, motile bacillus that produces hydrogen sulfide. It is found widely in the nature especially in marine environments. In some very rare cases, *S. putrefaciens* can be a human pathogen. It can produce a wide variety of clinical syndromes including bacteremia as well as skin and soft tissue infections.[4] The infection from *S. putrefaciens* most commonly involves skin and soft tissue associated with damage to skin (trauma, cut, ulcer) and otitis media. Primary bacteremia with fulminant course is also seen in immunocompromised patients. *S. putrefaciens* does not commonly cause lower respiratory tract infection. Respiratory colonization with the possibility of infection has been identified in rare cases from isolates cultured from sputum and pleura and transthoracic needle aspiration cultures.[5]

Both *S. putrefaciens* and *Shewanella algae* are uncommon isolates from clinical subjects, their natural habitats being all form of water, fish, oily food stuffs, and soils.[6-8]

CDC recognizes two biotypes of *S. putrefaciens* based on the requirement of sodium chloride for growth, oxidation of sucrose and maltose, and the ability to grow on *Salmonella* Shigella agar. Khashe and Janda have reported that *S. algae* is the predominant human clinical isolate while *S. putrefaciens* (CDC biotype 1) represents majority of nonclinical isolates.[9]

Nevertheless, *S. putrefaciens* also retains pathogenic potential, mainly under special environmental circumstances. Indeed, most of the reported infections are associated to contact with contaminated waters or injuries or occurrences in which integrity of the skin was compromised to some extent.[7,10] In our case also, this might be source of infection. Potential incriminating agents are also long-term catheters. In addition, isolation of *S. putrefaciens* occurred in polymicrobial infections,[10] but in our case, it was the single pathogen isolated from blood culture.

CONCLUSION

Although *Shewanella* is generally susceptible to antimicrobial agents, early diagnosis and prompt treatment can reduce morbidity and mortality among immunocompromised patients. Hence, a high level of suspicion is necessary. We conclude that these pathogens should not be considered as laboratory contaminants and should not be discarded as such.

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Conflicts of interest

There are no conflicts of interest.

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