

Shewanella Putrefaciens - A Rare Cause of Bacteremia in Patient of Chronic Renal Failure on Maintenance Hemodialysis

(A Case Report)

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Abstract: We report a case of bacteremia due to *Shewanella putrefaciens* in 58yr old female patient who presented with high grade fever to hospital. She was on maintainace hemodialysis (HD) suffering from chronic renal failure. Blood culture from central and peripheral line was sent from which *Shewanella putrefaciens* was isolated which was resistance to most of commonly used antibiotic. Patient was started on imipenem as per result of antibiotic susceptibility pattern. She was recovered after five days of therapy and repeat blood culture was negative thereafter. *Shewanella putrefaciens* is resistance to routinely used antibiotic which make its identification and susceptibility essential.

Keywords: *Shewanella putrefaciens*, blood culture, maintainace hemodialysis.

I. INTRODUCTION

Shewanella spp. Are widely distributed in nature, and their natural habitats are water and soil. ^[1] *Shewanella putrefaciens* is an uncommon cause of human disease, and isolates from clinical specimens usually indicate colonization. On the other hand, several reports have demonstrated the association of this organism with otitis media, infected ulcers of the lower limbs, and systemic infections in patients with severe debility, liver disease, or malignancy. ^[2]

Shewanella putrefaciens is rarely responsible for clinical syndromes or bacteremia, ^[3,4] but it is a potential pathogen for patients with immunocompromised conditions. ^[3,5] Since *S. putrefaciens* was first isolated from humans by Kingin 1964, ^[6] the number of case reports describing this organism as a human pathogen has increased in recent years. However, most human isolates of *S. putrefaciens* occur as part of a mixed bacterial flora, which may overshadow the clinical significance of infections caused by this organism. Here, we are reporting a case of bacteremia due to *Shewanella putrefaciens* in patient of chronic renal failure and was on maintainace hemodialysis (HD) with permanent catheter.

II. CASE REPORT

A 58yr old female patient had been receiving maintainace HD via right internal jugular tunneled catheter having chronic renal failure since last 3 months. She presented to hospital this time with high grade fever and general fatigue. On admission all routine investigations were sent along with blood culture from both peripheral vessels and intrapermanent catheter were sent ^[7] as per standard protocol to laboratory. Patient was started on empirical antibiotic to which she didn't responded. The patient denied having been exposed to any fresh or salt water, insect bite or trauma or having traveled recently. On examination she was febrile and general fatigue was observed. Physical examination demonstrated no specific signs of infections or skin manifestations. Routine hematological investigation showed increased total leucocytes count. Blood cultures sent to microbiology lab indicated growth after 72 hr in BACTEC BD 9120. Bacteriological work up was done wherein direct smear from both peripheral vessels and intrapermanent catheter blood culture bottle showed pleomorphic gram negative bacilli. Subsequently subculture was done on 5% Sheep Blood Agar (SBA) (figure-1) and

MacConkey agar (figure-2). After 24 hr of incubation pure growth was obtained on 5% SBA and MacConkey agar which was identified on phoenix ver.6.01 as *Shewanella putrefaciens* which was confirmed by additional biochemical and bacteriological tests as recent changes in taxonomy have suggested that several strains of previously reported *Shewanella putrefaciens* probably were *S.alga*. Antibiotic susceptibility pattern showed resistance to ampicillin-sulbactam, cefaclor, gentamycin, cephalothin and sensitivity to amikacin, cefoperazone-sulbactam, colistin, imipenem. Depending on antibiotic susceptibility testing (AST) report, patient was started on imipenem. Patient was recovered after five days of start of therapy and repeat blood culture was negative thereafter.

As there are very few reports of *Shewanella putrefaciens* bacteremia and there is resistance to routinely antibiotic which make its identification and susceptibility essential.

III. FIGURES WITH LEGENDS



Figure 1- Colonies of *Shewanella putrefaciens* on 5% SBA



Figure 2- Colonies of *Shewanella putrefaciens* on MacConkey agar



Figure 3 – H₂S produced by *Shewanella putrefaciens* on Triple Sugar Iron Agar

IV. DISCUSSION

S.putrefaciens is a nonfermentative Gram-negative facultative rod that produces hydrogen sulfide and reduces iron metabolically (figure-3). [3, 5, 8] It is a ubiquitous saprophyte and can be isolated from the marine environment, contaminated water, and food. [3, 5] *S. putrefaciens* was initially classified as a *Pseudomonas* sp., and it has become a pathogen for clinical infections in recent years. [9, 10]

Recently Wu et al^[8] reported that a comparison between patients under hemodialysis with community-onset bacteremia caused by community and health care associated methicillin-resistant *Staphylococcus aureus* strains. Despite *Staphylococcus* spp. being the most common pathogen of catheter-related bacteremia in patients receiving hemodialysis for end-stage renal disease,^[8] the nonfermentative Gram-negative bacilli also play an important role.

The risk factors of *S. putrefaciens* infections include malignancy, chronic renal failure, and immunosuppressed patients.^[9] The clinical outcome is often benign, except in rare uremic patients,^[10] which may be due to immunologic dysregulations, poor nutrition, iron overload, or hemodialysis. Our patient also had a permanent catheter in situ for hemodialysis, which was associated with bloodstream infection. Liu et al^[10] reported that the increasing catheter-related infection rate was associated with a poor compliance of the care bundle, because most cases were due to inadequate barrier precautions and inappropriate hand hygiene.^[10] Out of more than 30 already known *Shewanella* species, only *S. putrefaciens* and *S. algae* are considered pathogenic for humans.^[11]

S. putrefaciens is often resistant to penicillin, and first- and second-generation cephalosporins, but susceptible to 3rd- and 4th-generation cephalosporins, carbapenem, and aminoglycosides as shown by some studies^[9] which are very similar to our study. As *S. putrefaciens* is resistance to most commonly used antibiotic hence necessary to perform AST specifically in high risk group.

V. CONCLUSION

Clinicians should perform bundle-care for decreasing catheter-related infection, and be aware that *S. putrefaciens* can probably be regarded as an emerging opportunistic pathogen in patients receiving hemodialysis.

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