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Case Report

Aeromonas sobria cellulitis with septic shock - rare but potentially lethal in chronic liver disease

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ABSTRACT

Aeromonas, a common bacterial resident of freshwater is known to cause gastrointestinal illness in humans. Contaminated water and aquatic foods are the usual sources. Gastrointestinal disease is usually mild in normal individuals and responds to common antibiotics. However, extra-intestinal infections by *Aeromonas* species have been increasingly reported. Severe skin and soft tissue infection followed by septic shock may be seen in immunocompromised individuals. Bacteremia can also occur secondary to invasive gastroenteritis in persons with impaired immunity. Patients with decompensated chronic liver disease have been noted to be at especially high risk for fatal infection due to this pathogen. It can cause early bacteremia and rapid death without surgical debridement. We report a case of fatal *Aeromonas cellulitis* with septic shock in a patient with known advanced alcoholic liver disease. It started following minor skin injury and subsequent exposure to pond water. The patient presented late with septic shock and succumbed to his illness.

Keywords: *Aeromonas*, Cellulitis, Septic shock, Cirrhosis of liver

INTRODUCTION

Cirrhosis of the liver is considered to be one of the most common forms of acquired immunodeficiency. It greatly increases the risk for bacterial and other opportunistic infections. Cirrhotic patients have hypoalbuminemia which may give rise to gut translocation of endogenous flora. Gastrointestinal bleeding, which is a common complication of cirrhosis is another independent risk factor for infection. Up to 25% of deaths in cirrhotic patients are estimated to be due to bacterial infection.[1]

Aeromonas is a gram-negative bacillus widely prevalent in aquatic environments. In humans, they are commonly associated with gastrointestinal illness; however, they have also been identified as a causative agent of cellulitis and soft-tissue infections as well as septicemia in both immunocompetent and immunocompromised hosts.[2] Septicemia due to *Aeromonas* is relatively uncommon, occurring in only about 3% of individuals infected with the bacteria in one study, and this most commonly happens when infections are caused by *A. hydrophila* as opposed to other aeromonads.[2-4]

CASE REPORT

A forty-seven-year-old male presented to casualty with a history of high spiking fever for 5 days. He also developed bipedal swelling with fluid-filled blisters over both his lower limbs (Figure 1) for the same duration. It started as an erythematous indurated patch over the right lower limb which is followed by blister formation. He is diagnosed to be a case of alcoholic decompensated liver disease for last one year. He had an exposure to burnt ashes over both legs a few days back in his household following which he washed the legs in pond water. All his symptoms started following this event.

Figure 1: Right lower limb showing extensive blisters and cellulitis.

At the time of presentation, his blood pressure was unrecordable with a falling Glassgow coma score. He was started on dual inotropes in casualty @ 30 mics of noradrenaline and @ 1.2 mg of vasopressin to maintain a mean arterial pressure of 65 mm of hg. Baseline blood tests revealed a total WBC count of 16,800 with 82% neutrophils. Serum sodium 125 mmol/lt and potassium 4.9 mmol/lt, urea-37% and creatinine 2.3 mg%. Serum procalcitonin was 11.31 ng/ml. Clinically he had moderate ascites and ascitic fluid was analyzed and found to have 75 cells/cu mm with 82% polymorphs. Biochemistry revealed high SAAG and low protein. Both blood and ascitic fluid cultures were sent and he was started on renal dose-adjusted injection meropenem. He was shifted to ICU and his clinical condition progressively worsened. Even with dual inotropes BP was not maintained and he required dobutamine as 3rd inotrope. Renal functions worsened with progressive worsening of creatinine. The ascitic fluid culture was negative and the blood culture flagged positive at 5.02 hours and MALDI-TOF confirmed it as *Aeromonas sobria* which was susceptible to 3rd generation cephalosporins (Table 1). His antibiotic was deescalated from meropenem to cefotaxime. The blisters and cellulitis over his lower limbs worsened and he developed refractory septic shock in the next 48 hours and died.

Table 1: Blood culture - *Aeromonas* at 5.02 hours and MALDI-TOF confirmed *Aeromonas sobria*.

Antibiotics	MIC	Susceptibility
Cefotaxime	<2	Susceptible
Meropenem	<1	Susceptible
Co-trimoxazole	<2/38	Susceptible
Ampicillin	>16	Resistant
Tetracycline	<4	Susceptible
Ciprofloxacin	<1	Susceptible

DISCUSSION

Aeromonas can cause soft-tissue infections apart from the usual gastrointestinal disease. Patients with cirrhosis of liver have an increased risk of bacteremia and sepsis due to *Aeromonas*.[1] As bacterial infections are a significant cause of death in patients with liver cirrhosis, it is important to be aware of the pathogens that pose a particular threat to these patients. *Aeromonas* is a potential pathogen in those with underlying decompensated cirrhosis with a history of injury or exposure related to pond or lake water. *Aeromonas* species produce beta-lactamases and generally show resistance to penicillin, ampicillin, amoxicillin-clavulanate, and first and second-generation cephalosporins[1,2] Cirrhotic patients presenting with soft tissue infection with water exposure and septic shock should receive empiric antibiotic therapy covering both *Aeromonas* and *Vibrio spp*.

Third-generation cephalosporins, fluoroquinolones, and trimethoprim-sulfamethoxazole have been shown to be the most effective and should thus be considered.[2] Detailed history in patients with skin and soft tissue infections should be carefully noted. The presence of injury in freshwater aquatic environments should elicit high clinical suspicion for *Aeromonas* infection and subsequent empiric antibiotic choice. Blood cultures are required because these patients are at greater risk for bacteremia and more severe illness. In our case, we sent blood culture directly from casualty before starting antibiotics that grew *Aeromonas sobria* in only 5 hours. This organism is classified as *Aeromonas veronii biovar sobria.* It is an extremely uncommon species of aeromonas causing soft tissue infection and septic shock. The usual species implicated in this context of advanced liver disease is *A. hydrophila*.[5,6] Our patient presented in an advanced stage with septic shock and extensive cellulitis. Early diagnosis particularly in those with chronic liver disease is essential as they are prone to develop severe shock due to diminished immunity. In chronic liver disease hepatorenal syndrome, coagulopathy further complicates the situation and mortality and also influences the surgical plan like our case. Delay in therapy leads to increased mortality in this apparently benign infection.

CONCLUSION

Thorough history along with local epidemiology is very important in skin and soft tissue infection. For immunocompromised patients e.g. chronic liver disease presenting with skin and soft tissue infection; taking a detailed history is especially important to expand clinical suspicion of potential microbiological aetiologies apart from gram-positive cocci. This may lead to early treatment and a significantly reduced rate of morbidity and mortality in these high-risk groups.

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