Clostridium sp. as a cause of Endocarditis in a patient with liver Cirrhosis

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Abstract

We report the case of a patient with liver cirrhosis admitted with fever and diarrhea, with a positive blood culture for Clostridium sp. and positive result for fecal glutamate desidrogenase, with cardiac valve vegetation and presumptive diagnosis of endocarditis that was successfully treated with vancomycin.

INTRODUCTION

Due to a hyperinflammatory state at the clinical and molecular level and profound immunoparesis, patients with decompensated cirrhosis are at risk of developing bacterial infections which frequently result in hospitalization1. The most common infections in cirrhosis are spontaneous bacterial peritonitis, urinary tract infection, pneumonia, spontaneous bacteremia, skin and soft tissue infection2. Clostridium difficile infection is also a prevalent type of infection in cirrhosis and hurts the prognosis of patients. The Clostridium species is a gram positive, anaerobic, rod-shaped microbe. Most infections by the Clostridium species involve Clostridium difficile, Clostridium botulinum, and Clostridium perfringens3. Clostridium difficile exotoxins (TcdA and TcdB) induce colitis in susceptible individuals4. Spectrum of disease ranges from mild diarrhea to severe and complicated colitis, including pseudomembranous colitis, toxic megacolon and death5. We report a case of Clostridium sp. presumptive endocarditis in a cirrhotic patient successfully treated with vancomycin.

CASE REPORT

A 48-year-old male was admitted to the emergency room with abdominal pain and chills. The patient presented previous diagnose of liver cirrhosis of alcoholic etiology, and two previous hospitalizations for upper digestive bleeding and ascites decompensation. His treatment comprised furosemide 40mg/day, spironolactone 50mg/day, carvedilol 6.25mg twice a day, omeprazole 20mg/day and rubber band ligation of esophageal varices. Patients was classified as Child-Pugh C, and presented Meld Na = 22. Diagnostic paracentesis was performed with diagnosis of spontaneous bacterial peritonitis with neutrophilic ascitis and ascitic fluid’s culture positive for Streptococcus anginous, sensitive to ceftriaxone treated initially with ceftriaxone and after 48 hours with piperacillin-tazobactam as ascitic fluid high cellularity had not dropped compared to the initial one. was started. In control examination of the ascitic fluid, persistence of high cellularity was noted, without expressive drop. After another 48 hours meropenem was started as neutrophils count were still high, and the patient presented clinical and laboratory improvement of the SBP picture.

After 12 days of hospitalization patient presented an acute episode of fever and profuse watery diarrhea. A stool sample was negative for Clostridium difficile toxins and positive for glutamate desidrogenase. Hemoculture was
positive for Clostridium sp. in a single sample of blood culture. Requested transthoracic echocardiogram that showed valve thickening aortic artery, without valve dysfunction, with a small moving image on its low-pressure ventricular face echogenicity that could correspond to small vegetation. Although suggestive, the reported condition does not meet Duke criteria for the definitive diagnosis of infective endocarditis, but the treatment was started with intravenous vancomycin for up to 4 weeks after negative blood culture. There was complete improvement of the condition, without cardiac complications or other organic dysfunctions.

**DISCUSSION**

Age > 65 years, multiple hospitalizations, inpatient stays >20 days, hypoproteinemia, Clostridium difficile colonization, hepatic encephalopathy, antibiotic, and proton pump inhibitors use are associated with the development of Clostridium difficile infection in patients with cirrhosis.

Our patient presented many of these risk factors, namely: history of multiple hospitalizations, hypoproteinemia, probable Clostridium difficile infection, large spectrum antibiotics and proton pump inhibitor use.

Clostridium difficile infection is associated with an increased mortality, driven by acute kidney injury, and therefore, requires aggressive identification and therapy. Alongside increased mortality, Clostridium difficile infection potentially carries additional risk of complications, including sepsis, organ failure, portal vein thrombosis, and readmission.

Our patient presented with fever and diarrhea. As a result of the impaired immune response, most patients with decompensated cirrhosis are unable to mount a febrile response. Extra-intestinal Clostridium difficile infections rarely present with fever. About 0.12% of positive blood cultures are due to Clostridium species, and the most common species isolated is Clostridium perfringens followed by Clostridium septicum.

As our patient had positive result for fecal glutamate desidrogenase in the stool, we could assume that Clostridium sp. from the blood culture could be Clostridium difficile, but it could also be a different species as TcdA and TcdB were not detected in feces and there are reports of infection by more than one type of Clostridium in the same patient. Clostridial bacteremia is frequently a marker for the clinician to evaluate for an underlying illness and source and to decide, in addition to whether to initiate antibiotic therapy directed against Enterobacteriaceae and anaerobes. As a small vegetation was detected on echocardiogram, vancomycin was introduced to treat infectious endocarditis, despite Dukes criteria were not fulfilled.

**Endocarditis caused by anaerobes is uncommon.** Although stated in the older literature that these are responsible for 2 to 10% of all cases of endocarditis, the largest published series failed to report any case series. Among all anaerobes, endocarditis due to Clostridia spp. is exceedingly rare. Preexisting valve disease, including prosthetic valves and rheumatic heart disease, is reported in 50% of patients.

Clostridium endocarditis has rarely been reported in literature. Chaudhry et al. reported a case of Clostridium difficile intracardiac vegetation in a 11-year-old girl with a predisposed heart disease. Chaudhry et al. reported a case of infective endocarditis due to Clostridium sordellii from a female patient with ventricular septal defect. Barnes et al. report a case of a patient with documented valvular heart disease in whom an empyema and infective endocarditis developed due to Clostridium sordellii. Alvarez-Ellero and Sifuentes-Osorio reported a case of a patient with two prosthetic valves had clinical evidence of infectious endocarditis caused by Clostridium perfringens. The diagnosis was made by routine examination of the peripheral blood smear. Watanakunakorn et al. reported a case of Clostridium innocuum endocarditis. The fatal case involved the tricuspid and pulmonary valves and was associated with multiple pulmonary emboli. Kolander et al. reported a case of Clostridium bifermantens endocarditis occurred in a 23-year-old man who was an intravenous drug user. There was no history of preexisting valvular heart disease. Gordon e Axelrod report a case of a patient with a combined infection due to Pseudallescheria boydii and Clostridium limosum on a prosthetic dura mater aortic valve homograft. While this patient had Clostridium limosum only growing in blood cultures, both organisms were isolated from the surgically resected aortic valve.

In conclusion, Clostridium species endocarditis is a rare entity that usually occurs in patients with previously heart disease. In the presence of Clostridium bacteremia, endocarditis must be considered as differential diagnosis as assertive treatment may improve survival.

**References**

6. Durack DT, Lukes AS, Bright DK. New criteria for diagnosis of infective


