

CASE REPORT

Listeria monocytogenes PERITONITIS IN CIRRHOTIC PATIENTS: FIRST DESCRIPTION IN BRAZIL

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SUMMARY

Two cases of spontaneous bacterial peritonitis (SBP) caused by *Listeria monocytogenes* in cirrhotic patients are reported. In one of the cases, the microorganism was isolated from pleural effusion and ascites. SBP is a serious and common complication of patients with ascites caused by hepatic cirrhosis and the culture of the ascitic fluid is an important tool for the diagnosis and for the more appropriate treatment. Although a third generation cephalosporin has usually been employed for empiric treatment of SBP, it does not provide adequate coverage against *Listeria* spp. In such cases the use of ampicillin (with or without sulbactam) or sulfamethoxazole-trimethoprim is recommended. The last one is used for secondary prophylaxis, instead of norfloxacin.

To summarize, *Listeria monocytogenes* infection is a rare cause of SBP, whose treatment should be specific for the bacteria.

KEYWORDS: *Listeria monocytogenes*; Spontaneous bacterial peritonitis; Cirrhosis; Pleural effusion.

INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is a common and severe complication of patients with ascites caused by hepatic cirrhosis⁵. The mortality rate is 20-40%, similar to the occurrence of variceal bleeding⁷. Gram-negative members of the Enterobacteriaceae family and *Streptococcus* spp. are the most common organisms isolated in the ascitic fluid. SBP caused by *Listeria* spp. is a very rare infection.

Listeria monocytogenes is a gram-positive facultative anaerobic rod that is a well-known pathogen in the neonate, but it has been increasingly recognized as a pathogen in adults¹³. It can cause infections like meningitis, bacteremia with or without sepsis and chorioamnionitis. Conditions such as advanced age, pregnancy, malignancy, alcoholism, cirrhosis, Crohn's disease, the post-renal transplant state, the treatment with corticosteroids are associated with an increased risk of infection^{1,2,3,5,9,13}. *Listeria monocytogenes* is the main pathogenic among the seven known *Listeria* species¹⁻⁵; however rare cases of human disease caused by other species have been reported⁵.

We reported the first cases of spontaneous bacterial peritonitis caused by *Listeria* sp. in cirrhotic patients in Brazil. It is also the first case of concomitant isolation in pleural effusion.

CASES REPORT

Case 1: A 78-year-old woman with previous diagnosis of

cryptogenic cirrhosis was admitted to the hospital with abdominal pain, increased abdominal girth, fever and delirium. These symptoms were present for the last three days.

On examination the patient was ill-looking, febrile (39 °C), lethargic and drowsy. The abdomen was diffusely tender and ascites was present. Asterixis was found in neurological examination. Paracentesis was done and the ascitic fluid showed 2390 cells per mm³. Peritoneal fluid was cloudy and microscopic examination was remarkable for 2390 leukocytes/mm³, but the differential count of neutrophils had not been available. Ascitic fluid obtained by aspiration was directly inoculated into aerobic blood culture and processed by the BACTEC 9240 system (Becton Dickinson Microbiology Systems, Cockeysville, USA). Gram staining was performed and no organisms were observed. After a 72-h incubation, blood culture bottle was positive and an aliquot was plated into blood agar, chocolate agar and MacConkey agar and incubated at 35 °C in a 5% CO₂-enriched atmosphere. A catalase-positive, small gram-positive rod grew, producing narrow beta-hemolysis zone on blood agar. The motility test at 28 °C was also positive. The isolate was identified as *Listeria* sp. by Vitek System (BioMérieux, France)^{4,10}. No additional tests were performed.

Intravenous albumin was administered twice after the procedure and ceftriaxone was promptly prescribed due to suspicion of spontaneous bacterial peritonitis. Lactulose was also given to the treatment of hepatic encephalopathy.

Three days later *Listeria* sp. was detected in the culture of ascitic

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fluid and the antibiotic was substituted for ampicillin, according to the antibiotic therapy of choice for listeriosis in literature. After this change we noted a progressive improvement of her clinical condition. Secondary prophylactic therapy was maintained with sulfamethoxazole-trimethoprim.

Case 2: A 62-year-old woman with cryptogenic cirrhosis was hospitalized for investigation of ascites, massive pleural effusion in left hemithorax, weight loss and sporadic night fever of four months duration.

On admission, her vital signals are: PA 120/80 mmHg, heart rate 73 per minute and temperature 36.8 °C. Diminished breath sounds and egophony were heard in both sides of thorax, but especially on the left side. Ascites was present but there was not abdominal tenderness. The analysis of ascitic fluid showed 500 leukocytes/ μ L with predominance of polymorphonuclear neutrophils (58% of the ascitic fluid white blood cells). The thoracentesis was also performed. No organisms were seen in the Gram staining. Ascitic and pleural fluid were inoculated into aerobic and anaerobic bottle and processed in the automatized Bactec 9240 as previously described. A catalase-positive, small gram-positive rod grew, producing narrow beta-hemolysis zone on blood agar. A positive CAMP test using beta-hemolysin-producing *Staphylococcus aureus*, hydrolysis of esculin and tumbling motility test at 28 °C were also observed. The isolate was identified as *Listeria monocytogenes* by the *Vitek System* (BioMérieux, France)^{4,10}.

The cultures of ascitic and pleural fluids were positive for *Listeria monocytogenes* and treatment with parenteral sulfamethoxazole-trimethoprim was initiated. There was remission of the symptoms and secondary prophylactic therapy was initiated with the same antibiotic.

DISCUSSION

Spontaneous bacterial peritonitis (SBP) is a bacterial infection of ascitic fluid, which arises in the absence of any other source of sepsis⁷.

The diagnosis of SBP is made by diagnostic paracentesis and it has been found that the number of neutrophils within ascitic fluid is a remarkably accurate indicator of infection. The neutrophils count of ≥ 250 cells/ mm^3 is considered diagnostic for neutrocytic ascites and empiric antibiotic therapy can be initiated while awaiting results of blood and ascitic fluid cultures^{5,7}. The current gold standard for diagnosis of SBP is the isolation of a single pathogen. The most frequently isolated agents are the gram-negative rods, specially *Escherichia coli* and *Klebsiella pneumoniae*, and gram-positive cocci, such as *Streptococcus pneumoniae*^{5,7}.

In both case reports, the number of nucleated cells within ascitic fluid was ≥ 250 cells/ mm^3 and the ascites culture confirmed SBP caused by *Listeria* sp.

SBP caused by *Listeria monocytogenes* is a very rare infection. RHEINGOLD *et al.* were the first to describe spontaneous bacterial peritonitis due to *Listeria monocytogenes* in cirrhotic patients in 1977¹¹. More than 40 cases were reported later and most of them occurred in Spain^{2,5}. The reason for the great incidence in this country is unknown⁵. Cirrhosis has been related in approximately fifty percent of cases and

main etiology has been alcoholic cirrhosis². Although many authors have suggested a third-generation cephalosporin such as cefotaxime for the empiric treatment of SBP^{7,12} it does not provide adequate antibiotic coverage against *Listeria* spp. In such cases, recent reviews have suggested the use of ampicillin (with or without sulbactam) or sulfamethoxazole-trimethoprim. The use of this last antibiotic is recommended for secondary prophylaxis, instead of norfloxacin^{1,5}. Initially our patient had been treated with a third-generation cephalosporin, but the antibiotic was changed after the isolation of *Listeria*.

The optimal duration of therapy for SBP caused by *Listeria* spp. has not been determined. Factors that may determinate the duration of therapy include the resolution of neutrocytic ascites, sterilization of blood and ascitic cultures, and the presence of the organism in sheltered sites, such as the brain, joints, or an abscess¹³. The mortality rate of peritonitis caused by *Listeria monocytogenes* is high. SIVALINGAM *et al.* (1992) observed the mortality rate for the 12 cases of *Listeria* peritonitis was 25%¹³.

In the second case, the patient had pleural effusion, whose culture was also positive for *Listeria* spp. The isolation of this bacterium in pleural effusion is very uncommon. About 20 cases were reported in the literature and the third case in a patient with cirrhosis was published in 1999^{13,14}. The morphology of *Listeria* spp. can be confused with that of other gram-positive bacteria and caution should be taken to differentiate from enterococci (catalase-negative and CAMP test negative) or group B streptococci (bile-esculin negative). Because of the characteristic motility of this bacterium in semisolid agar, the motility test can also be used to differentiate it from other gram-positive bacteria. An umbrella-like pattern of growth can be seen several millimeters below the agar surface^{6,8}.

We concluded that the culture of the ascitic fluid is an important tool for the diagnosis. It is more important in special cases of less common pathogens infection. *Listeria* spp. is a pathogen that can rarely cause spontaneous bacterial peritonitis in cirrhotic patients. The current antibiotics employed for SBP treatment does not cover this agent. There is no standard antibiotic for this specific treatment. Anyway our treatment was according to other case reports and reviews.

RESUMO

Peritonite bacteriana espontânea causada por *Listeria monocytogenes* em pacientes com cirrose: primeiro relato de caso no Brasil

Foram relatados dois casos de peritonite bacteriana espontânea (PBE) por *Listeria monocytogenes* em pacientes com cirrose. Em um dos casos isolamos também o agente no líquido pleural. A PBE é uma complicação comum e grave de pacientes com ascite por cirrose e a cultura do líquido ascítico é de grande importância para o diagnóstico e para o tratamento mais adequado. Embora uma cefalosporina de terceira geração seja geralmente utilizada para o tratamento empírico da PBE, ela não oferece cobertura adequada contra a *Listeria* spp. Nesses casos, recomenda-se o uso de ampicilina (com ou sem sulbactam) ou sulfametoxazol-trimetoprim. Para a profilaxia secundária indica-se o uso deste último, ao invés da norfloxacina.

Em resumo, a infecção por *Listeria monocytogenes* é uma causa rara de PBE e o tratamento específico deve ser administrado.

ACKNOWLEDGEMENTS

The authors are thankful to Mrs. Christina Naomi Oda Bento and Mrs. Valéria Teixeira Alves Rosa of Laboratory of Microbiology of Hospital das Clínicas of S. Paulo University Medical School for the identification of the etiologic agent of this report.

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Received: 1 November 2005

Accepted: 5 May 2006