

Frequency and types of spontaneous bacterial peritonitis in cirrhosis liver due to viral hepatitis-revisited

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ABSTRACT

Introduction: Cirrhosis of the liver can often get complicated by Spontaneous Bacterial Peritonitis (SBP) that is potentially fatal and often overlooked as a cause of acute febrile condition in these patients. A high index of suspicion is warranted by physicians to effectively treat this condition.

Objectives: To determine the bacterial yield of ascitic fluid cultures in patients with cirrhosis liver with clinical suspicion of spontaneous bacterial peritonitis.

Materials & Methods: This study was conducted in the Department of Medicine, at Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar from July 2021 to June 2022. Fifty patients with liver cirrhosis suspected of having spontaneous bacterial peritonitis were included in the study. Diagnostic paracentesis was performed at the time of admission before commencing them on appropriate antibiotics. Ascitic fluid was inoculated in culture bottles, Sub cultures were performed, followed by identification of bacteria and their antibiotic sensitivity.

Results: Out of the 50 patients with mean age 48 ± 7.5 years with 27(54%) males and 23 (46%) females, 20 were HBs Ag positive, 28 for Anti HCV and two were positive for both. We observed 29 cases that had SBP. We reported 11(22%) cases of classical SBP, 16(55.17%) of Culture Negative Neutrocytic Ascites and 01(2%) from the Bactericides group. Escherichia Coli was the most common organism isolated, followed by Streptococcus.

Conclusion: SBP is a common complication of cirrhosis liver with ascites. It is easily overlooked and calls for a high index of suspicion for the diagnosis. Ascitic fluid culture along with cytology remains the ideal method to effectively diagnose SBP.

Keywords: Peritonitis; Liver Cirrhosis; Ascites; Ascitic Fluid; Hepatitis.

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INTRODUCTION

Cirrhosis of the liver is a product of chronic insult to the liver resulting in progressive fibrosis and distorted hepatic architecture.¹ Most common cause of cirrhosis in our region remains post viral hepatitis B and C viral infections in disparity to the western world where the cause is mostly alcoholic and cryptogenic.²⁻⁵ Spontaneous bacterial peritonitis (SBP) is well-recognized and frequent complication of cirrhotic liver with ascites.⁶ Caroli was the first to report the first case of SBP in 1958.⁷ The prevalence of SBP in Pakistan has been reported to be 32-64%.⁸ SBP is defined as bacterial peritonitis that happens in cirrhotic patients with ascites in the absence of any recognized intra-abdominal surgically treatable source of infection.⁹ SBP may present as sudden onset of fever with chills, diffuse abdominal pain, rebound tenderness and absent bowel sounds.¹⁰ In some patients the symptoms may be minimal and the presenting features in these patients may be jaundice, encephalopathy, or hypotension, without any localizing abdominal signs.⁶ SBP is the consequence of bacteremia due to defects in the functions of reticuloendothelial system as well as the decreased peripheral destruction of bacteria by neutrophils with secondary seeding of ascitic fluid.¹¹ Low ascitic fluid albumin and other proteins impair the opsonizing activity and thus decrease the bactericidal activity of ascitic fluid.^{12,13} In about 90% of cases the infection is monomicrobial and organisms are usually of intestinal origin.¹⁴ Aerobic Gram-negative organisms are the most commonly isolated bacteria but 25% of infections are due to Gram-positive organisms.¹⁴

The objective of this study was to document the frequency and types of SBP in cirrhosis liver and know the most causative organisms in our local population. This should help to sensitize the treating doctors in meticulously looking for this important complication in patients with cirrhosis liver and ascites.

MATERIALS & METHODS

This descriptive observational study using consecutive non-probability sampling was conducted in the Department of Medicine at Khyber Teaching Hospital (KTH) and Hayatabad

Medical Complex, Peshawar from July 01, 2021, to June 30, 2022. Formal ethical approval from the Ethics Committee of the hospitals was obtained after explanation of the study protocols, objectives, and expected outcomes. Fully informed structured written informed consent was obtained from all the included individuals or their responsible care givers.

All adult patients between 18 to 70 years of age, of either sex, whether admitted through outpatients or casualty having history of history of fever with chills, increasing confusion or coma, abdominal distension or increasing pains with or without the signs of hepatic encephalopathy and ascetic fluid routine exam showing total leukocytes counts more than 500/cmm or a Polymorph count of more than 250 cells/mm were included in the study.¹⁵ Patients with history of use of antibiotics in last 72 hours or admission in hospital, associated medical conditions like diabetes, malignancies, or immunosuppression because of any condition were excluded. Patients with documented cirrhosis liver secondary to other causes than HBV and HCV infection were also excluded. Detailed history was obtained from each patient using predesigned proforma. About 10 ml of the ascitic fluid using the bed side “Z technique” from clinically confirmed

patients was collected and immediately inoculated into a commercially available blood broth bottle (Biphasic Culture System) and sent for routine biochemical, cytological examination, Gram staining and culture and sensitivity.

The data were analyzed using SPSS version 23. Mean and standard deviation were calculated for numerical variables like TLC, Bilirubin, Prothrombin Time, Ascitic Fluid Albumin and cell counts. Frequency and percentages were estimated for categorical variables like gender and Ascitic fluid types; comparisons of frequencies were done by the Chi-square test with $p \leq 0.05$ considered significant.

RESULTS

The mean age of the included patients was 48 ± 7.5 years with 27(54%) males and 23 (46%) females. We observed that 40% were positive for HBs Ag, 56% for anti HCV antibodies and 4% were positive for both the viruses. SBP was detected in 58% cases while the rest were from the non-SBP group. The biochemical data in the patients is presented in Table 1 with data expression as mean \pm SD.

Table 1: Biochemical data in SBP and Non-SBP patients (n=50).

Variable	SBP	Non-SBP	P value
Total Leucocyte Count	10510.34 \pm 1336.39/cmm	8952.38 \pm 1136/cmm	0.0000764
ESR	55.44 \pm 16.23mm/1 st hr	43.85 \pm 5.16mm/1 st hr	0.0028
Serum Bilirubin	5.00 \pm 1.44mg/dl	3.2 \pm 1.31mg/dl	0.00004
Serum Protein	5.4 \pm 0.97gm/dl	5.68 \pm 1.21gm/dl	0.3615
Serum Albumin	2.39 \pm 0.65gm/dl	2.71 \pm 0.69gm/dl	0.1049
Ascitic Fluid Albumin	1.00 \pm 0.34gm/dl	1.51 \pm 0.52gm/dl	0.000157
Ascitic Fluid TLC	2587.89 \pm 85.18/cmm	106.8 \pm 58.39/cmm	0.0000631
Ascitic Fluid PMN Count	2052.41 \pm 206.83/cmm	25.83 \pm 36.27/cmm	0.000044
Prothrombin Time (Expressed as Seconds over control)	15.24 \pm 14.77 seconds	7.52 \pm 6.63 seconds	0.0303

The breakup of the 29 cases of SBP into CSBP (Classical Spontaneous Bacterial Peritonitis), BA (Bacterial Ascites) and

CNNA (Culture Negative Neutrocytic Ascites) is shown in Figure 1.

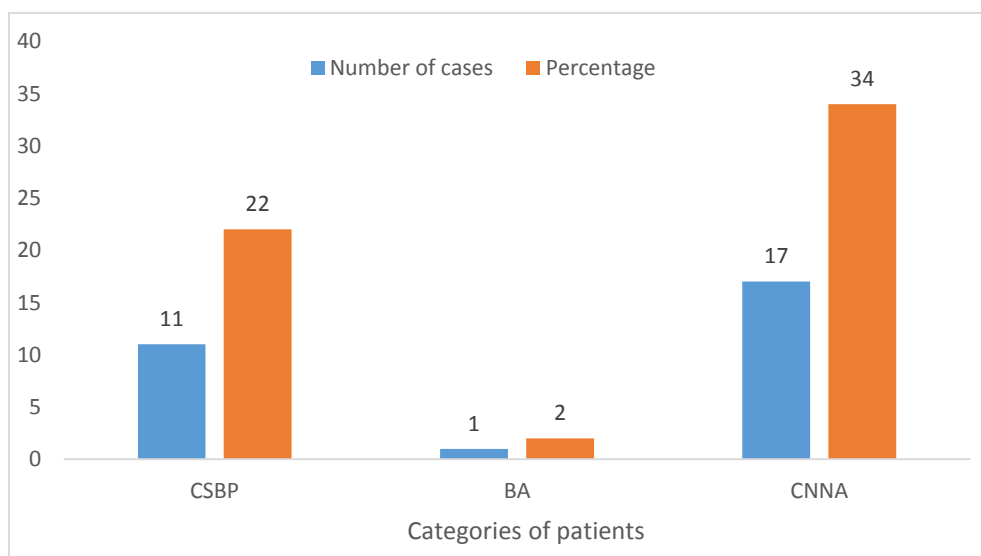


Figure 1: Breakup of the 29 cases of SBP into respective categories.

The clinical presentation of the 29 cases of SBP with regard to the presenting symptoms and their percentages are presented in Figure 2. Ascites was present in 100% of cases, followed by

Jaundice and Abdominal Pain in 93.1% each, Abdominal tenderness in 82.75%, and Fever in 75.86%. Other presentations were less frequent.

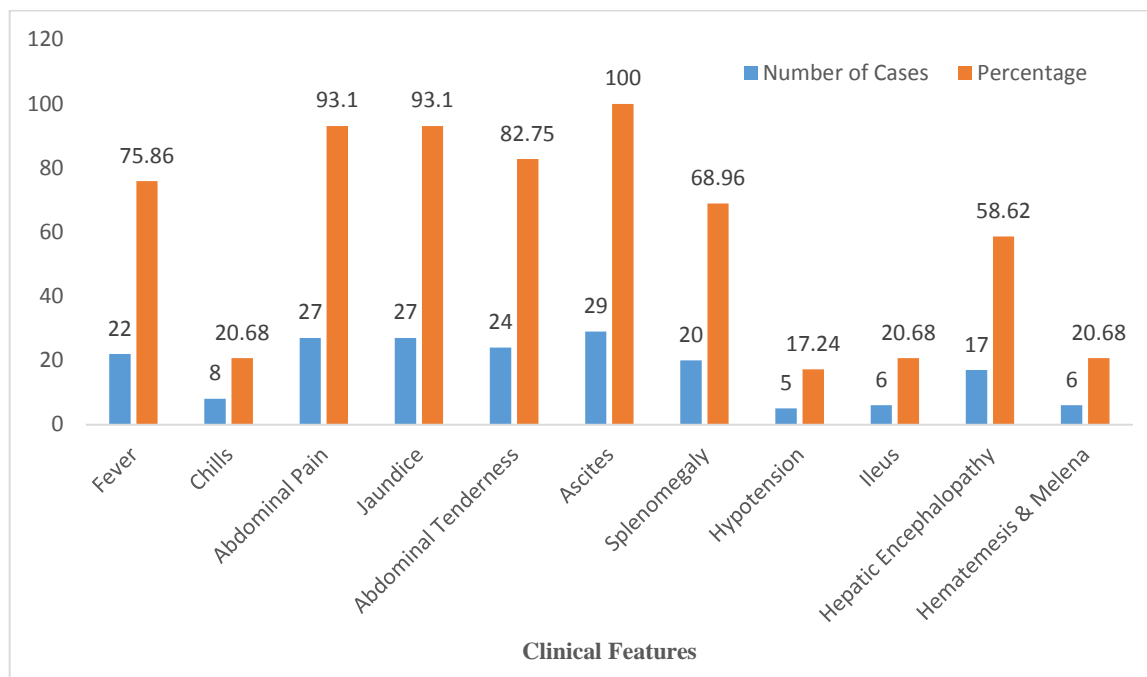


Figure 2: Clinical presentation of SB patients (n=29).

Of the 29 patients with SBP 08 were HBs Ag positive, 19 had positive anti HCV antibodies and two had evidence of both hepatitis B and C viral infections. The most frequently isolated organism was E coli (61.53%) followed by streptococcus (15.38%) and staphylococcus, Klebsiella and Acinetobacter (each in 7.69% cases).

DISCUSSION

SBP is a potentially fatal complication of cirrhosis liver. It is frequently overlooked in seriously ill cirrhotic patients leading to high mortality. Cirrhosis liver is a common problem in our local population due to high prevalence of hepatitis B and C virus infections.²⁻⁵

In our study, HCV infection was seen in 56% of cases. This finding is at odd with the other studies where chronic HBV infection was found as the most prevalent cause.^{4,5} The frequency of SBP in our study population was 58% which looks in total agreement with the similar studies piloted by Munib S, et al.,¹⁷ (58%) and Memon AQ, et al.,¹⁸ (64%), but is higher than in the studies conducted in overseas patients by Pincello G, et al.¹⁹ Ghalib R, et al.,²⁰ and Navasa M, et al.,²¹ who have reported SBP rate of 7-25%. We believe that the reasons for amplified frequency of SBP in our study may primarily be due to the comparatively poor socio-economic conditions, and undernourishment with resultant high prevalence of infectious diseases, and above all the technique of bedside ascitic fluid culture collection in commercially available blood culture bottles

(Biphasic culture System). This culture system has been reported by Runyon et al.,²² to have a sensitivity of 91%. Munib S, et al.,¹⁷ showed a sensitivity of 34.5%, in contrast to Memon AQ, et al.,¹⁸ who reported 81.25%.

We observed that the ascitic fluid cultures were seen positive in 44.82% out of 29 proven cases of SBP with 32% CNNA, 22% SCBP and 2% cases of BA. The frequency of BA and CNNA by Memon AQ, et al.,¹⁸ have been reported as 25% and 18.75% respectively. Munib S, et al.,¹⁷ has reported it as 3.44% and 66.6% cases respectively in concurrence with Rajput MR, et al.,²³ with BA in 3.5% and CNNA in 62% cases. The lower frequency of bacterial yield in our results may primarily be a result of our culture technique and warrants a need for employing more refined methods as explained by Ortiz J, et al.²⁴ Other factors like small sample size and multitude of the host immune system can also explain the comparatively poor bacterial yield.

The most frequently isolated organism was E. coli (61.53%) followed by Streptococcus (15.38%) and Staphylococcus, Klebsiella and Acinetobacter (each in 7.69% cases). These results are in total agreement with the findings by Memon AQ, et al.,¹⁸, Rajput MR, et al.,²³ and Mehr MT, et al.²⁵

CONCLUSION

High index of suspicion is necessary for the diagnosis of SBP as it can be easily missed in seriously ill patients. Ascitic fluid cultures along with the ascitic fluid PMN count are the best methods for diagnosis of SBP.

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