

Study of Frequency of Spontaneous Bacterial Peritonitis in Patients with Alcoholic Liver Cirrhosis with Ascites

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ABSTRACT

Introduction: The most common infection in cirrhosis is Spontaneous bacterial peritonitis (SBP). It is called spontaneous because it occurs in the absence of a contagious source of infection and in the absence of an intra-abdominal inflammatory focus. Majority of the SBP cases are caused by gram-negative organisms, mostly *Escherichia coli*. Objective: To identify the bacteria from the contaminated ascitic fluid and to establish the appropriate antibiotic in a case of Spontaneous bacterial peritonitis.

Material and Methods: In our study, 100 ascitic fluid samples from clinically suspected cases of SBP were collected from January 2015 to December 2015. Ascitic fluid was collected by bedside tapping in blood culture bottle aseptically and immediately sent to a microbiology laboratory, Krishna Institute of Medical Sciences, Karad, for microbiological examination. Bacterial examination and antibiotic sensitivity tests were carried out by standard microbiological techniques.

Results: 100 clinically suspected cases of SBP, 51 (51%) had ascitic fluid polymorphonuclear cells (PMN) count $\geq 250/\text{mm}^3$. Among 51 cases, 23 (23%) cases were culture positive and 28 (28%) cases were culture-negative neutrocytic ascites. From 23 culture-positive cases, *E. coli* was isolated from 13 (13%) cases; *Klebsiella* spp. was isolated from 6 (6%) cases, *Acinetobacter* was isolated from 2 (2%) cases, *Pseudomonas aeruginosa* was isolated from 1 (1%) case and *Proteus* was isolated from 1 (1%) case. All isolates were sensitive to ceftriaxone and cefotaxime.

Conclusion: The prognosis of Spontaneous bacterial peritonitis is very good provided they are diagnosed at an earlier stage, and therefore laboratory analysis including culture and sensitivity of all suspected cases of SBP will enhance the success rate.

Keywords: Spontaneous bacterial peritonitis, Ascitic fluid, Cirrhosis

INTRODUCTION

The most common and serious complication in a patient with liver cirrhosis and ascites is SBP, which can lead to high mortality.¹ It is defined as bacterial infection of ascitic fluid without any intra-abdominal source of infection. The incidence of spontaneous bacterial peritonitis in a case of cirrhosis varies from 7-23% in the west.² The diagnostic criteria for SBP states as follows, presence of $>500/\text{mm}^3$ leucocytes or the presence of $>250/\text{mm}^3$ Neutrophils in the ascitic fluid or positive ascitic fluid culture.³⁻⁵ The classification of Spontaneous bacterial peritonitis is dependent on the cell count and culture of ascitic fluid, it has been classified into its variants.^{6,7}

1. Classic spontaneous bacterial peritonitis is defined as ascitic fluid polymorph count $\geq 250/\text{mm}^3$ and positive ascitic fluid culture.
2. Culture negative neutrocytic ascites (CNNA) is defined as ascitic fluid leukocyte count $\geq 500/\text{mm}^3$ or neutrophil count $\geq 250/\text{mm}^3$ with negative ascitic fluid culture.

3. Bacterascites (BA) is defined as ascitic fluid neutrophil count $\leq 250/\text{mm}^3$ with positive ascitic fluid culture.

The mortality rate in a case of first episode of SBP varies from 10-15% which depends on various risk factors.⁸ The total mortality in one year after first episode of SBP ranges from 31-93%⁹ in fact occurrence of SBP shows poor prognosis in a patient having liver cirrhosis, which is otherwise called as critically ill cirrhosis. Patient at this stage has to be considered for undergoing liver transplantation. Thus early diagnosis and appropriate antibiotic line of management reduces the mortality rate by 20%.¹⁰ If SBP is overlooked till the establishing of complicated cirrhosis and by the time it will be diagnosed, it would be too late to check the mortality as the infective ascitic fluid would become so severe that it cannot be controlled with the appropriate antibiotic line of management. Thus, so therefore it is indeed an improvement to explore the fact and figure to identify and understand the concept of SBP in detailed context. Hence the study was conducted to see and understand the various organisms causing SBP in KIMS, Karad.

MATERIAL AND METHODS

From January 2015 to December 2015, we collected 100 ascitic fluid samples from clinically suspected cases of SBP who were admitted to the medical ward of Krishna Institute of Medical Sciences, Karad. Patients in this study were of mixed ages and consisted of both men and women; all patients met clinical criteria for suspicion of SBP including fever, ascites, and abdominal pain. Ascitic fluid was collected by bedside tapping in blood culture bottle aseptically using standard and universal precautions to ensure a sterile examination. Bacterial examination and antibiotic sensitivity tests were carried out by standard microbiological techniques. PMN count data were collected retrospectively.

Inclusion criteria: Adult patients of both genders with clinical cirrhosis of liver with ascites.

Exclusion criteria: Ascites due to renal, cardiac, tubercular, malignant pathology secondary peritonitis, pregnant women,

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How to cite this article: Makarand Mane, Priyanka Mane, Piyush Prajapati, Shivaraj Afzalpurkar, Aditya Aundhakar, Dany John. Study of frequency of spontaneous bacterial peritonitis in patients with alcoholic liver cirrhosis with ascites. International Journal of Contemporary Medical Research 2016;3(7):2057-2059.

patients who were not willing to participate in the study, and patients unable to communicate.

STATISTICAL ANALYSIS

Descriptive statistics like mean and percentage were used to calculate results. Tables were made with the help of Microsoft excel 2007.

RESULTS

100 cirrhotic patients with ascites presenting with clinical suspicion of spontaneous bacterial peritonitis were included. There were 88 male (88%) and 12 female (12%) patients. The age of patients ranged from 20–80 years. Majority of the patients were in the age group of 30–60 years. 24 were positive for HCV, 12 patients for HBsAg and 8 patients were positive for both (Table-1). In 56 patients both HBsAg and HCV were negative. Out of 100 patients, 51 were diagnosed to have spontaneous bacterial peritonitis or its variants (51%). Classic spontaneous bacterial peritonitis was present in 21 patients (21%), 28 (28%) patients were found to have culture negative neutrocytic ascites and 2 patient (2%) was having bacterascites (Table-2). Out of 51 cases of spontaneous bacterial peritonitis 23 samples of ascitic fluid showed positive culture reports. E. coli was isolated from 13 (13%) cases; Klebsiella spp. was isolated from 6 (6%) cases, Acinetobacter was isolated from 2(2%) cases, Pseudomonas aeruginosa was isolated from 1, (1%) case and proteus was isolated from 1(1%) cases

DISCUSSION

The frequency of spontaneous bacterial peritonitis in hospitalized patients with cirrhosis varies from 7 to 23% in the West.² In our study the frequency was 51% which is comparable to a study by Iqbal S et al¹¹, but higher than that reported in the world literature,¹² and some of the local data.¹³ The data extracted from our study shows the result of high frequency because of inclusion criteria which include only those patient in whom there was high clinical suspicious of SBP. The other factors which are prone to SBP are under nourishment, poverty and advance liver disease.

	Number	%
HCV	24	24
HBsAg	12	12
HCV and HBsAg	8	8
Negative	56	56

Table-1: HCV and HBsAg distribution

	Frequency	%
Classic spontaneous bacterial peritonitis	21	21
Culture Negative neutrocytic ascites	28	28
Bacterascites	2	2
Total	51	51

Table-2: Pattern of spontaneous bacterial peritonitis

	Organism	Frequency	%
<i>E. Coli</i>		13	13
<i>Klebsiella</i>		6	6
Acinetobacter		2	2
Pseudomonas aeruginosa		1	1
proteus		1	1

Table-3: Culture pattern of spontaneous bacterial peritonitis

We use blood culture bottle for the culture of ascitic fluid as the positive result is much higher than the results derived from agar plates.¹⁴ Out of 51 cases of spontaneous bacterial peritonitis, 23 samples of ascitic fluid showed positive culture reports (23%) which is comparable to that reported by Iqbal S e al¹⁵ but lower than that reported by Rajput et al.¹⁴ This might be due to the fact that maximum number of our patients were malnourished with a poor immune system and are having low threshold in terms of pathologic dose of bacteria to become ill. In our study, classic SBP was diagnosed in 21% of the patient were as the variants that is culture negative neutrocytic ascites and bacterascites was diagnosed in 28% and 2% of cases respectively. Rajput et al¹⁴

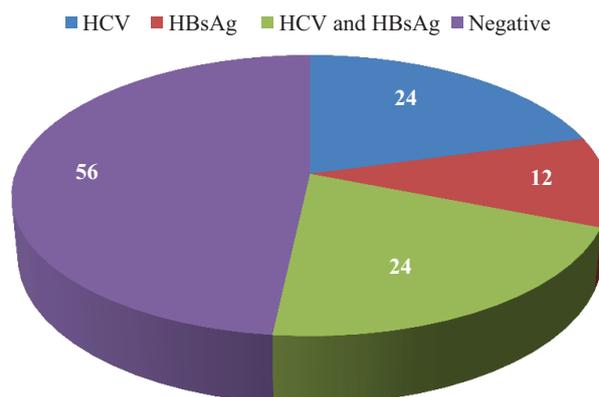


Figure-1: HCV and HBsAg distribution

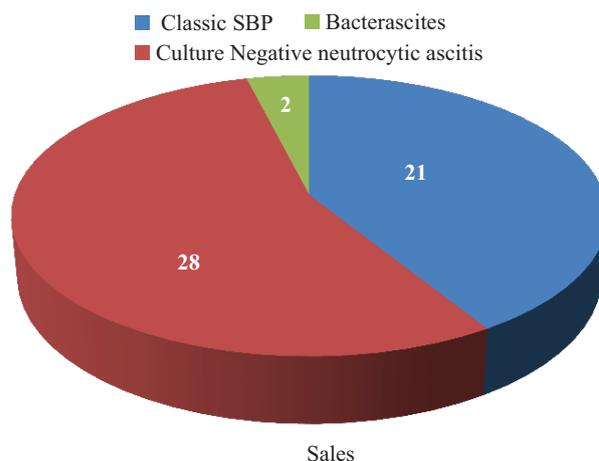


Figure-2: Pattern of spontaneous bacterial peritonitis

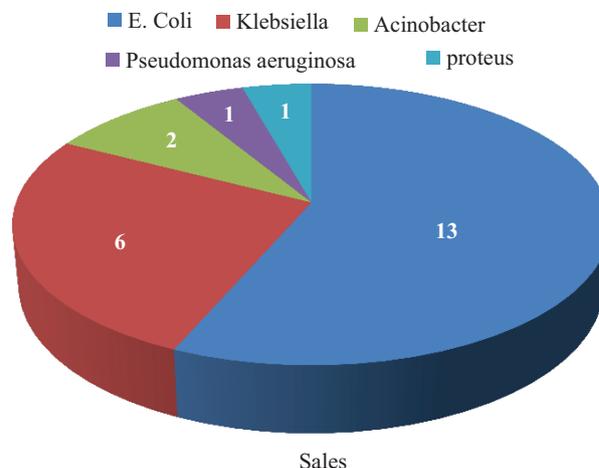


Figure-3: Culture pattern of spontaneous bacterial peritonitis

in the study conducted at Chandka Medical College Hospital Larkana found classic spontaneous bacterial peritonitis in 34.5% of their patients whereas culture negative neutrocytic ascites and bacterascites in 62.1% and 3.4% of their cases respectively. Another study by Taj et al¹⁵ conducted at Khyber Teaching Hospital supports our findings, the values are classical SBP 37.93%, CNNA 55.17% and BA 6.89%. These findings are comparable with our findings. In another study carried out by Iqbal et al³ at Rawalpindi Medical College reported classic spontaneous bacterial peritonitis in 33.3% of the cases where as culture negative neutrocytic ascites was found in 66.7% of the cases. None of the patients in this study was diagnosed having bacterascites. This difference in the frequency of bacterascites could be due to small number of patients in our study. *E. coli* was isolated from 13 (13%) cases; *Klebsiella* spp. was isolated from 6 (6%) cases; *Acinetobacter* was isolated from 2(2%) cases *Pseudomonas aeruginosa* was isolated from 1, (1%) case, and *proteus* was isolated from 1(1%) cases. These results are comparable with the findings of other studies on microbial spectrum of SBP.^{14,15}

Taj et al¹⁵ reported *E. Coli* (61.55%) and *Streptococci* in (15.38%) in their study. Haider et al¹, reported *E. Coli* 30% which is low compared to our study. The reason for this could not be explained.

CONCLUSION

The prognosis of Spontaneous bacterial peritonitis is very good provided they are diagnosed at earlier stage. The SBP and its variants are common complication of liver cirrhosis with ascitis. Among many isolated organisms, *E Coli* was the most frequent organism noted. Hence knowledge of microbial spectrum of SBP is important for the selection of appropriate antibiotic line of management.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 24-05-2016; **Published online:** 30-06-2016