

# Analysis of ascitic fluid in cirrhosis of liver for spontaneous bacterial peritonitis

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## Abstract

**Introduction:** Spontaneous bacterial peritonitis (SBP) is an infection of ascitic fluid that occurs in the absence of local source of infection. Different variants of Spontaneous Bacterial Peritonitis depending on the culture positivity and on the Polymorphonuclear leucocyte response of ascitic fluid have been described. In India the prevalence of Spontaneous Bacterial Peritonitis in the patients with cirrhosis of liver with ascites at the time of hospital admissions has been reported to be 10% to 27%. **Aims and Objectives:** To study the prevalence, incidence and clinical presentation of Spontaneous Bacterial Peritonitis in patients with Cirrhosis of liver. **Material and Methods:** The patients who were admitted at GMC Aurangabad from June 2004 to December 2006, having cirrhosis of liver with ascites. Total number of patient were considered for evaluation in the department of medicine. The study has been carried out for Two year. Detailed history and a complete physical examination were performed. Abdominal paracentesis in all patients was performed. All hematological and biochemical blood test performed. Detail examination of ascitic fluid done and culture of the same. **Summary and Conclusion:** The present study was carried out in 60 cases. There was male preponderance in our study. Maximum cases belong to 41 to 60 years. we observed in our study leucocytosis, increased total serum bilirubin and decreased total albumin levels which is statistically significant. Seven cases found to have ascetic fluid culture positive, while two had negative culture. E. coli is the most common micro organism.


**Keyword:** Spontaneous Bacterial Peritonitis.

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## INTRODUCTION

Infection of the ascitic fluid is very common and may be spontaneous or follow a previous paracentesis. Spontaneous bacterial peritonitis (SBP) is an infection of ascitic fluid that occurs in the absence of local source of infection. Different variants of Spontaneous Bacterial Peritonitis depending on the culture positivity and on the Polymorphonuclear leucocyte response of ascitic fluid have been described. This syndrome of infected ascites was first recognized and described in the European literature around the turn of the century. Over the last few decades this syndrome which was initially

greeted with scepticism has now evolved into a disorder of important significance especially due to the mortality and morbidity associated with it. This disorder is not only associated with alcoholic cirrhosis liver diseases viz. post necrotic cirrhosis, Chronic Active Hepatitis, primary biliary cirrhosis haemochromatosis etc. In India the prevalence of Spontaneous Bacterial Peritonitis in the patients with cirrhosis of liver with ascites at the time of hospital admissions has been reported to be 10% to 27%. The present study was undertaken in patients with cirrhosis of liver to determine the incidence, clinical spectrum of presentation and the microbial aetiology of this condition which has now been universally accepted as an important cause of morbidity and mortality in patients with ascites due to chronic liver diseases.

## AIMS AND OBJECTIVES

1. To study the prevalence of Spontaneous Bacterial Peritonitis in patients with liver Cirrhosis.
2. To tabulate the clinical spectrum of presentation of patients with Spontaneous Bacterial Peritonitis.

- To study the incidence of various micro organisms in the aetiology of Spontaneous Bacterial Peritonitis.

### MATERIAL AND METHODES

A prospective study was performed on patients of liver cirrhosis – 60 males and 27 females over a period of two years.

#### SELECTION CRITERIA

Patients selected were those with ascites due to liver cirrhosis.

The diagnosis of cirrhosis was established by:

Ultra sonographic evidence of a liver with coarse echo texture (shrunk in size in some cases), splenomegaly, tortuous dilated collateral vessels in the splenic hilum and portal vein size greater than 1.3cm 41. Biochemical criteria of long standing parenchymal liver disease like prolonged prothrombin time (three seconds above control) and decreased serum albumin with serum albumin: globulin ratio less than 1. Those with exudative due to a known cause. Those with history of invasive procedures like paracentesis / surgery in the last two weeks. History of antibiotic treatment in the last week. Suspected cases of perforated viscus/pancreatitis,

### OBSERVATION

**Table 1:** Sex and Agewise distribution of 60 cases of cirrhosis and Ascites

Sex	Age in years				TOTAL
	<21	21 – 40	41 – 60	>60	
Male	3 (6.53%)	15 (32.61%)	24 (52.17%)	4 (8.69%)	46 (76.67%)
Female	1 (7.14%)	6 (42.86%)	7 (50%)	0	14 (23.33%)
<b>Total</b>	<b>4 (6.66%)</b>	<b>21 (35%)</b>	<b>31 (51.67%)</b>	<b>4 (6.66%)</b>	<b>60 (100%)</b>

The majority of patients were male. In both sexes, maximum patients belonged to the age group 41 – 60.

**Table 2:** Sex and Age wise distribution of 9 cases of SBP

SEX	AGE IN YEARS				TOTAL
	<21	21 – 40	41 – 60	>60	
MALE	0	3 (42.86%)	3 (42.86%)	1 (14.28%)	7 (77.78%)
FEMALE	0	1 (50%)	1 (50%)	0	2 (22.22%)
<b>TOTAL</b>	<b>0</b>	<b>4 (44.44%)</b>	<b>4 (44.44%)</b>	<b>1 (11.12%)</b>	<b>9 (100%)</b>

In the Spontaneous Bacterial Peritonitis group also, a male predominance was found. Maximum patients were in the 21 – 40 year and 41 – 60 year groups.

**Table 3:** Incidence of clinical features in patients with spontaneous bacterial peritonitis

CLINICAL FEATURES	NO. OF CASES	%
FEVER	7	77.78
ABDOMINAL PAIN	6	66.67
JAUNDICE	8	88.89
HEPATIC ENCEPHALOPATHY	5	55.56
GI BLEED	2	22.23
ADB. TENDRENESS / REBOUND	6	66.67
SLUGGISH BOWEL SOUNDS	4	44.45
HEPATORENAL SYNDROME	01	11.12

Fever, abdominal pain, jaundice and hepatic encephalopathy were found to be significant symptoms, whereas abdominal tenderness and rebound tenderness and hypoperistalsis were significant clinical signs. None of our patients were asymptomatic.

**Table 4:** Significance of low protein value in ascitic fluid in 9 patients of SBP

ASCITIC FLUID PROTEIN	SBP	STRILE ASCITES	TOTAL
< 1 gm %	7(50%)	7(50%)	14 (23.33%)
> 1 gm %	2 (4.35%)	44(95.65%)	46 (76.67%)
	9 (15%)	51 (85%)	60 (100%)

The low ascitic fluid protein values found in the Spontaneous Bacterial Peritonitis group are found to be statistically significant as compared to that in the group with sterile ascites using Chi – square test. ( $\chi^2$  value is 24.53 which is > 3.84 therefore,  $p < 0.05$ )

**Table 5:** Distribution of organisms cultured in 9 patients of SBP

ORGANISMS	NO.	PERCENTAGE
1) E. Coli	4	44.45
2) Klebsiella Pneumoniae	2	22.23
3) Proteus Mirabilis	1	11.12
4) Streptococcus Pneumoniae	1	11.12

The commonest organism cultured was E.coli followed by Klebsiella Pneumoniae.

### DISCUSSION

Spontaneous Bacterial Peritonitis in its simplest form can be described as a disorder characterized by infection of the ascetic fluid in the absence of local source of infection. In view of the morbidity and mortality associated with this disorder, it has now gained a place of prime importance in the evaluation of patients with chronic liver disease who have deteriorated clinically. In our study, a series of 60 patients who presented to the hospital over a period of two years [ 01/06/2004 TO 31/12/2006 ] with features of liver cirrhosis with ascites were evaluated for the presence of Spontaneous Bacterial Peritonitis. There were 46 males (76.66%) and 14 females (23.33%). The age and sex distribution of

these patients. In both sexes, the majority of patients belonged to the age group of 41 to 60 years. Findings of our study are comparable with Amrapurkar D N *et al* (1992). In the Spontaneous Bacterial Peritonitis group also, a male predominance was found. Maximum patients were in the 21 – 40 year and 41 – 60 year groups. The etiology of liver cirrhosis varied in individual patients viz. 36 (60%) were alcohol related cirrhosis, while 24 (40%) were post necrotic cirrhosis. Alcoholic cirrhosis was the most common etiology in the patients of spontaneous bacterial peritonitis (6 out of 9 cases) accounting for 66.66%. Findings of our study are comparable with Amrapurkar D N *et al* (1992). This has been discussed in various studies and has been accounted for by many factors like nutritional imbalance, hypoproteinemia – particularly low protein value in ascitic fluid. Impaired chemotaxis has also been demonstrated. Of the 9 patients of spontaneous bacterial peritonitis, 2 had cirrhosis in the absence of alcoholism out of which 1 was positive for hepatitis B surface antigen. Out of these 60 cases of established cirrhosis, 9 (15%) patients had spontaneous bacterial peritonitis including its variant Culture Negative Neutrocytic Ascites as per the criteria laid down by Runyon B A. This incidence is comparable with that in Western and Indian studies. Earlier studies published in the 1970s when the concept of Spontaneous Bacterial Peritonitis was still quite premature showed a lower incidence of approximately 7% as reported in the series Kline M M and his colleagues (1976) and Wilson J P and his colleagues (1979). With more and more recognition of the disorder the prospective studies in the next decade by Albillos A and his colleagues (1990) and Almdal T P and his colleagues (1987) reported a higher incidence of about of 15%. Studies by Indian workers Amrapurkar D N and his colleagues where they studied 31 patients of spontaneous bacterial peritonitis, 26 males and 5 females, during the years October 1989 to March 1990, reported an incidence of 22.5% which was inclusive of spontaneous bacterial peritonitis as well as its variant Culture Negative Neutrocytic Ascites. Our results are comparable with these studies. This notable increase in the incidence of this disorder is a reflection of the fact that present day Physicians have a higher index of suspicion of this disease in patients with chronic liver disease. Of our 9 patients of Spontaneous Bacterial Peritonitis, 2 (22.2%) case of neutrocytic ascites were found to be culture negative and 7 (77.7%) were culture positive.

	Hoefs J C 1985	Runyon B A 1990	Our Study
Fever	67%	68%	77.7%
Abdominal Pain	60%	49%	66.6%
Rebound tenderness	42%	10%	66.6%
Sluggish bowel sounds	42%	12%	44.4%

In our study 7 out of 9 patients of Spontaneous Bacterial Peritonitis had fever accounting for 77.7% of cases. Fever is the most prominent sign in this type of infection and is the only manifestation in approximately 50% cases. In the remaining cases fever is associated with clinical signs of impaired liver function and severe sepsis such as hepatic encephalopathy, renal failure, gastro intestinal hemorrhage (particularly due to erosive gastritis and septic shock). Conn H O (1964) has reported fever in 81% 25. Similar figures have been reported by Conn H O and Fassel J M (50 -80%) 26. Thus fever is an important clinical finding which when present in a patient of cirrhosis should alert the clinician to the possibility of Spontaneous Bacterial Peritonitis.

## SUMMARY AND CONCLUSION

The present study was carried out in 60 cases. There was male preponderance in our study. Maximum cases belong to 41 to 60 years. we observed in our study leucocytosis, increased total serum bilirubin and decreased total albumin levels which is statistically significant. Seven cases found to have ascetic fluid culture positive, while two had negative culture. E.coli is the most common micro organism.

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