

INCIDENCE OF SPONTANEOUS BACTERIAL PERITONITIS IN LIVER CIRRHOSIS, THE CAUSATIVE ORGANISMS AND ANTIBIOTIC SENSITIVITY

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ABSTRACT

Objective: To find out the incidence of spontaneous bacterial peritonitis in patients with liver cirrhosis having ascites, the causative organisms and their antibiotic sensitivity.

Material and Methods: This study was conducted in Medical Ward of Khyber Teaching Hospital, Peshawar from 1st June 2001 to 31 of March 2003. Patients having liver cirrhosis confirmed previously by histopathology and now presenting with fever with or without chills, abdominal discomfort, increasing abdominal distension, confusion and hepatic encephalopathy, were included. A total of 200 patients were studied.

Results: Out of 200 patients included, spontaneous bacterial peritonitis (SBP) was present in 102 patients. Classical SBP was present in 38.23%; Culture Negative Neutrocytic Ascites (CNNA) was present in 57.84% while Bacterascites was present in 03.92% of patients. E Coli was isolated in 58.13%, Streptococcus pneumoniae in 18.60%, Staphylococcus aureus in 09.13%, Klebsiella in 09.13% and Acinetobacter in 04.65%. Out of 102 cases of SBP, blood cultures were positive in 21.56%, urine cultures in 15.68% and throat swabs in 10.78% of patients. E Coli was again the commonest organism isolated from blood cultures. All the organisms were sensitive to 3rd generation cephalosporins, and quinolones.

Conclusion: Spontaneous bacterial peritonitis is quite a common complication of liver cirrhosis with ascites. Patients usually present with abdominal pain, abdominal tenderness, fever with or without rigors, jaundice, and hepatic encephalopathy. E Coli is the commonest organism followed by streptococcal pneumoniae. Quinolones and 3rd generation cephalosporins are 100% effective in the management of spontaneous bacterial peritonitis.

Key words: Spontaneous bacterial peritonitis, E. Coli, Cefotaxime, Ofloxacin.

INTRODUCTION

Cirrhosis is a chronic disease of liver characterized by diffuse destruction and regeneration of hepatic parenchymal cells and ultimately results in disorganization of lobular architecture. The triad of parenchymal necrosis, regeneration and scarring is usually present¹. Ascites is the accumulation of free fluid in the peritoneal cavity². Spontaneous bacterial peritonitis is defined as bacterial peritonitis that occurs in cirrhotic patients with ascites, in the absence of any recognized intra-abdominal surgically treatable source of infection³. Spontaneous bacterial peritonitis is more common in end stage or decompensated liver cirrhosis with ascites⁴. Prevalence in western patients varies from 08% to 27%, but in Pakistan it varies from 32.20% to 64⁵. Low ascetic fluid albumen concentration and low opsonic proteins in ascetic fluid, predispose to SBP. The organisms reach the peritoneum via blood, due to defective reticuloendothelial system⁶ and reduced bactericidal activity of neutrophils^{7,8}. Organisms of intestinal origin account for 90% of cases⁹. Majority of cases are due to Gram negative organisms⁹, E Coli accounting for up to 50% of Gram negative organisms¹⁰⁻¹². However 25% of cases are caused by Gram positive organisms. Rarely anaerobic organisms may be involved. Blood cultures may be positive in 80% of cases⁹. Patients may present with diffuse abdominal pain, fever with or without chills, tenderness in abdomen, absent bowel sounds, worsening jaundice or hepatic encephalopathy in the absence of abdominal symptoms¹³. Patients, however, may remain asymptomatic in 10% of cases¹⁴. The diagnosis is made when ascetic fluid polymorphonuclear cell count is greater than 250/mm³ with positive ascetic fluid bacterial culture or ascetic fluid PMN cell count greater than 500/mm³ and arterial-ascitic fluid pH gradient is equal to or greater than 0.01¹⁵ or when ascitic fluid PMN cell count greater than 500/mm³, pH

less than 7.40 and lactate level greater than 25mg/dl¹⁶. It may be culture negative neutrocytic ascites if PMN cell count is greater than 500/mm³, negative culture, absent intra-abdominal infection, no antibiotic therapy in 30 days and no pancreatitis¹⁷. If PMN cell count is less than 250/mm³ but bacteria are cultured from ascetic fluid, it is called bacterascites¹⁸⁻²⁰. A number of studies have confirmed the efficacy of cefotaxime^{21,22}. Rest of the 3rd generation cephalosporins²³, combination of amoxicillin and clavulanic acid²³ and oral quinolones²⁴ especially ofloxacin have been found to be as effective as cefotaxime.

MATERIAL AND METHODS

Liver cirrhosis is a chronic disease responsible for over 10% of all the medical admissions and over 30% of all the chronic illnesses in our area²⁵. Spontaneous bacterial peritonitis is quite a common problem in patients with liver cirrhosis having ascites. It compelled us to embark on this study. The study was conducted in Medical ward of Khyber Teaching Hospital Peshawar from 1st June 2001 to 31st March 2003. We included those patients who had liver cirrhosis confirmed previously by histopathology and now presenting with fever with or without chills, abdominal discomfort, increasing abdominal distension, confusion and hepatic encephalopathy. A total of 200 patients were studied. Patient who had taken antibiotics within the previous 72 hours, or had signs of infections anywhere else were excluded from the study. After taking a detailed history and having done meticulous clinical examination, patients were subjected to a battery of relevant investigations. Peripheral blood smear, bleeding time, clotting time and ECG were done as a routine. Liver function tests included prothrombin time and serum proteins with A/G ratio. Liver biochemistry and viral profile for HBV and HCV were also done in all the cases. Renal

AGE DISTRIBUTION

S. No.	Age Range	Total No.	Percentage
1.	40	14	07%
2.	60	146	73%
3.	80	40	20%

TABLE-1

function tests included blood urea, serum creatinine and serum electrolytes. Radiological investigations included chest X. rays, plain film abdomen and ultrasound abdomen and pelvis. Applying full protocol of aseptic techniques, 20 ml fluid was aspirated from each patient in a disposable syringe. 10 ml of ascitic fluid was put in commercially available broth bottle (biphasic culture system) and sent for bacterial culture and sensitivity to various antibiotics. Rest of the 10 ml ascitic fluid was sent for routine biochemical, cytological and Gram staining. At the same time blood, urine and throat swabs were taken and sent for culture and sensitivity tests. Critically ill patients, who accounted 39, were put on injection cefotaxime in a dose of 1g i/v 12 hourly for ten days and stable patients who accounted 62, were put on oral ofloxacin 200 mg 12 hourly for ten days. All the patients recovered and went home.

RESULTS

Majority of the patients i.e., 73% were between 41-60 years of age (Table 1). Spontaneous bacterial peritonitis was present

SPONTANEOUS BACTERIAL PERITONITIS VS NON SPONTANEOUS BACTERIAL PERITONITIS

S.No.	SBP/non SBP	Total No.	Percentage
1.	SBP	102	51%
2.	NON SBP	98	49%

TABLE-2

SEX DISTRIBUTION IN SPONTANEOUS BACTERIAL PERITONITIS GROUP

S.No.	SEX	Total No.	Percentage
1.	Males	57	55.88%
2.	Females	45	44.11%

TABLE-3

in 102 (51%) patients (Table 2). Out of these 102 patients, 57 (55.88%) were males and 45(44.11%) were females (Table 3). Classical spontaneous bacterial peritonitis was present in 39(38.23%), Bacterascites in 04 (03.92%) and CNNA in 59(57.84%) patients with SBP (Table 4). Clinically 80.39% of patients presented with abdominal pain, 77.45% with abdominal tenderness, 72.25% with fever, 65.68% with jaundice, 54.90% with hepatic encephalopathy, 46.07% with chills, 20.58% with hypotension, 19.60% with haematemesis and malaena and 11.76% with ileus (Table 5). The ascitic fluid mean total leukocyte count in patients with non SBP was 116.60/mm and in patients with SBP it was 2410.89/mm. The mean ascitic fluid PMN cell count in non SBP group was 28.78/mm and in SBP group it was 1870.68/mm. The mean ascitic fluid protein concentration in non SBP group was 1.50gm% and in SBP group it was 1.00gm%, (Table 6). Out of 102 cases of SBP, 43 samples of ascitic fluid showed positive culture reports. E Coli was isolated in 25(58.13%) cases, Streptococcus pneumoniae in 08(18.60 Staphylococcus aureus in 04(09.30%), Klebsiella in 04(09.30 and Acinetobacter species in 02 (04.65%) patients (Table 8). Blood cultures were positive

TYPES OF SPONTANEOUS BACTERIAL PERITONITIS

S.No.	Type of SBP	Total No.	Percentage
1.	Classical SBP	39	38.23%
2.	Bacterascites	04	03.92%
3.	CNNA	59	57.84%

TABLE-4

CLINICAL PRESENTATION OF SPONTANEOUS BACTERIAL PERITONITIS

No.	Clinical Features	Total No.	Percentage
1.	Abdominal pain	82	80.39%
2.	Abdominal tenderness	79	77.45%
3.	Fever	74	72.25%
4.	Jaundice	67	65.68%
5.	Hepatic encephalopathy	56	54.90%
6.	Chills	47	46.07%
7.	Hypotension	21	20.58%
8.	Haematemesis and malaena	20	19.60%
9.	Ileus	12	11.76%

TABLE-5

in 22(21.56%) patients with SBP, E Coli was isolated in 72.72% cases, Streptococci in 18.18% cases and staphylococci in 09.09% cases. Urine cultures were positive in 15.68% and throat swabs cultures in 10.78% of cases, Table 7. All the organisms, cultured were sensitive to quinolones (ofloxacin and ciprofloxacin) and 3rd generation cephalosporins (cefotaxime and ceftriaxone).

DISCUSSION

Spontaneous bacterial peritonitis was detected in 51% of patients with liver cirrhosis having ascites (Table 1). This figure is quite low as compared to that of 64%, reported in a local study¹², but studies^{14,26}, from abroad have reported spontaneous bacterial peritonitis in 7-25% of

ASCITIC FLUID ANALYSIS

S. No.	Content	non SBP	SBP
1.	Albumen	1.50	1.00
2.	TLC	116.60	2410.89
3.	PMN count	28.74	1870.68

TABLE-6

CULTURE AND SENSITIVITY REPORTS IN SBP

S. No.	Samples	No. of positive cultures	Percentage
1.	Ascitic fluid	45	43.13%
2.	Blood	22	21.56%
3.	Urine	16	15.68%
4.	Throat swab	11	10.78%

TABLE-7

cirrhotic patients. The probable reasons for such high incidence in our set up may be late referral to our tertiary care hospitals, poverty and undernourishment. Out of 102 patients with spontaneous bacterial peritonitis, 4 (42.15%) patients had positive ascitic fluid culture (Table 4). This figure is slightly higher than another local report¹¹ of 33.3%, but one of the studies²⁹ from abroad has published quite a high figure of 91%. The possible reasons may be a different population group with different underlying etiologies. Our patients are usually post hepatic while alcohol is the most common cause of cirrhosis in western patients. Our patients are poor with low body weight, undernourished with poor immune system, so become ill with low pathogenic dose of bacteria. In our patients, bacterascites was present in 3.92%, which is quite high compared to none, while CNNA was low i.e. 55.17 versus 66.7% in Rajput et al study¹¹. The more

BACTERIA ISOLATED FROM ASCITIC FLUID

S. No.	Bacteria Isolated	Total No.	Percentage
1.	E Coli	25	58.13%
2.	Streptococcal pneumoniae	08	18.60%
3.	Staphylococcus aureus	04	09.30%
4.	Klebsiella	04	09.30%
5.	Acinetobacter species	02	04.65%

TABLE-8

common presenting symptoms were abdominal pain, abdominal tenderness, fever, chills, jaundice and hepatic encephalopathy, Table 5. The mean PMN cell count was 28.74/mm³ in non SBP patients, and 1870.68% in SBP group, Table 6. Similar higher percentage of PMN leukocyte count in patients with spontaneous bacterial peritonitis has been reported by all the studies^{12,28-30}, so far published. The blood cultures were positive in 21.56% of our patients, a slightly higher figure compared to 15% reported by Choudhry et al²⁷, Table 7. E Coli was isolated from ascitic fluid in 58.13% of our patients which is quite comparable to the figure of 63.64% reported locally¹¹, but is slightly higher than the figure of 50% reported from abroad by Soriano G et al¹⁰. Streptococcal pneumoniae, was the second most common organism, isolated in 18.60%, a figure comparable to that of 18.18% reported by Rajput et al¹¹. The organisms cultured, were all sensitive to cefotaxime and rest of the 3rd generation cephalosporins. The role of cefotaxime in the management of SBP has been established by a number of previous studies^{21-22,32}, while other studies have shown no statistically significant difference between cefotaxime and rest of the 3rd generation cephalosporins²³. Quinolones were another group of drugs to which our organisms were sensitive. The role of ofloxacin in the management of SBP has already been established³¹.

CONCLUSION

Spontaneous bacterial peritonitis is quite a common complication of liver cirrhosis with ascites. Patients usually present with abdominal pain, abdominal tenderness, fever with or without rigors, jaundice, and hepatic encephalopathy. Such patients usually have lower ascitic fluid albumen albumen and high PMN cell count. E Coli is the commonest organism followed by streptococcal pneumoniae. Quinolones and 3rd generation cepha-

losporins are the drugs have been proved to be 100% effective in the management of spontaneous bacterial peritonitis.

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