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SPONTANEOUS BACTERIAL PERITONITIS (SBP); SPECTRUM OF BACTERIAL FLORA CAUSING SPONTANEOUS BACTERIAL PERITONITIS (SBP) IN PATIENTS WITH LIVER CIRRHOSIS

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ABSTRACT... Background: Spontaneous bacterial peritonitis (SBP) is a bacterial infection which occurs in cirrhosis of liver complicated by ascites. To decrease the high in-hospital mortality rate of 20 to 30%, rapid diagnosis and antibiotic treatment are essential. **Objectives:** To ascertain the frequency of causative organisms of SBP. **Study Design:** Descriptive study. **Setting:** Gastroenterology Department, Nishtar Medical College/Hospital, Multan using non probability, consecutive sampling. **Period:** Jan 2017 to July 2017. **Methodology:** The study included 183 patients of liver cirrhosis having SBP. Under aseptic conditions, ascitic fluid tap was done and sent for bacterial culture. Data was analyzed by computer program SPSS-18. **Results:** Of these 183 study cases, 103 (56.3%) were male patients while 80 (43.7%) were female patients. Mean age of our study cases was 51.73 ± 9.28 years. Mean duration of disease (liver cirrhosis) was 26.43 ± 12.32 months while mean duration of SBP was 4.51 ± 1.21 days. More than half of cases (56.3%) of liver disease were caused by Chronic Hepatitis C, 13.7% were due to Hepatitis B and 16.9% of patients were alcoholics. Among the study cases, E.coli was noted in 135 (73.8%), Staph. Aureus in 17.5% and Klebsiella was noted in 8.7%. **Conclusion:** Our study indicates that E.coli is the major organism causing SBP in patients having cirrhosis of liver followed by Staph. Aureus and Klebsiella.

Key words: Spontaneous Bacterial Peritonitis, E. Coli, Cirrhosis.

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INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is a common bacterial infection which occurs in cirrhosis complicated by ascites. It occurs in 10 to 30% of patients and its in-hospital death rates reach up to 20 to 30%.¹⁻³ During the last decade, early diagnosis and prompt treatment have notably reduced the death rate from 80% to 20–30%.⁴ The incidence of SBP in hospitalized cirrhotic patients ranges from 7–23% in the West. In Pakistan it is 33%.⁵

A study conducted in Khyber teaching hospital, Peshawar reported E.coli in 58.13 %, Staph Aureus in 9.30 % and Klebsiella in 9.30% in cirrhotics having SBP.⁶ A high Child score, decreased ascitic fluid protein, and upper GI bleeding are risk factors for SBP.⁷ A large study of hospitalized patients found SBP in 11.1% of

cirrhotics, and associated death rates of 21.9%. Sixty-one percent had had community-acquired infections, while the remaining had hospital-acquired infections.⁸

SBP is diagnosed when the neutrophil count in the ascitic fluid becomes greater than 250 cells/mm³, with no sign of any intra-abdominal infection.⁹ Approximately 60% of ascitic fluid samples with a neutrophilic count > 250 cells/mm³ show no evidence of bacterial growth.⁹ This is most likely a result of prudent use of antibiotics, rapid diagnosis and the low bacteria population in SBP.

Commonly found organisms in SBP are aerobic gram-negative bacteria, such as *E. coli*.^{9,10} Gram-positive organisms are also not uncommon. Some studies also identified MRSA in up to 27%

of SBP cases.¹¹ Current belief as to the cause of this type of infection is the wide use of quinolones for SBP prophylaxis and the increasing use of invasive procedures for the treatment of cirrhosis complications.¹²

The survival rate in patients with SBP is markedly lower than in patients who had received liver transplantation. So, those patients who survive an SBP episode, liver transplant should be considered. A higher MELD (Model for End-Stage Liver Disease) score is associated with a higher SBP incidence (10% for each MELD point).¹³ The occurrence of SBP before liver transplantation does not influence patient survival, although it can put the patient at risk for major complications.¹⁴

MATERIAL AND METHODS

This descriptive study was undertaken at the Gastroenterology Department of Nishtar Medical Hospital Multan from January 2017 to July 2017. The study design was non-probability, consecutive sampling. A total of 183 patients were enrolled.

Patients who had cirrhosis of liver (defined by presence of coarse parenchymal echogenicity and irregular margins on Ultrasound abdomen with Serum Albumin < 3.5g/dL, Serum Globulin >3 g/dL, and reversal of albumin globulin ratio to lower than 1); having disease duration more than 6 months; meeting the diagnostic criteria for SBP (presence of >500/mm leucocytes and/or the presence of >250 /mm Neutrophils in the ascitic fluid and positive ascitic fluid culture) and having SBP of less than 1 week duration were included in the study. Patients with Tubercular peritonitis, congestive heart failure, diabetes, hypertension, malignancies and negative ascitic fluid culture were not included. A Performa was made to record everything. All the cases of Cirrhosis of liver with ascites, fulfilling inclusion criteria were recruited from Medical Units of Nishtar Hospital Multan. Informed consent was taken from each patient/attendant; they were briefed about objectives of this study, ensuring confidentiality and the fact that there is no risk involved to the patient while taking part in this study.

Under aseptic measures, a 22/18 gauge needle was inserted in the left flank of abdomen of the patients and 10 ml of ascitic fluid was aspirated in a heparinized disposable syringe. This was immediately introduced into blood culture bottles and sent for culture. Data analysis was done by SPSS-18.

RESULTS

Our study included a total of 183 study cases in patients having liver cirrhosis with SBP, who met inclusion criteria of our study. Of these 183 study cases, 103 (56.3%) were male patients while 80 (43.7%) were female patients. Mean age of our study cases was 51.73 ± 9.28 years (with minimum age of our study cases was 41 years while maximum age was 70 years). Mean age of the male patients was 53.97 ± 10.25 years and of the female patients was 48.84 ± 6.91 years ($p=0.000$). Majority of our study cases i.e. 112 (61.2 %) were aged 40 – 55 years of age. In our study, there were predominantly Punjabi patients (35%) followed by Saraikis (26.2%) and Pathans were 21.3% (Table-I).

Mean duration of liver cirrhosis was 26.43 ± 12.32 months while mean duration of SBP was 4.51 ± 1.21 days. Anti-HCV was positive in 103 (56.3%) while HBsAg was positive in 13.7% of our study cases. Alcoholism was noted in 31 (16.9%) of our study cases. Among our study cases, E.coli was noted in 135 (73.8%), Staph. Aureus in 17.5% and Klebsiella was noted in 8.7% of patients (Table-II).

DISCUSSION

In cirrhotic patients, SBP is quite a common infection. When a patient with liver cirrhosis and ascites complains of fever or abdominal pain, an ascitic fluid should be aspirated for culture and leukocyte count.

Our study investigated 183 patients having liver cirrhosis with SBP, who met inclusion criteria. Of these, 103 (56.3%) patients were male while 80 (43.7%) were female. Iqbal et al⁶ has also reported male gender preponderance with 55.88% which is similar to that of our study results. A study by Sheikhabaie et al¹⁵ also reported male gender predominance with male: female ratio was 1.25:1

which is in compliance with our study results. Oladimeji et al¹⁶ also reported male gender predominance with 54.8%.

Characteristic	n (%)
Age (years)	
Mean \pm SD	51.73 \pm 9.28
Range	41 to 70
Gender	
Male	103 (56.3%)
Female	80 (43.7%)
Ethnicity	
Punjabi	64 (35%)
Saraikis	48 (26.2%)
Pathans	39 (21.3%)
Mean duration of liver cirrhosis (months)	26.43 \pm 12.32
Mean duration of SBP (days)	4.51 \pm 1.21
Cause of Liver Disease	
Anti-HCV	103 (56.3%)
HBsAg	25(13.7%)
Alcoholics	31 (16.9%)

Table-I. Baseline demographic features of subjects (n=183)

Causative Organism	n (%)
E. coli	135(73.8%)
Staphylococcus aureus	32(17.5)
Klebsiella	16(8.7)

Table-II. Frequency of causative organisms among study cases (n=183)

In our study, mean age was 51.73 \pm 9.28 years (with minimum age of our study cases was 41 years while maximum age was 70 years). Our study results have documented that majority of our study cases i.e. 112 (61.2 %) were aged 40–55 years of age. Iqbal et al⁶ has also reported similar results. A study by Sheikhbaaie et al¹⁵ documented mean age of the patients with SBP was 51 \pm 9 years which is similar to that of our study results. Bibi et al¹⁷ from Karachi reported 46.45 \pm 13.71 years mean age. Oladimeji et al¹⁶ also reported 62 \pm 9 years mean age of SBP patients having liver cirrhosis.

Anti – HCV was positive in 103 (56.3%) while HBs Ag was positive in 13.7% of our study cases. History of alcohol consumption was noted in 31 (16.9%) of our study cases. Bibi et al¹⁷ from

Karachi reported that anti – HCV was positive in 68.4% while HBsAg was positive in 15.4% which is close to our findings.

In our study, E.coli was noted in 135 (73.8%), Staph. aureus in 17.5% and Klebsiella was noted in 8.7%. A study conducted in Peshawar by Iqbal et al⁶ has also reported E.coli being predominant causative agent of the SBP with 58.13 %, staph. aureus was 9.30 % and Klebsiella was 9.30 %. These findings are similar to that of our study results. Bibi et al¹⁷ from Karachi reported E.coli in 63.5 % SBP cases having liver cirrhosis which is close to our study results. Oladimeji et al¹⁶ also reported 70 % E. coli predominating among causative organisms of SBP which is close to our findings.

CONCLUSION

E.coli is the major causative organism of SBP followed by Staph. Aureus and Klebsiella. SBP is more common in males, having longer duration of liver disease and in middle aged people. Hepatitis C was the cause of more than half of the cases of liver disease.

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

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