



Frequency of Spontaneous Bacterial Peritonitis in Cirrhotic Patients with Hypoalbuminemia

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ABSTRACT

Introduction: Cirrhosis is a serious and irreversible disease. It is end result of hepatocellular injury that leads to both fibrosis and nodular regeneration. Sub-acute bacterial peritonitis is an important complication. **Objective:** To determine the frequency of spontaneous bacterial peritonitis (SBP) in cirrhotic patients presenting with hypoalbuminemia. **Subject and Methods:** This was a Cross sectional study that was conducted at Department of Medicine, Shaikh Zayed Hospital, Rahim Yar Khan from 1st April 2016 to 31st December 2016 in which 200 cases selected by non-probability, consecutive sampling were selected. The diagnosis of SBP was made according to standard criteria. **Results:** Out of total 200 patients in present study, there were 114 males and 94 females with mean age of 49.19 ± 6.671 years. There were 110 cases falling in Child Pugh class C and 90 in Class B. SBP was seen in 60 cases (30%). It was seen in 36 males (31.58%) and 24 females (16.44%) out of their respective groups with p value of 0.69. When SBP was compared with respect to age groups, it also did not reveal any significant difference ($p = 0.68$). However, significant difference was seen when SBP was seen in different child pugh classes; where out of total 60, there were 44 (40%) in Class C and 16 (17.78%) in class B having p value of 0.02. **Conclusion:** Chronic liver disease is a high burden disease in low socioeconomic countries like Pakistan. Sub-acute bacterial peritonitis is an important complication and child Pugh class C has a significant association with this.

Key Words: SBP, Cirrhosis, hypoalbuminemia

INTRODUCTION

Cirrhosis is defined histologically as a diffuse hepatic process characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules. The progression of liver injury to cirrhosis may occur over weeks to years.¹ Many forms of liver injury are marked by fibrosis, which is defined as an excess deposition of the components of the extracellular matrix (i.e. collagens, glycoproteins, proteoglycans) within the liver. This response to liver injury is potentially reversible. In contrast, in most patients, cirrhosis is not a reversible process.² Cirrhosis is most commonly caused by alcoholism, hepatitis B and hepatitis C, and fatty liver disease, but has many

other possible causes. Some cases are idiopathic.³

Chronic liver disease (CLD) causes significant morbidity and mortality, mainly due to complications i.e. spontaneous bacterial peritonitis (SBP), hepatic encephalopathy, ascites, hepatorenal syndrome (HRS), and esophageal variceal hemorrhage (EVH)].⁴ Spontaneous bacterial peritonitis (SBP) is the development of peritonitis i.e. infection in the abdominal cavity, despite the absence of an obvious source for the infection.⁵ It is a serious and potentially life-threatening complication that can occur in cirrhotic patients with ascites.⁶ In a study by Saqib et al⁷ has reported the frequency of spontaneous bacterial peritonitis (SBP) as 31% in patients with cirrhosis and hypoalbuminemia. Spontaneous bacterial peritonitis is a complication in individuals with cirrhosis, and

is common predictor for poor prognosis and increased mortality, so, specific care is made in early identification and treatment of cirrhotics with this complication.^{8,9}

Objective

To determine the frequency of spontaneous bacterial peritonitis (SBP) in cirrhotic patients presenting with hypoalbuminemia.

Operational definitions:

- Hypoalbuminemia:** serum albumin <3.5 g/dl was considered positive
- Liver Cirrhosis:** presence of all these i.e. jaundice (yellow discolouration of the skin and mucous membrane), Serum bilirubin >2mg/dl, Ascites (accumulation of fluid in the peritoneal cavity as assessed on ultrasonography and clinically i.e. positive shifting dullness on percussion) and shrunken liver < 12 cm and splenomegaly > 12.5 cm as assessed on ultrasonography, alongwith any two of the following; spider naevi (vascular lesions consisting of a central arteriole surrounded by many smaller vessels), palmar erythema (reddening of palms at the thenar and hypothenar eminences) and caput medusa (dilated periumbilical collateral veins) were taken as positive.
- Child Pugh Class:** was measured as follows;

Clinical variables	1 point	2 points	3 points
Encephalopathy	None	Grade 1-2	Grade 3-4
Ascites	Absent	Slight	Moderate or large
Bilirubin (mg/dl)	< 2	2-3	>3
Bilirubin in PBC OR	< 4	4-10	10
PSC (mg/dl)			
Albumin (g/dl)	>3.5	2.8-3.5	< 2.8
Prothrombin Time	< 4 s or	4-6 s or	>6 s or
(seconds prolonged or INR)	INR< 1.7	INR 1.7-2.3	INR >2.3

- **Child Class A** = 5-6 points
- **Child Class B** = 7-9 points
- **Child Class C** = 10-15 points

- Spontaneous Bacterial Peritonitis:** presence of all these were taken as SBP;

- Serum asitic albumin gradient >1.1.
- Total leukocyte count >500/ml.
- Neutrophil count > 250/ml.

MATERIAL AND METHODS

This was a Cross sectional study that was conducted at Department of Medicine, Shaikh Zayed Hospital, Rahim Yar Khan from 1st April 2016 to 31st December 2016 in which 200 cases selected by non-probability, consecutive sampling were selected according to following criteria.

Inclusion criteria:

- All patients of liver cirrhosis of Child Pugh class B & C (as per-operational definition) with hypoalbuminemia (as per-operational definition) of >6 months duration.
- Patients 25-65 years of age.
- Both genders.

Exclusion criteria

- Patients with obstructive uropathy as assessed on ultrasonography.
- Patients with secondary bacterial peritonitis {as assessed by having to of the following on diagnostic ascitic tab, (a) ascitic glucose < 50 mg/dl, (b) total protein > 1 g/dl (c) ascitic neutrophil count > 10,000/dl (d) ascitic lactate dehydrogenase i.e. LDH level > serum LDH}.
- Patients with peritoneal carcinomatosis (assessed on ultrasonography).
- Patients with bilateral renal parenchymal affection (assessed on ultrasonography).
- Patients with peritoneal tuberculosis (assessed on medical record).

After taking informed written consent and relevant history from each patient, blood and urine sample of each patient were sent to the laboratory for albumin levels, creatinine and sodium levels. Presence or absence of spontaneous bacterial peritonitis (SBP) in each patient was noted as per-

operational definition. Statistical analysis was performed using SPSS version 20.0. Age was presented as mean and standard deviation. Frequency and percentage were calculated for qualitative variables like gender, child pugh class (B/C) and spontaneous bacterial peritonitis (present/absent). The data was stratified against gender, age groups, child pugh class by using chi square test and p value < 0.05 was considered as significant.

Table 1: SBP with respect to gender (n=200).

SBP	Male	Female	Total
Yes	36 (31.58%)	24 (16.44%)	60 (30%)
No	78 (68.42%)	62 (72.09%)	140 (70%)
Total	114 (100%)	86 (100%)	200 (100%)

p=0.69

Table 2: SBP with respect to age groups (n=200)

Age (years)	Yes	No	Total
25 to 35	02 (50%)	02 (50%)	04
36 to 45	12 (30%)	28 (70%)	40
46 to 55	40 (32.26%)	84 (67.74%)	124
56 to 65	06 (18.76%)	26 (81.26%)	32
Total	60 (30%)	140 (70%)	200 (100%)

p=0.68

Table 3: SBP with respect to child Pugh class (n= 200)

SBP)	CLASS B	CLASS C	Total
Yes	16 (17.78%)	44 (40%)	60 (30%)
No	74 (82.22%)	66 (60%)	140 (70%)
Total	90 (100%)	110 (100%)	200 (100%)

p=0.02

RESULTS

Out of total 200 patients in present study, there were 114 males and 86 females with mean age of 49.19±6.671 years. There were 110 cases falling in Child Pugh class C and 90 in Class B. Among the co morbidities HTN and DM was seen in 9% and 20% of the cases respectively. Furthermore SBP was seen in 60 cases (30%). SBP was seen in 36 males (31.58%) and 24 females (16.44%) out of their respective groups (Table 1). This difference

was not significant with p value of 0.69. When SBP was compared with respect to age groups, it also did not reveal any significant difference (p= 0.68) as in Table 2. However, significant difference was seen when SBP was seen in different child pugh classes; where out of total 60, there were 44 (40%) in Class C and 16 (17.78%) in class B having p value of 0.02 (Table 3). Amongst the co morbidities of HTN and DM none revealed significant finding having p value of 0.32 and 1.0 respectively.

DISCUSSION

Cirrhosis is a serious and irreversible disease. It is end result of hepatocellular injury that lead to both fibrosis and nodular regeneration. Cirrhosis and chronic liver disease comprises the 10th most common cause of death in the USA. Usual presentations are upper gastrointestinal bleed, ascites, spontaneous bacterial peritonitis, hepatic encephalopathy, hepatocellular carcinoma and hepatorenal syndrome.

In this study Spontaneous bacterial peritonitis was seen in 60 out of 200 cases (30%). This finding was consistent with the studies carried out in Pakistan by Jaffery et al¹⁰ and Iqbal et al¹¹ who also found the frequency around 33%. However internationally the results were slightly at lower side ranging from 7 to 23%.¹² This difference is might be due to better health facilities and good resources in other developed countries as compared to Pakistan. Late presentation at tertiary care hospital might also be the reason.

Out of 60 cases of SBP, 36 were males as compared to 24 females; though this difference was not found significant with p value of 0.69. Similar results were seen by studies carried out by Nouman S et al¹³ and Gunjača I et al¹⁴ who also found a slightly higher rate in males but statistically not a significant difference.

SBP was mostly seen in the age group of 46 to 55 years followed by 36 to 45 years. The initial finding was consistent with a study carried out by Khan Z et al¹⁵ who also found a higher number in this age group while in their study the next highest prevalent group was 56 to 65 years though this difference was not significant like our study which had p value of 0.68. This reflects again a higher rate

of cirrhosis in younger age groups in present study as compared to other region, which may be due to higher burden of Hepatitis C virus in this territory.

It was observed that the maximum patients who developed SBP were falling in child pugh class C where out of total cases, 40% were in class C. This finding was significant with p value of 0.02. This was in contrast to a study carried out by Zaman et al¹⁶ where they found most cases in class B having 57.7% of the cases with overall frequency of SBP in 39% of the cases. This study was done in a province which is source depleted and is sited in a remote area. That might be a contributing factor that the rate was higher as well as SBP was seen in earlier Child pugh class (B).

Out of co morbidities no significant finding was seen either with HTN or DM with p value of 0.32 and 1.0 respectively. Similar results were seen by study carried by Chinnock et al¹⁷ who also did not find any significant association. However, in another study by Coral et al¹⁸ no significant numbers were seen with HTN but there was increased number of cases with DM in patients who developed SBP. The reason behind this higher risk of SBP in patients with DM was might be due to poor diabetes control which led to immunosuppression; though figures of serum sugars were not given.

CONCLUSION

Chronic liver disease is a high burden disease in low socioeconomic countries like Pakistan. Sub-acute bacterial peritonitis is an important complication and child Pugh class C has a significant association with this.

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