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ORIGINAL ARTICLE

Prevalence of Spontaneous Bacteria Peritonitis in Patients with Hypoalbuminemia and Cirrhosis

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ABTSRATCT

Background and Aim: Spontaneous bacterial peritonitis (SBP) is one of the most serious complications of ascites, resulting in liver cirrhosis infection, accounting for approximately 25% of all bacterial infections. Within a diagnostic year, the mortality rate for spontaneous bacterial peritonitis ranges from 30% to 90%. The current study attempted to determine the prevalence of spontaneous bacterial peritonitis in patients with hypoalbuminemia and cirrhosis.

Materials and Methods: This cross-sectional study was conducted on 112 cirrhosis with hypoalbuminemia patients at Medical Unit A, Hayatabad Medical Complex Peshawar and department of Gastroenterology AK CMH / Sheikh Khalifa bin Zaid Al Nahyan Hospital, Rawalakot Azad Kashmir. The duration of the study was six months from 5th January 2021 to 5th June 2021. All patients of either gender with liver cirrhosis and hypoalbuminemia aged 20 to 60 years were included in the study. Each individual was asked to provide written informed consent. Each patient's creatinine, albumin, and sodium levels were measured in the laboratory using urine and blood sample tests. Each patient's absence or presence of SBP was recorded according to the operational definition. For data analysis, SPSS version 20 was used.

Results: Of the total 112 patients, 59 (52.7%) were male and 53 (473%) were female. The overall mean age of the patients was 43.51±4.58 years whereas male and female patients had 47.36±5.62 and 39.66±3.54 years respectively. The number of patients falling in class B and Child Push class C was 50 (44.6%) and 62 (55.4%) respectively. The prevalence of spontaneous bacterial peritonitis was 48 (42.9%). Out of 48 SBP patients, 29 (60.4%) were male and 19 (39.6%) were female. The prevalence of SBP was seen in 13 (27.1%) cases of Class B and 35 (72.9%) of Class C (Child-Pugh Class) respectively. Hypertension and diabetes mellitus as comorbidities were present in 11 (9.8%) and 25 (22.3%) cases respectively.

Conclusion: In the current study, the prevalence of SBP was 42.9%. Our study revealed a higher prevalence of spontaneous bacterial peritonitis in cirrhosis patients. Also, a significant association has been found between spontaneous bacterial peritonitis and child Pugh Class C and Class B whereas SBP had no substantial connotation with gender, etiology, and even age but with disease duration.

Keywords: Cirrhosis; Spontaneous Bacterial Peritonitis; Hypoalbuminemia

INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is one of the most serious complications of ascites, resulting in liver cirrhosis infection, accounting for approximately 25% of all bacterial infections [1]. Within a diagnostic year, the mortality rate for spontaneous bacterial peritonitis ranges from 30% to 90% [2]. The development of spontaneous bacterial peritonitis (SBP), defined as the presence of >250 polymorph nuclear (PMN) cells/mm3, positive ascitic fluid bacterial culture, and no evidence of an intraabdominal infection, is one of the most serious complications associated with ascites [3]. Bacterial translocation (BT) across the bowel wall is thought to be the primary mechanism in the development of SBP [4, 5]. Cirrhosis affects millions of people worldwide. Ascites and spontaneous bacterial peritonitis are liver cirrhosis severe complications. Increased mortality of ascites is indicated by the presence of hypertension and diabetes mellitus. Adverse diuretic reactions were observed in some patients irrespective of therapy and sodium constriction effective results. Ascites complication like SBP contributes to a higher mortality rate [6]. Recognizing and treating this condition as soon as possible is critical to avoid severe injury and death [7]. The initiation of SBP prophylaxis is still contentious. Ascites and SBP will continuously impose challenges for healthcare and primary care providers, hospitalists, internists, and gastroenterologists alike, given the healthcare system's burden from liver cirrhosis [8, 9].

Chronic liver disease (CLD) is associated with significant morbidity and mortality, primarily as a result of complications such as hepatic encephalopathy, spontaneous bacterial peritonitis (SBP), hepatorenal syndrome (HRS), ascites, and esophageal variceal hemorrhage (EVH) [10]. Spontaneous bacterial peritonitis (SBP) is the abdominal cavity peritonitis development or infection without any obvious infection sources [11]. Ascites and cirrhosis patients are more susceptible to such fatal and severe complications [12]. According to Moreau et al [13], cirrhosis with hypoalbuminemia patients had the incidence of spontaneous bacterial peritonitis (SBP) of 31%. An individual with SBP like complications is an increased mortality rate predictor for deprived prognosis.

Therefore, special care is taken to identify and treat cirrhotic who have this complication [14]. The present study was an attempt to find the incidence of spontaneous bacterial peritonitis with cirrhosis and hypoalbuminemia.

MATERIALS AND METHODS

This cross-sectional study was carried out on 112 cirrhosis with hypoalbuminemia patients at Medical Unit A, Hayatabad Medical Complex Peshawar and Gastroenterology department of AK CMH / Sheikh Khalifa bin Zaid Al Nahyan Hospital, Rawalakot Azad Kashmir. The duration of the study was six months from 5th January 2021 to 5th June 2021. All patients of either gender with liver cirrhosis and hypoalbuminemia aged 20 to 60 years were included in the study. Each individual was asked to provide written informed consent. Each patient's creatinine, albumin, and sodium levels were measured in the laboratory using urine and blood sample tests. Each patient's absence or presence of SBP was recorded as per operational definition. Ultrasonography-based obstructive uropathy patients with carcinomatosis, renal parenchymal affection (bilateral), peritoneal tuberculosis, and bacterial peritonitis [protein level > 1 g/dl, lactate dehydrogenase i.e. LDH level > serum LDH, and ascitic neutrophil > 10,000/dl)] were all excluded. Ascitic albumin gradient serum below 1.1, neutrophil> 250/ml, and leukocyte >500/ml were considered positive for spontaneous bacterial peritonitis presence. Serum albumin <3.5 g/dl represented positive hypoalbuminemia. The presence of Jaundice, ascites, Serum bilirubin >2mg/dl, spider naevi, shrunken liver < 12 cm, palmar erythema, and caput medusa showed liver cirrhosis. The child Pugh classes were categorized as follows; Class A having 5-6 points, Class B 7-9 points, and Class C 10-15 points. Clinical parameters with respective grading are shown in

Table 1

Clinical Parameters	One point	Two points	Three points
Ascites	Absence	Moderate	Large
Encephalopathy	None	Grade 1-2	Grade 3-4
Albumin (g/dl)	>3.5	2.8-3.5	<2.8
Bilirubin (mg/dl)	<2	2-3	>3
Prothrombin Time	4	4-6	>6

SPSS version 20.0 was used for statistical analysis. Quantitative variables like age were expressed as mean and standard deviation (SD). Qualitative variables such as gender, spontaneous bacterial peritonitis, and child Pugh class (B and C) were described as frequency and percentage. Post-stratification chi-square test was used for variables like age group, gender, and child Pugh classes using a 5% level of significance.

RESULTS

The overall mean age of the patients was 43.51±4.58 years whereas male and female patients had 47.36±5.62 and 39.66±3.54 years respectively. The number of patients falling in class B and Child Push class C was 50 (44.6%) and 62 (55.4%) respectively. The prevalence of spontaneous bacterial peritonitis was 48 (42.9%). Out of 48 SBP patients, 29 (60.4%) were male and 19 (39.6%) were female. Hypertension and diabetes mellitus as comorbidities were present in 11 (9.8%) and 25 (22.3%) cases respectively. Of the total 112 patients, 59 (52.7%) were male and 53 (473%) were female is shown in Figure-I. Figure-II illustrate the age group wise distribution while the prevalence of SBP with respective to gender distribution is shown in Figure-III. The prevalence of SBP was seen in 13 (27.1%) cases of Class B and 35 (72.9%) of Class C (Child-Pugh Class) respectively as shown in Figure-IV.

Figure-I Gender distribution of patients (n-=112)

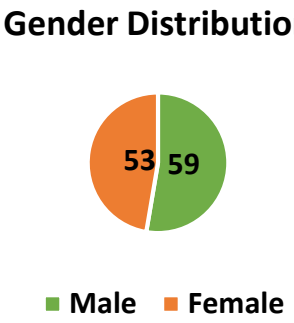
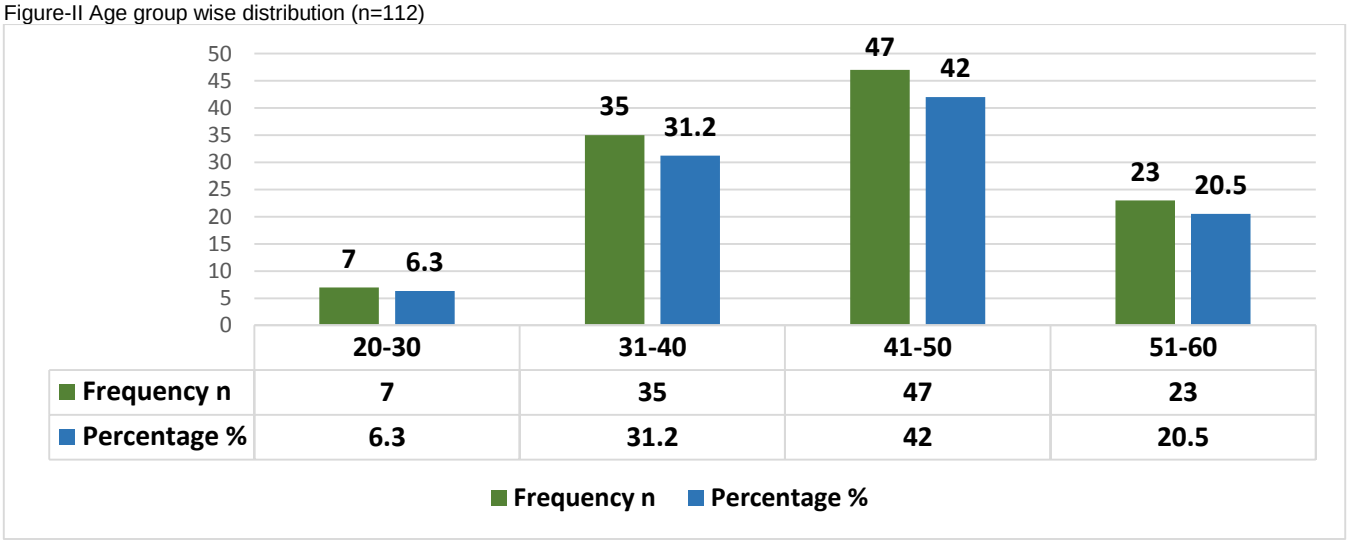


Figure-II Age group wise distribution (n=112)



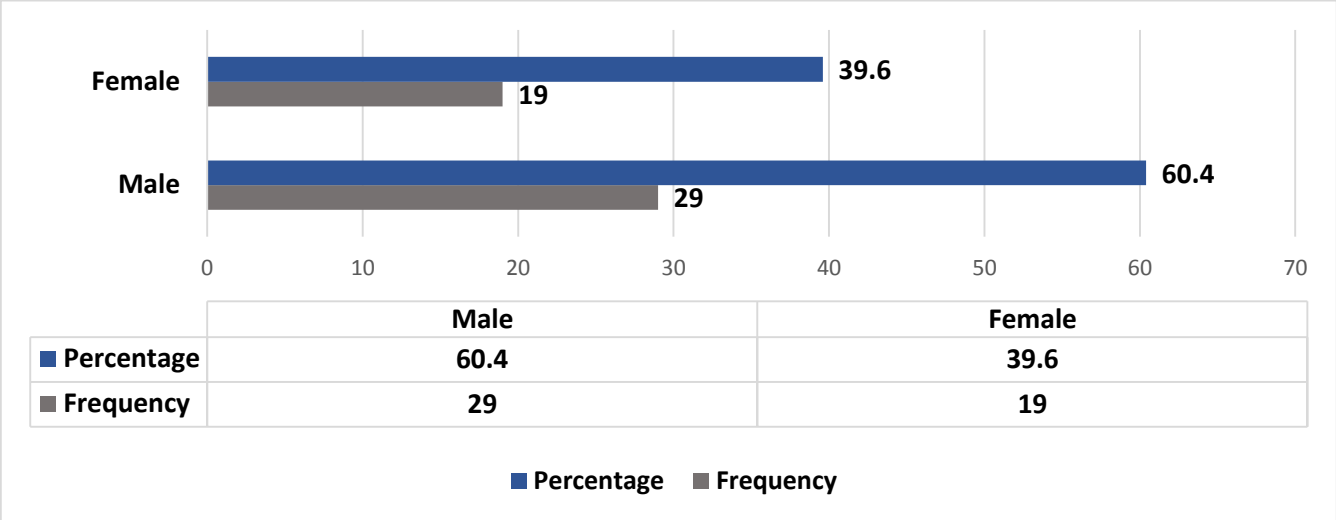


Figure-III demonstrates the prevalence of SBP based on gender distribution (n=48)

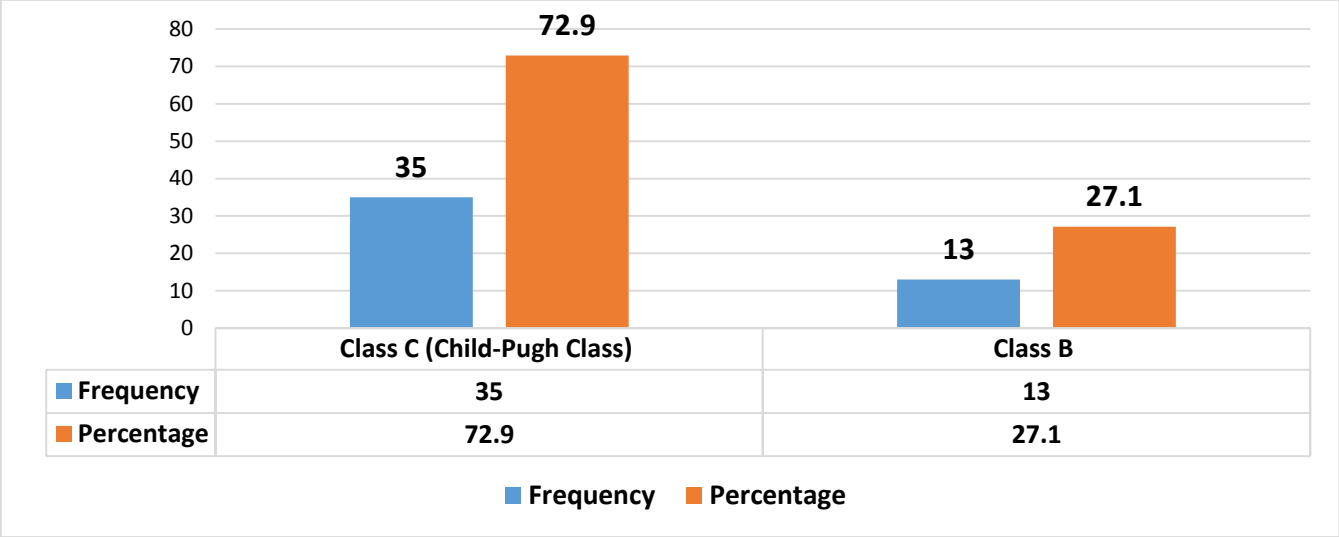


Figure-IV Prevalence of SBP with respect to Child Pugh Class

DISCUSSION

Cirrhosis is a life-threatening and irreversible disease. Fibrosis and nodular regeneration are both the result of hepatocellular injury. Cirrhosis and chronic liver disease are the tenth leading causes of mortality in the United States. Upper gastrointestinal bleeding, spontaneous bacterial peritonitis, ascites, hepatocellular carcinoma, hepatic encephalopathy, and hepatorenal syndrome are common presentations. Spontaneous bacterial peritonitis was observed in 48 of 112 cases in this study (26.8%). This finding approximately matched with previous studies conducted in Pakistan by Jalan et al. [15] and Sole et al. [16], who also discovered around 33% SBP prevalence. Internationally, however, the results were slightly lower, ranging from 7 to 23%. [17] This disparity may be due to better health care and resources in other developed countries compared to Pakistan. Late arrival at a tertiary care hospital could also be the cause.

The majority of previous studies found that ascetic fluid low protein levels were a predictor of SBP existence or reappearance and used 1 g/dl as a risk factor [18]. We discovered that the ascetic fluid protein was significantly lower in the SBP group, with a mean level of 1.21 0.52 g/dl, and thus we used a cutoff point of >1 g/dl, which was a significant predictor of the presence of SBP; many studies found results that agreed with it [19]. Other risk factors for first or recurrent SBP have been identified in previous studies, including high bilirubin levels [20, 21], low serum albumin level [22], low platelet count [23], Child-Pugh stage C [24], and increased serum aspartate aminotransferase levels [25], and but these were not significantly different between the two groups in the current study.

Out of 48 SBP cases, 29 were males and 19 were females; however, this difference was not found to be significant with a p value of 0.67. Similarly, studies conducted by Campos et al. [26] and Emerson et al [27] found a slightly higher rate in males but no statistically

significant difference. SBP was most common in people aged 46 to 55, followed by those aged 36 to 45. The initial finding was consistent with a study conducted by Joon et al [28], who also discovered a higher number in this age group, while the next highest prevalent group in their study was 56 to 65 years, though this difference was not significant, as in our study, which had a p value of 0.68. This reflects a higher rate of cirrhosis in younger age groups in the current study when compared to other regions, which may be due to a higher prevalence of Hepatitis C virus in this territory.

It was discovered that the majority of patients who developed SBP were in child Pugh class C, accounting for 31.3% of all cases. This finding was statistically significant, with a p value of 0.02. This was in contrast to a study conducted by Kardas-Słoma et al [29], who discovered that the majority of cases were in class B, accounting for 57.7 percent of the cases, with an overall frequency of SBP occurring in 39 percent of the cases. This study was conducted in a source-depleted province in a remote area. That could be one of the reasons why the rate was higher, as SBP was seen in earlier Child pugh classes (B). With p values of 0.32 and 1.0 for HTN and DM, respectively, no significant finding was seen in co morbidities. Septimus et al [30] found no significant association in their study, which yielded similar results. However, in another study by Turbett et al [31] no significant numbers of HTN cases were observed, but there was an increase in the number of cases of DM in patients who developed SBP. The reason for the increased risk of SBP in diabetic patients could be due to poor diabetes control, which led to immunosuppression; however, serum sugar levels were not provided.

CONCLUSION

In the current study, the prevalence of SBP was 42.9%. Our study revealed a higher prevalence of spontaneous bacterial peritonitis in cirrhosis patients. Also, a significant association has been found between spontaneous bacterial peritonitis and child Pugh Class C and Class B whereas SBP had no substantial connotation with gender, etiology, and even age but with disease duration.

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