

Frequency of Spontaneous Bacterial Peritonitis (SBP) in cases of Liver Cirrhosis with Ascites using PPI at tertiary care hospital

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ABSTRACT

Aim: To find out frequency of SBP in cases of liver cirrhosis with ascites using PPI at tertiary care hospital.

Methods: This cross sectional study was conducted at Department of Pathology, Quaid-e-Azam Medical College Bahawalpur from February 2019 to August 2019 over the period of 6 months. Total 192 patients of liver cirrhosis with ascites using Proton pump inhibitor (PPI) either male or female having age 20-60 years and duration of disease 1-12 months were selected from Department of Medicine and SBP was assessed.

Results: Total 192 patients of liver cirrhosis with ascites were selected and SBP was assessed, all the patients were using Proton pump inhibitor (PPI). Mean age of patients was 42.92 ± 14.51 years and mean duration of disease was 6.57 ± 3.39 months. Out of 192 patients, SBP was found in 38 (20%) patients. Male patients were 74 (38.54%) and female patients were 118 (61.46%). Statistically significant association between SBP and duration of disease was noted with p value 0.045.

Conclusion: Results of present study showed a higher rate of SBP in cases of liver cirrhosis with ascites using PPI. Results of this study also revealed that development of SBP was not significantly associated with advancing age, gender, etiology. Significant association of SBP with duration of disease was found.

Keywords: Liver cirrhosis, SBP, PPI, ascites

INTRODUCTION

In cases of liver cirrhosis, spontaneous bacterial peritonitis (SBP) is very severe and common complication and strongly associated with mortality of such patients¹. Translocation of bacteria from gut flora to mesenteric lymph nodes, SBP pathogenesis is the basic step.² In cases of liver cirrhosis, overgrowth of intestinal bacteria and increased permeability of gut are the facilitator of translocation of bacteria³. Susceptibility to various infections in cases of liver cirrhosis through different mechanisms includes neutrophil dysfunction, complement deficiency and impaired immunity⁴. Against the ingested microorganisms, gastric acidity has defensive mechanism. In the small intestine and stomach, proliferation of bacteria is increases due to reduction in gastric acid and this proliferation of bacteria causes stomach infection.⁵ Proton pump inhibitors (PPIs) inhibits the gastric acidity. Various enteric infections caused by *Clostridium difficile*, *Salmonella* and *Campylobacter*. Susceptibility of these enteric infections increased by the use of PPIs⁶. In literature, some researches suggestive of link between the use of PPIs and development of spontaneous bacterial peritonitis (SBP) in cases of liver cirrhosis with ascites; but this data is controversial.⁷ There are several mechanism have postulated that explains that increase in frequency of enteric infections is associated with the use of PPIs¹.

One factor that can affect the risk of infection which is related to use of PPI is that metabolism of PPI may be significantly impaired⁸⁻⁹.

Received on 03-08-2020

Accepted on 13-11-2020

Results of this study may help in early detection and management of SBP in these cases. In this way we may be able to reduce morbidity related to it.

Operational Definition

Cirrhosis with ascites: It was defined as Presence of any three or more of the following: jaundice (Bilirubin level >2mg/dl) anorexia, tiredness and weakness, sudden weight loss (>5kg in 1month on history) and nodules, irregular margins and increase echogenicity of the liver confirmed on ultrasonography and in result accumulation of fluid in peritoneal cavity due to portal hypertension and hypoalbuminemia.

Proton Pump Inhibitor (PPI): These are the pharmacological agents which are used to suppress acid production in stomach.

Spontaneous Bacterial Peritonitis (SBP): SBP was labeled if ascitic fluid examination showed a neutrophil count of more than 500 cells/ μ L and ascitic lactate level more than 25 mg/dl.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Pathology, Quaid-e-Azam Medical College Bahawalpur from February 2019 to August 2019 over the period of 6 months. Total 192 patients of liver cirrhosis with ascites using PPI, either male or female having age 20-60 years and duration of disease 1-12 months were selected from Department of Medicine. Patients with upper GI bleed (on endoscopy), hepatic encephalopathy (on medical record), hepatorenal syndrome (on medical record) and patients taking antibiotics (on medical record) were excluded from the study. Study was approved by the ethical committee and written informed consent was taken from every patient.

Ascitic fluid was obtained through standard procedure. All samples were sent to the laboratory for cytology. Reports were assessed and patients were labeled as positive or negative for SBP. All the data was entered in pre-designed proforma along with demographic profile of the patients.

Data was entered on SPSS version 16. The quantitative variables of the study i.e. age and duration of disease was presented as Mean±SD. The qualitative variables like gender, frequency of SBP were presented as frequency and percentages. Pie chart was drawn for frequency of SBP. Stratification was done for age, duration of disease and gender. Post stratification chi-square test was applied. P. value ≤0.05 was considered as significance.

RESULTS

Total 192 patients of liver cirrhosis with ascites using PPI were selected and SBP was assessed. Mean age of patients was 42.92±14.51 years and mean duration of disease was 6.57±3.39 months. Out of 192 patients, SBP was found in 38(20%) patients. (Fig. 1) Age range in this study was 20-60 years. Four age groups were made i.e. age group 20-30 years, age group 31-40 years, age group 41-50 years and age group 51-60 years. Total 59(30.73%) patients belonged to age group 20-30 years followed by 17 (8.85%) patients to age group 31-40 years, 37(19.27%) patients to age group 41-50 years and 79(41.15%) to age group 51-60 years. SBP was developed in 13(22.03%) patients of age 20-30 years, 3(17.65%) patients of age group 31-40 years, 9(24.32%) patients of age group 41-50 years and 13(16.46%) patients of age group 51-60 years. No statistically significant association between development of SBP and age group was found with p value 0.737 (Table 1).

Male patients were 74 (38.54%) and female patients were 118 (61.46%). Total 13(17.57%) male patients and 25(21.19%) female patients found with SBP. But insignificant association was found between SBP and gender (P value 0.540) (Table 2).

Fig. 1: Frequency of SBP

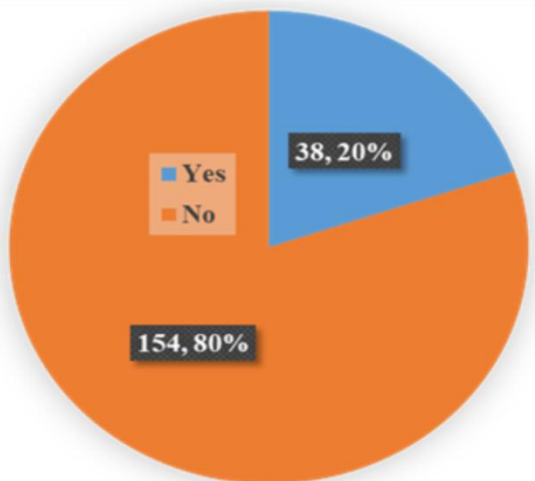


Table 1: Association of SBP with age group

Age Group	SBP		Total (%)	P value
	Yes (%)	No (%)		
20-30	13 (22.03)	46 (77.97)	59 (30.73)	0.737
31-40	3 (17.65)	14 (82.35)	17 (8.85)	
41-50	9 (24.32)	28 (75.68)	37 (19.27)	
51-60	13 (16.46)	66 (83.54)	79 (41.15)	
Total	38 (20)	154 (80)	192	

Selected patients were divided into four equal groups according to duration of disease i.e., 1-3 months, 4-6 months, 7-9 months and 10-12 months. Total 50(26.04%) patients belonged to 1-3 months groups followed by 45 (23.44%) patients belonged to 4-6 months group, 57(29.69%) patients belonged to 7-9 months group and 40 (20.83%) patients belonged to 10-12 months group. SBP was found in 6(12%) patients, 8(17.78%) patients, 10(17.54%) patients and 14(35%) patients respectively. Statistically significant association between SBP and duration of disease was noted with p value 0.045 (Table 3).

Hepatitis B was positive in 84(43.75%) patients and hepatitis C was positive in 101(52.60%) patients and 7(3.65%) patients were alcoholic. Among the hepatitis B and C positive patients, SBP was found in 15(17.86%) patients and 23(22.77%) patients respectively. But association of SBP with etiology was found statistically insignificant with p value 0.288 (Table 4).

Table 2: Association of SBP with gender

Gender	SBP		Total	P value
	Yes	No		
Male	13 (17.57)	61 (82.43)	74 (38.54)	0.540
Female	25 (21.19)	93 (78.81)	118 (61.46)	
Total	38 (20)	154 (80)	192	

Table 3: Association of SBP with duration of disease

Duration of disease	SBP		Total	P value
	Yes	No		
1-3	6 (12)	44 (88)	50 (26.04)	0.045
4-6	8 (17.78)	37 (82.22)	45 (23.44)	
7-9	10(17.54)	47 (82.46)	57 (29.69)	
10-12	14 (35)	26 (65)	40 (20.83)	
Total	38 (20)	154 (80)	192	

Table 4: Association of SBP with etiology

Etiology	SBP		Total	P value
	Yes	No		
Hep B	15 (17.86)	69 (82.14)	84 (43.75)	0.288
Hep C	23 (22.77)	78 (77.23)	101 (52.60)	
Alcohol	0	7 (100)	7 (3.65)	
Total	38 (20)	154 (80)	192	

DISCUSSION

The objective of present study was to evaluate the SBP in cases of liver cirrhosis with ascites taking PPI. Mean age of patients was 42.92±14.51 years and mean duration of disease was 6.57±3.39 months. Out of 192 patients, SBP was found in 38 (20%) patients. In one study by Khan T et al,¹⁰ total 380 patients of liver cirrhosis with ascites were selected and divided into PPI group and non-PPI group. In PPI group SBP was found in 12.63% patients and in non-PPI group SBP was found in 6.84% patients and the difference was statistically significant. Similarly another study by Min YW et al¹¹ reported statistically significant

association between development of SBP and use of PPIs (10.6% VS 5.8%, P value = 0.002). Almost three fold higher (69%) rate of SBP in cases of liver cirrhosis with ascites was reported by Bajaj JS et al¹². In a study by Miozzo SA et al,¹³ out of 151 patients SBP was developed in 22.5% patients. In one study by Hayat MK et al,¹⁴ frequency of SBP was 32% in patients of cirrhosis with ascites using PPI. daSilvaMiozzo SA¹⁵ study showed that among PPI users, SBP was present in 30.2% cases. Hayat MK et al¹⁴ reported frequency of SBP in cases of liver cirrhosis with ascites using PPI was 32%. In same study SBP was present in 29.3% male patients and in 33.9% female patients. While in our study male patients were 74 (38.54%) and female patients were 118 (61.46%). Total 13 (17.57%) male patients and 25 (21.19%) female patients found with SBP. But insignificant association was found between SBP and gender (P value 0.540). In our study, hepatitis B was positive in 84 (43.75%) patients and hepatitis C was positive in 101 (52.60%) patients and 7 (3.65%) patients were alcoholic. Among the hepatitis B and C positive patients, SBP was found in 15 (17.86%) patients and 23 (22.77%) patients respectively. But association of SBP with etiology was found statistically insignificant with p value 0.288. In one study by Miozzo SA et al,¹³ HCV was present in 36.2% patients while alcohol abuse noted in 25.6% patients.

CONCLUSION

Results of present study showed a higher rate of SBP in cases of liver cirrhosis with ascites using PPI. Results of this study also revealed that development of SBP was not significantly associated with advancing age, gender, etiology. Significant association of SBP with duration of disease was found.

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