

# FREQUENCY OF SPONTANEOUS BACTERIAL PERITONITIS IN CIRRHOTIC PATIENTS WITH ASCITES DUE TO HEPATITIS C VIRUS AND EFFICACY OF CIPROFLOXACIN IN ITS TREATMENT

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## ABSTRACT

**Objective:** The frequency of spontaneous bacterial peritonitis (SBP) in cirrhotic patients with ascites due to hepatitis "C" virus and efficacy of Ciprofloxacin in its treatment.

**Material and Methods:** This study was conducted in medical units of Khyber Teaching Hospital, Peshawar from July, 2008 to Jan, 2009. A total of 100 patients were studied. All those patients who had either already diagnosed or had symptoms and signs of chronic liver disease were included in the study. The main tool for the diagnosis of SBP was diagnostic peritoneal paracentesis which was then repeated after giving 200mg I.V ciprofloxacin for 5 days.

**Results:** The overall frequency of Spontaneous Bacterial Peritonitis in cirrhotic patients with ascites due to HCV was 38 in 100 patients (38%). 52 males and 48 females were studied. Among 38 patients with SBP, 20 were males and 18 were females. All the patients with SBP were put on intravenous ciprofloxacin for 5 days and 79 % of them responded completely.

**Conclusion:** Spontaneous bacterial peritonitis is a common complication of liver cirrhosis leading to significant morbidity and mortality. Although SBP responds excellently to Ciprofloxacin as shown in this study (79 %), even then the morbidity and mortality is high.

**Key words:** Hepatitis C virus, Spontaneous bacterial peritonitis, Ciprofloxacin.

## INTRODUCTION

Chronic hepatitis C virus infection affects an estimated 170 million people worldwide and nearly 4 million Americans.<sup>1,2</sup> An estimated 3% of the global population is infected with hepatitis C, although the prevalence ranges from 0.1 to 12%, depending on the country. This equates to approximately 170 million chronic carriers world wide. New infections occur at a rate of 1 to 3 cases per 100,000 persons per year, although the actual incidence is probably much higher because most new infections are asymptomatic.<sup>3</sup> The seroprevalence of hepatitis C in different parts of Pakistan reported in last 5 years is from 2.2% to 13.5%. The highest seroprevalence of hepatitis C is reported from Lahore (13.5%), Jamshoro and Mardan (9%).<sup>4,5,6</sup>

Hepatitis C Infection can lead to Chronic Liver Disease, Cirrhosis and Hepatocellular carcinoma and is the most frequent indication for liver transplantation.<sup>3</sup> Cirrhosis is characterized by triad of parenchymal necrosis, regeneration and scarring.<sup>1</sup>

Cirrhosis and its disease-related complications are the 12th leading cause of mortality among US adults and are responsible for nearly as many fatalities as diabetes mellitus.<sup>7</sup>

Only the minority of patients with hepatitis C infection progress to cirrhosis (20-25 %).<sup>8</sup> Ascites is the accumulation of free fluid in peritoneal cavity and among the major complications of cirrhosis, along with hepatic encephalopathy and the hemorrhage caused by the rupture of the esophageal varices.<sup>9</sup>

Patients with cirrhosis and ascites show a higher susceptibility to bacterial infections.<sup>10</sup> Spontaneous bacterial peritonitis (SBP) is the infection of the ascitic fluid that occurs in the absence of a visceral perforation and in the absence of and intra-abdominal inflammatory focus such as abscess, acute pancreatitis or cholecystitis. For diagnosis of SBP, the number of polymorphonuclear leucocytes (PMN) in the ascitic fluid obtained by paracentesis must exceed 250 cells/mm<sup>3</sup> and from bacteriological cultures only one germ must be isolated.<sup>11</sup>

Since 1970, when SBP was first described and up to the present, the mortality rate has been decreasing from 80% to 30%, due to a prompt diagnosis and the early initiation of the adequate treatment. The mortality rate of a single episode is similar to that of a variceal bleed at 20 to 40%.<sup>12, 13</sup> Many studies have confirmed the efficacy of Ciprofloxacin in its treatment.<sup>14, 15, 16</sup>

## MATERIAL AND METHODS

A descriptive, cross sectional study was conducted in Medicine Department, Khyber Teaching Hospital, Peshawar. 100 consecutive patients above age 25 years who had confirmed cirrhosis and ascites due to HCV infection, admitted to the medical units from July, 2008 to Jan, 2009 were included in the study after taking informed consent. All patients who had Hepatitis B Virus infection or other causes of cirrhosis like hemochromatosis, Budd-chiari syndrome or primary biliary cirrhosis were excluded from the study. Those patients having secondary bacterial peritonitis due to surgical problem, patients with renal, cardiac or pericardial disease, all diabetics, patients with malignant ascites or hepatoma, all out door patients and those who were not consenting, were also excluded..

Detailed history and examination was performed and each patient was thoroughly investigated (e.g. hemoglobin and total leukocyte count, liver function tests, prothrombin time, activated partial thromboplastin time, urea, creatinine, blood sugar etc ). Viral profile of each and every patient was done. Radiological investigations included chest X ray, plain film abdomen and ultrasound abdomen. Applying full protocol of aseptic techniques, 10 ml of ascitic fluid was sent for routine biochemical and cytological tests after taking written consent. All patients with SBP were put on I/V Ciprofloxacin (Ciproxin®) 200 mg BID for 5 days.

The data was analyzed using SPSS version 10.0. The data was tabulated. Mean, mode, median, percentages and ratios were recorded where necessary.

## RESULTS

A total of 100 patients were included in the study. 38 patients had spontaneous bacterial peritonitis. Therefore the frequency of spontaneous bacterial peritonitis in these cirrhotic patients was 38% as shown in Table.1.

52 patients were males and 48 were females (1.1:1). Among the 38 patients with spontaneous bacterial peritonitis, 20 (53%) were male and 18 (47%) were female (1.1:1) as shown in Fig.1.

**Table 1: SBP vs. Non SBP.**

S. No.	SBP/Non SBP	Total No. of Patients	Percentage
1	SBP	38	38%
2	Non-SBP	62	62%

**Table 2: Age Distribution in Study.**

S. No.	Age Range	Total No. of Patients	Percentage
1	25-35	4	4 %
2	36-45	14	14 %
3	46-55	38	38 %
4	56-65	34	34 %
5	66-75	10	10 %

**Table 3: Ascitic Fluid Analysis.**

S. No	Content	Non SBP	SBP
1	Albumen	1.7 gm %	0.86 gm %
2	TLC	219/mm <sup>3</sup>	2853/mm <sup>3</sup>
3	PMN Count	30.3/mm <sup>3</sup>	2357/mm <sup>3</sup>

**Table 4: Ultrasound Findings in Cirrhotic patients with Ascites due to HCV Infection.**

S. No.	Clinical Features	Percentage
1	Ascites	100 %
2	Hepatomegaly	54 %
3	Splenomegaly	36 %
4	Coarse shrunken liver	24 %
5	Thrombosed portal vein	20 %
6	Dilated portal vein	16 %

**Table 5: Ciprofloxacin Responsive Vs. Non Responsive Patients with SBP.**

S. No.	Response	Total No. of Patients	Percentage
1	Responsive	30	79 %
2	Non Responsive	8	21 %

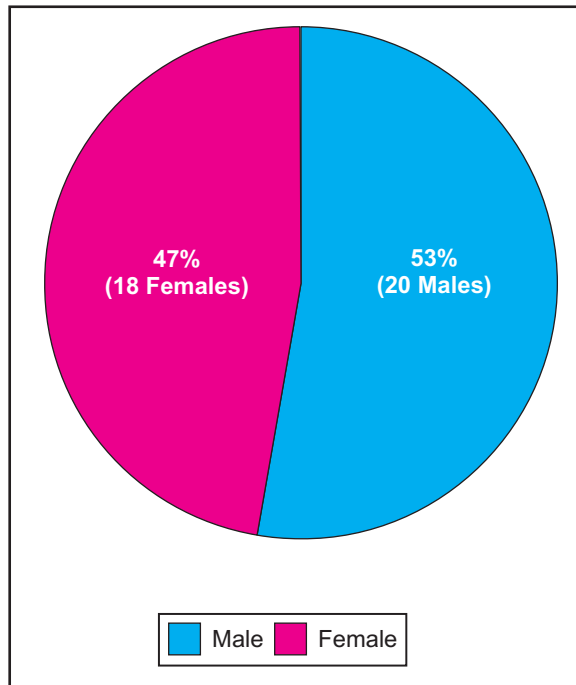
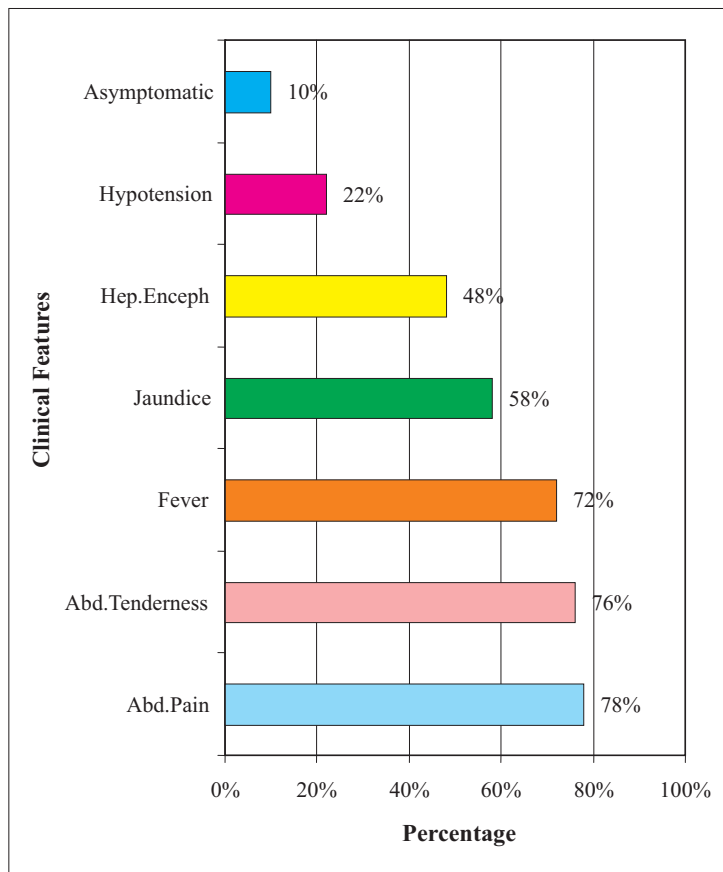


Fig 1: Sex distribution in patients with SBP.

Majority of the patients in the study were in the age range of 46-55 years as shown in the Table.2. The mean age was 54 years and the median age was 52.5 years with mode age 50 years.

The clinical features of patients with spontaneous bacterial peritonitis were diffuse with most common presentation was abdominal pain followed by abdominal tenderness, fever, jaundice, hepatic encephalopathy, hypotension and few were asymptomatic. The details are shown in Fig.2.

The ascitic fluid mean total leukocyte count in patients with Non SBP was quite low as compared to the patients with SBP. Similarly the mean ascitic fluid PMN count in SBP patients was very high than the patients with non SBP. In contrast to above, the mean ascitic fluid protein concentration in SBP patients was low as compared to mean ascitic fluid protein concentration in non SBP patients. The details are shown Table.3.



Hep.Enceph - Hepatic Encephalopathy

Abd - Abdominal

Fig. 2: Clinical features in patients with SBP.

The ultrasound findings in cirrhotic patients with ascites due to HCV infection are illustrated in Table.4.

All patients with Spontaneous Bacterial Peritonitis were put on I/V Ciprofloxacin (Ciproxin®) 200 mg BID for 5 days. 30 (79%) patients responded to the therapy and only 8 (21%) were resistant. These are shown in Table.5.

## DISCUSSION

Spontaneous Bacterial Peritonitis is one of the major complications of cirrhosis with ascites, with a prevalence of about 10-30%.<sup>17-19</sup> The risk of developing SBP is greater in those with a coexistent gastrointestinal bleed, high serum bilirubin, a previous episode of SBP, or low ascitic fluid protein concentration (less than 1gm/dl). Its mortality has been decreased from 80 to 30% due to prompt diagnosis and early initiation of adequate treatment.<sup>20</sup>

The frequency of SBP in our study was 38 %. It correlates well with a local study conducted by Iqbal S et al, whose data showed spontaneous bacterial peritonitis in 38.23%.<sup>21</sup> Sarwar S et al, another study from Pakistan, showed figure of 38%.<sup>23</sup> This study also correlates well with the present study. One another study from Pakistan, Imran M et al, showed prevalence of 31.58%.<sup>22</sup>

One study from Czech Republic, Lata J et al, showed prevalence of 35.4% which is nearly correlating the present study.<sup>31</sup> Jain AP et al from India in 1999 showed prevalence of 34.92%.<sup>24</sup> Puri AS et al, from North India showed the prevalence of 30% in one study.<sup>25</sup> These two studies also nearly correlating my study.

Contrary to the above reports which showed the prevalence of Spontaneous Bacterial Peritonitis between 30-38%, there are other studies from the other provinces of Pakistan, which report the other way. Memon AQ et al, reported high prevalence i.e. 56.25% from Nawabshah in 1999.<sup>26</sup>

Some studies showed quite low prevalence of Spontaneous Bacterial Peritonitis. Amarapurkar DN et al, reported only 22% prevalence in one study from India in 1992.<sup>27</sup> Obstein KL et al, reported 26.12% prevalence in one study recently in 2007<sup>28</sup>. Jepsen P et al, showed 27% prevalence in one study.<sup>29</sup>

A slight high percentage of Spontaneous Bacterial Peritonitis in this study from most of other studies from abroad may be due to late presentation of the patients to the tertiary care hospital, advanced stage of disease at the time of presentation, poor socio economic state, undernutrition with weak immune system and non compliance to the therapy.

Regarding the response of Spontaneous Bacterial Peritonitis to 5 days I/V Ciprofloxacin (Ciproxin®) therapy, 79% patients with SBP responded favorably and only 21% patients did not show any improvement. It correlates well with the study, Angeli P et al, which showed response rate of 80%.<sup>15</sup> Two other studies, Terg R et al, and Tuncer I et al, from abroad showed the same percentage, 78.4% and 80% respectively.<sup>14, 16</sup>

The results obtained from above mentioned studies clearly indicate that frequency of Spontaneous Bacterial Peritonitis in cirrhotic patients with ascites is quite high in general population and more over Spontaneous Bacterial Peritonitis responds quite favorably to 5 days I/V ciprofloxacin therapy.

The mean age of the patients was 54 years which is nearly correlating with the mean age in another study, Syed VA et al, (51.11 years).<sup>30</sup>

The more common presenting symptoms were abdominal pain (78%), abdominal tenderness (76%), fever (72%), jaundice (58%), hepatic encephalopathy (48%) and hypotension (22%). 10 % patients were asymptomatic. Nearly the same percentage was observed in one other local study, Iqbal S et al.<sup>21</sup>

## CONCLUSION

Spontaneous bacterial peritonitis is quite a common and major complication of liver cirrhosis with ascites. Patients usually present with abdominal pain, abdominal tenderness, fever, jaundice, hepatic encephalopathy and hypotension. SBP can be diagnosed and treated easily and hence clinicians should have a high index of suspicion and low threshold for diagnosis. SBP if diagnosed early can be treated with very good success rate up to 80%. Appropriate treatment of SBP with ciprofloxacin can help reduce morbidity and mortality in patients with chronic liver disease. More over treatment with ciprofloxacin is easy to deliver and cost effective.

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