Original Article

FREQUENCY OF SPONTANEOUS BACTERIAL PERITONITIS (SBP) IN CIRRHOTIC PATIENTS WITH ASCITES DUE TO HEPATITIS B AND C

Ali Saqib[1], Rizwan Rasul Khan[2], Zahid Masood[3], Irshad ul Haque[4]
[1]*Assistant Professor Medicine, University Medical & Dental College, Faisalabad.*
[2]*1Assistant Professor Medicine, University Medical & Dental College, Faisalabad.*
[3]*Associate Professor Community Medicine, University Medical & Dental College, Faisalabad.*
[4]*Professor of Medicine, University Medical & Dental College, Faisalabad.*

ABSTRACT

Objectives:

The frequency of Spontaneous Bacterial Peritonitis (SBP) in cirrhotic patients with ascites due to hepatitis C and B viruses

Materials and methods:

This study was conducted in Medical Unit of Madina Teaching Hospital, Faisalabad from January, 2011 to June, 2011. A total of 100 patients were studied. Patients, who were 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.

Results

The overall frequency of Spontaneous Bacterial Peritonitis in cirrhotic patients with ascites due to HCV and HBV was 31 in 100 patients (31%). 43 males and 57 females were studied. Among 31 patients with SBP, there were 13 males and 18 females.

Conclusion:

SBP is a common complication of liver cirrhosis leading to significant morbidity and mortality. The classical sign of SBP like fever and abdominal pain may not be present. We concluded from our study that cirrhosis complicated by SBP is becoming more prevalent and most of the people are unaware of the disease till very late and health education should be imparted in order to create awareness about the disease and its outcome.

Keywords: Hepatitis C virus, Spontaneous Bacterial Peritonitis, Culture Negative Neutrophilic Ascites, Polymorphoneutrophils

INTRODUCTION

Cirrhosis is a serious and irreversible disease. It is end result of hepatocellular injury that leads 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.[1]

In 1971, Conn and Fessel described a syndrome of infected ascitic fluid in patients with hepatic cirrhosis, which they named spontaneous bacterial peritonitis[2]. Spontaneous bacterial peritonitis is by definition an infection of previously sterile ascitic fluid, without any apparent intra abdominal source of infection[3]. The mortality rate of single episode is similar to that of Variceal bleed at 20-40%[4]. Ascites is thought to arise as a result of the marked circulatory and renal abnormalities that are associated with cirrhosis[5], and patients who develop this complication have a 2 year survival of approximately 50%[6].

Corresponding Author:
Dr. Ali Saqib,
Department of Medicine,
Madina Teaching Hospital, Faisalabad.
Email: alisaqib74@hotmail.com

Studies from 1970 reported that prevalence of spontaneous bacterial peritonitis was 5-10% in cirrhotic patients with ascites. Recently the prevalence of spontaneous bacterial peritonitis in cirrhotic patients with ascites admitted to hospital has been estimated at 10-30%.[7-9] The risk of developing spontaneous bacterial peritonitis is greater in those with coexistent gastrointestinal bleed, a previous episode of spontaneous bacterial peritonitis or low ascitic protein level as these patients have lower fluid complement level and opsonin activity.[10] The development of renal impairment after the diagnosis of SBP is probably the strongest independent predictor of death.

Thus the survival of patients with SBP depends upon the aggressive approach to the diagnosis and treatment and measures should be taken to prevent its recurrence. Because of high mortality of SBP a prospective study was carried out in medicine department at Madina Teaching Hospital, Faisalabad to study the prevalence of SBP in the cirrhotic patients.

MATERIALS AND METHODS

A descriptive study was conducted in Medicine Department, Madina Teaching Hospital, Faisalabad. Qualitative analysis was done. 100 consecutive patients who had confirmed cirrhosis due to HCV and HBV and ascites admitted to the medical unit from January 2011 to June 2011 included in the study after taking informed consent. All 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 and tests like Hemoglobin, total leukocyte count, liver function tests, prothrombin time, activated partial thromboplastin time, urea, creatinine and blood sugar were performed. Moreover, viral profile of every patient was done.

Abdominal ultrasound was done in all patients to find out liver size, surface and texture, splenic enlargement and ascites. Applying full protocol of aseptic techniques, 10 ml of ascitic fluid was sent for routine biochemical and cytological tests after taking written consent. Two groups of patients were formed.

1. Patients with SBP
2. Patients without SBP.

RESULTS

A total of 100 patients were included in the study. 31 patients had spontaneous bacterial peritonitis. Therefore the frequency of spontaneous bacterial peritonitis in these cirrhotic patients was 31%.

A total of 43 patients were males and 57 were females (1.1:1). Among the 31 patients with spontaneous bacterial peritonitis, 13(53%) were male and 18(47%) were female. Majority of the patients in the study were in the age range of 42-55 years. The mean age was 48 years (Table 1).

Diagnostic criteria for SBP

1	Ascitic fluid PMNs >250/cu mm and culture positive (culture positive SBP)
2	Ascitic fluid PMNs >250/cu mm and culture negative (culture negative SBP)
3	Ascitic fluid PMNs <250/cu mm and culture positive

Table 1. Age range of subjects in SBP and non-SBP

Age in years	SBP group No. of patients	Non SBP group No. of patients
51 and above	11	13
42–50	13	34
Below 42	7	22
Total:	31	69

$\chi^2 = 3.35$ n.s.

Out of 31, 13 (41.93%) were males and 18 (58.06) were females.

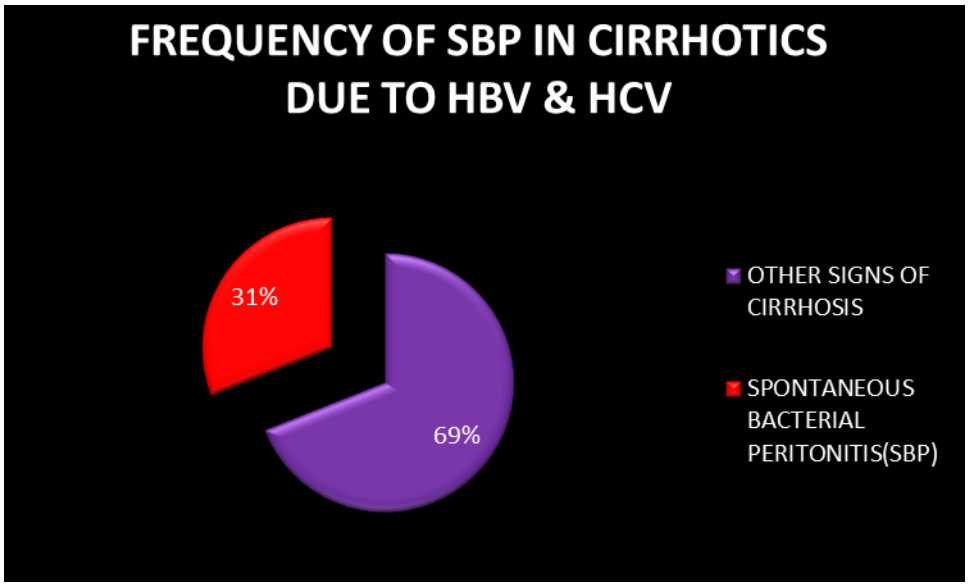
Twenty three patients (74.19%) had fever, 20 (64.51%) presented with abdominal pain, 16 (51.61%) with upper GI bleed, 20 (64.51%) with jaundice and 26 (83.87%) with clinically palpable spleen. Ascites was present in 100% of cases.

Table 2. Clinical features in the two study groups

Clinical features	SBP group		Non SBP group	
	No. of patients	%age	No. of patients	%age
Upper GI-bleed	16	51.61	30	43.47
Fever	23	74.19	22	31.88
Abdominal pain	20	64.51	18	26.08
Abdominal tenderness	13	41.93	02	02.84
Hepatic encephalopathy	19	61.29	25	36.23
Jaundice	20	64.51	22	31.88
Splenomegaly	26	83.73	35	50.72
Ascites	31	100	69	100

χ^2 = 21.80 P< 0.01

Chart showing SBP in the study group



The ascitic fluid mean total leukocyte count in patients with non SBP was quite low as compared to patients with SBP. Similarly the mean ascitic fluid PMN count in SBP was very much higher than in 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.

Table 3. Gender differences of incidence in SBP and non-SBP groups

	SBP group	Non SBP group
No. of patients	31	69
Males	13	30
Females	18	39

Table 4. Ascitic fluid analysis

Sr. #	Content	Non SBP	SBP
1	Albumen	1.7 gm %	0.86 gm %
2	TLC	219/mm^3	2853/mm^3
3	PMN Count	30.3/mm^3	2357/mm^3

DISCUSSION

Spontaneous Bacterial Peritonitis is one of the major complication of cirrhosis with ascites, with a prevalence of around 10-30%.[12] 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. [13]

The frequency of SBP in our study was 31%. It correlates well with a local study conducted by Iqbal S *et al,* whose data showed spontaneous bacterial peritonitis in 38.23%.[14] Further, a study by Sarwar S *et al.* from Pakistan, showed figure of 38%.[15] This study correlates well with the present study. Another study from Pakistan by Imran M *et al.*, showed prevalence of 31.58%.[16]

A study from Czech Republic, by Lata J *et al.,* showed prevalence of 35.4% which compliments our findings.[17] Jain AP *et al.* from India in 1999 showed prevalence of 34.92%.[18] Obstein KL *et al.,* reported 26.12% prevalence in one study recently in 2007.[19] These two studies further potentiate our findings.

A little higher prevalence of Spontaneous Bacterial Peritonitis in our study may be attributed to late presentation of the patients to the tertiary care hospital in our indigenous set up, advanced stage of disease at the time of presentation, poor socio economic status, under nutrition with weak immune system and non compliance to the therapy.

The cell criteria remained the single best index for diagnosis which was PMN >250/cu-mm in the ascitic fluid, before the results of ascitic fluid culture were available because a) Culture reports may not be available for 7 days and if we do not initiate the treatment of the patients with a serious complication immediately with empirical antibiotic regimen, the mortality would be much higher. b) The patients with Culture Negative Neutrophilic Ascites (CNNA) behave in a similar way to culture positive patients and ratio of CNNA is higher than that of culture positive18/31.

If we depend upon the culture we will be missing major proportions of patients with SBP, thus causing a greater harm to these patients by delaying the treatment.

However, the importance of ascitic fluid culture cannot be undermined because apart from giving a definite diagnosis, it also facilitate about the nature of organism and drug most suitable for the treatment.[20]

In our study culture positive cases were 6 (19.35%), they were relatively lower as mentioned in other studies, like 45% in Nawab Shah[21] and 27.77% in Khokhar study.[22] The low culture positivity in our study was probably because it was done by conventional methods instead of blood culture method. The other possibility may be that our patients take self treatment with antibiotics or from quacks, but do not give the proper history of antibiotic intake, which again shows the PMN count >250/cu-mm is the single best index for diagnosing SBP, this has been proved in other studies done at various centers of the world. [23]

The mean age of the patients was 48 years which is consistent with the mean age in another study by Syed VA *et al.* (51.11 years).[24]

The more common presenting symptoms were abdominal pain (64.51%), abdominal tenderness (41.93%), fever (74%), jaundice (64.51%), hepatic encephalopathy (61.29%) and hypotension (22%). 10% patients were asymptomatic.

CONCLUSION

SBP is a serious complication of cirrhosis of liver. 1/3 of patients admitted in the hospital with chronic liver disease have SBP and 1/3 die of this complication. The classical signs of SBP like fever, abdominal pain may not be present. Therefore a high degree of suspicion is required; abdominal tenderness may be the specific clinical sign, it is therefore recommended that;

1. Every patient with cirrhosis and detectable ascites should undergo ascitic fluid examination routinely.
2. Blood culture positive and culture negative SBP should be treated vigorously.

Furthermore, Health Education should be imparted in order to create awareness about the disease and its outcome.

REFERENCES

1. Stiburek O and Kopacova M. Spontaneous bacterial peritonitis: a severe complication of liver cirrhosis. *World J Gastroenterol*. Nov 28 2009; 15(44): 5505-10.
2. Such J and Runyon BA. Spontaneous bacterial peritonitis. Clin Infect Dis 1998; 27: 669±76.

3. Gines P, Martin PY and Neiderbeger M. Prognostic significance ofrenal dysfunction in cirrhosis. *Kidney Intl Suppl 1997;* 61.
4. Bac D-J, Siersema PD, Mulder PGH, DeMarie S and Wilson JHP. Spontaneous bacterial peritonitis: outcome and predictive factors. *Eur J Gastroenterol Hepatol 1993;* 5: 635±40.
5. Andreu M, Sola R and Sitges-Serra A. Risk factors forspontaneous bacterial peritonitis in cirrhotic patients with ascites. *Gastroenterology 1993;* 104: 1133±8. s77±82.
6. Tandon P and Garcia-Tsao G. Renel dysfunction is the most important predictor of mortality in cirrhotic patients with spontaneous bacterial peritonitis. *Clinical Gastroenterol Hepatol 2011;* 9: 260.
7. Lata J, Stiburek O and Kopacova M. Spontaneous bacterial peritonitis: a severe complication of liver cirrhosis. *World J Gastroenterol. Nov 28 2009;* 15(44): 5505-10.
8. Runyon BA. Management of adult patients with ascites due to cirrhosis: an update. *Hepatology Jun 2009;* 49(6): 2087-107.
9. Iqbal S, Iman N, Alam N and Rahman S. Incidence of Spontaneous Bacterial Peritonitis in liver cirrhosis, the causative organisms and antibiotic sensitivity. *JPMI 2004;* 18: 614-9.
10. Rasheed A, Qureshi ZA and Sarwar M. Spontaneous bacterial peritonitis in patients with cirrhosis and ascites. *Professional Med J Sep 2008;* 15(3): 371-74.
11. Imran M, Hashmi SN, Altaf A, Rashid H and Hussain T. Spontaneous Bacterial Peritonitis. *Professional Med J Jun 2006;* 13: 201-5.
12. Lata J, Fejfar T, Krechler T, Musil T and Husová L. Spontaneous bacterial peritonitis in the Czech Republic: prevalence and aetiology. *Eur J Gastroenterol Hepatol 2003;* 15: 739-43.
13. Jain AP, Chandra LS and Gupta S. Spontaneous Bacterial Peritonitis in liver cirrhosis with ascites. *Assoc Physicians India 1999;* 47: 619-21.
14. Obstein KL, Campbell MS, Reddy KR and Yang YX. Association between model for end stage liver disease and spontaneous bacterial peritonitis. *Am J Gastroenterol 2007;* 102: 2732-6.
15. Riggio O and Angeloni S. Ascitic fluid analysis for diagnosis and monitoring of spontaneous bacterial peritonitis. *World J Gastroenterol*. Aug 21 2009; 15(31): 3845-50.
16. Terg R, Fassio E, Guevara M, *et al.* Ciprofloxacin in primary prophylaxis of spontaneous bacterial peritonitis: a randomized, placebo-controlled study. *J Hepatol 2008;* 48:774.
17. Memon AQ, Memon G and Khaskheli A. Spontaneous Bacterial Peritonitis in Cirrhosis with Ascites–An Experience at PMCH Nawabshah. *Med Channel Mar 1999;* 5:31-4.21.
18. Chaudary ZI and Khokhar MS. Spontaneous Bacterial Peritonitis. *Pak J Gastroenterol Mar 1993;* 3:2 77-289.
19. Chinnock B, Gomez R and Hendey GW. Peritoneal fluid cultures rarely alter management in patients with ascites. *J Emerg Med. Jan 2011;* 40(1): 21-4.
20. Syed VA, Ansari JA, Karki P, Regmi M and Khanal B. Spontaneous Bacterial peritonitis in cirrhotic ascites: A prospective study in a tertiary care hospital, Nepal. *Kathmandu Univ Med J (KUMJ) 2007;* 5: 48-59.

Submitted for publication: 01-11-2011

Accepted for publication after major revision: 26-03-2012