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Research Article

A Study of Etiology, Clinical Profile and Prognostic Factors in Ascites Patients Having Spontaneous Bacterial Peritonitis.

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Abstract:

Ascites is the most common complication of cirrhosis. Approximately 60% of patients with compensated cirrhosis develops ascites within 10 years during the course of their disease. Spontaneous bacterial peritonitis (SBP) is a very common bacterial infection in patients with cirrhosis and ascites. It is one of the severe complications and adverse prognostic sign of cirrhosis of liver. The important issues in SBP as a clinical entity include the clinical presentation, diagnosis, risk factors, and management.

This study was conducted in a tertiary care teaching hospital in Western Maharashtra to evaluate association between aetiology, clinical profile and prognostic factors in ascites patients having SBP. A prospective study was performed on 100 patients of ascites out of which 68 were males and 32 were females. After admission all patients were interviewed and detailed history and complete physical examination was performed. In this study, the cause of ascites was cirrhosis of liver 85 (85%), cardiac 10 (10%), hypoproteinemia 3 (3%) and lastly nephrogenic 2(2%). The cause of cirrhosis of liver was - alcohol- 41 (48.23%), post-hepatitic- 37 (43.53%) and other causes (biliary, cardiac, metabolic, drug related)- 07. The commonest clinical features were jaundice - 13 (86.7%), fever - 13 (86.7%), abdominal pain - 12 (80%) followed by abdominal tenderness - 11 (73.4%), sluggish bowel sounds (ileus) - 10 (66.7%) and hepatic encephalopathy - 9 (60%). History of fever, abdominal pain, jaundice, hepatic encephalopathy, leucocytosis in blood, raised serum bilirubin (>3.2 mg/dl), low ascitic fluid pH (< 7.30), low ascitic fluid proteins (< 1 gm/dl), increased blood urea level (> 40 mg/dl) and increased serum creatinine level (> 1 .7 mg/dl) are the factors found to be associated with increased mortality and poor prognosis in patients of SBP.

Keywords: Liver Cirrhosis, Ascitis, Spontaneous Bacterial Peritonitis, Prognosis

Introduction

Ascites is the most common complication of cirrhosis. Approximately 60% of patients with compensated cirrhosis develops ascites within 10 years during the course of their disease.[1] Ascites only occurs when portal hypertension has developed[2] and is primarily related to an inability to excrete an adequate amount of sodium into urine, leading to a positive sodium balance. The development of ascites is associated with a poor prognosis and impaired quality of life in patients with cirrhosis.[3, 4]

Spontaneous bacterial peritonitis (SBP) is a very common bacterial infection in patients with cirrhosis and ascites.[95,6,7,8] It is one of the severe complications of cirrhosis of liver.[9] SBP is defined as an ascitic fluid infection without an evident intra-abdominal surgically-treatable source. It primarily occurs in patients with advanced cirrhosis.[10] But it is also reported in cases of ascites due to other causes like cardiac, nephrogenic, malignancy, hypoprotenaemia.[11,12,13,14] SBP is a frequent complication of decompensated cirrhosis with a prevalence of 10-30% in hospitalized patients and in about 3.5% of out-patients who are usually asymptomatic.[15] Once SBP develops, the prognosis of cirrhosis worsens. The median mortality during first episode of SBP has been reported to be around 30% (range 10-50%) and in such patients the median mortality at one year is reported to be about 66% (range 30-90%).[16] However, the mortality associated with first episode of SBP, has reduced considerably during the last decade due to the awareness and identification of high risk cirrhotic likely to develop SBP, its early diagnosis and effective antibiotic strategy. Recurrence of SBP is high and therefore primary and secondary prophylaxis using appropriate antibiotics is recommended.

The important issues in SBP as a clinical entity include the clinical presentation, diagnosis, risk factors, and management (empirical/specific antibiotic treatment, response evaluation, adjuvant albumin treatment and prophylaxis). Patients with concurrent renal insufficiency have been shown to be at a higher risk of mortality from SBP than those without concurrent renal insufficiency. There is recent documentation of multidrug resistant bacteria causing SBP nonresponsive to

recommended empirical antibiotics and is associated with high mortality.[17]

Aims & Objective

This study was conducted in a tertiary care teaching hospital in Western Maharashtra to evaluate association between aetiology, clinical profile and prognostic factors in ascites patients having Spontaneous Bacterial Peritonitis.

Materials and Methods

A prospective study was performed on 100 patients of ascites out of which 68 were males and 32 were females. After admission all patients were interviewed and detailed history and complete physical examination was performed.

❖ **Selection criteria**

100 patients of Transudative type of ascites were studied.

Commonest causes of transudative ascites are -

- Cirrhosis of liver
- Cardiac ascites
- Hypoproteinemia
- Nephrogenic ascites

❖ **Exclusion criteria**

- Patients with exudative ascites due to a known cause.
- Those with history of invasive procedures like paracentesis or surgery on abdomen in last two weeks.
- History of antibiotic treatment within last 3 weeks before admission.
- Suspected cases of perforated viscous or paracentesis or tuberculosis.

Diagnostic Criteria

Spontaneous bacterial peritonitis was diagnosed if

1. Ascitic fluid polymorphonuclear cell count was > 250 cells/µL along with positive ascitic fluid culture and there was no apparent local source of infection.

OR

2. If ascitic fluid culture was negative and polymorphonuclear cell count was >500 cells/µL and no antibiotics were received in last three weeks, a diagnosis of culture negative neutrocytic ascites (CNNA) was made.

OR

3. If ascitic fluid culture was positive for a single organism and polymorphonuclear cell count <250 cells/µL.

Results

In this study, the cause of ascites was cirrhosis of liver 85 (85%), cardiac 10 (10%), hypoproteinemia 3 (3%) and lastly nephrogenic 2(2%) (Table-1). In our study aetiology of cirrhosis of liver varied in 85 patients. Majority of male patients were alcoholic. Depending upon history given by patient, clinical findings and ultrasonography picture, the cause of cirrhosis of liver was as follows in our study – Alcohol- 41 (48.23%), post-hepatitic- 37 (43.53%) and other causes (biliary, cardiac, metabolic, drug related)- 07 (8.24%) (Table- 2).

The clinical features of spontaneous bacterial peritonitis are shown in Table-3. The commonest clinical features were jaundice - 13 (86.7%), fever - 13 (86.7%), abdominal pain - 12 (80%) followed by abdominal tenderness - 11 (73.4%), sluggish bowel sounds (ileus) - 10 (66.7%) and hepatic encephalopathy - 9 (60%). 12 out 15 patients of SBP presented with abdominal pain which was associated with tenderness in abdomen in 11 (73.4%) patients.

History of fever, abdominal pain, jaundice, hepatic encephalopathy, leucocytosis in blood, raised serum bilirubin (>3.2 mg/dl), low ascitic fluid pH (< 7.30), low ascitic fluid proteins (< 1 gm/dl), increased blood urea level (> 40 mg/dl) and increased serum creatinine level (> 1 .7 mg/dl) are the factors found to be associated with increased mortality and poor prognosis in patients of SBP (Table-4).

Discussion

Ascites is accumulation of fluid in the peritoneal space. Spontaneous bacterial peritonitis (SBP) is primary abdominal infection due to bacteraemia in the absence of an obvious intra-abdominal focus of infection. Rarely an identifiable source of infection such as intra-abdominal abscess or perforated viscous is responsible (in which case it is called as secondary peritonitis). SBP is a common complication occurring in cirrhotic patients with ascites.

In our study (over a period of 20 months) 100 patients who were admitted in the hospital with features of ascites due to chronic liver, cardiac and renal disease and hypoproteinemia were evaluated for the presence of spontaneous bacterial peritonitis. The diagnosis of nephrogenic ascites was made, based on ultrasonographic evidence of bilateral shrunken kidneys, loss of corticomedullary differentiation, increased echogenicity and deranged renal function tests, uremic encephalopathy in patients of chronic renal failure. Also, urine was examined for proteins and 24 hours-urinary proteins in the patients with nephrotic syndrome. There were 2 (2%) patients of nephrogenic ascites. Cardiac ascites was seen in patients of congestive cardiac failure due to rheumatic valvular heart disease, cardiomyopathies and severe anemia, which was detected by 2D Echo, colour doppler, ECG, and laboratory investigations as hemogram. Hypoproteinemia causing anasarca and ascites is also a known cause of ascites. In this study, 3% patients of ascites were due to hypoproteinemia. All were nutritional in origin. This has been discussed in various studies and has been accounted for by many factors like nutritional imbalance, hypoproteinemia mainly low protein value in ascitic fluid. Impaired chemotaxis has also been demonstrated.

The diagnosis of cirrhosis of liver was based on history given by patients, clinical findings and ultrasonographic evidence of cirrhosis of liver. Though needle biopsy of liver is a confirmatory investigation to diagnose cirrhosis of liver, we did not perform biopsy of liver in this study; essentially to avoid unnecessary risk to the patients. The diagnosis was quite evident on ultrasonography if there was evidence of shrunken

liver, with increased echogenicity, nodularity, splenomegaly, dilated portal vein more than 1.3 cm and collaterals at porta hepatis and hilum of spleen.[18]

In a study done by Hoefs JC[19] et al clinical features of spontaneous bacterial peritonitis were fever (67%), abdominal pain (60%), rebound tenderness - (42%) and sluggish bowel sounds (42%). Our findings are more or less consistent with this study. Fever is a prominent sign in spontaneous bacterial peritonitis. Conn HO and Fessel JM[20] reported fever is an important clinical finding, which when present in patients of ascites should strike the mind regarding possibility of SBP. In our study, fever was present in 86.7% of patients. Abdominal pain is another important symptom. It may be associated with generalised abdominal tenderness / rebound tenderness. 12 (80%) out of 15 patients of SBP presented with abdominal pain which was associated with tenderness in abdomen in 11 (73.4%) patients. Hoefs JC and Canawati HN in their study of 43 patients of SBP reported abdominal pain in 51% and rebound tenderness in 47% cases.[21]

Sluggish bowel sounds (ileus) were observed in 10 (66.7%) cases. It is an important sign. As it is an objective sign, it has value in patients with hepatic encephalopathy in whom history of abdominal pain is difficult to assess due to altered sensorium. Sluggish bowel sounds were due to inflammation of peritoneum and due to neuromuscular dysfunction. Conn and Fessel described this finding in 70% cases in their study.[20]

In our study we came across 9 (60%) patients who showed clinical features of hepatic encephalopathy in the form of mild confusion to deeply comatose state and flapping tremors (Asterixis). Hofes JC and Canawati HN have reported decreased mentation and asterixis in 51% and 46% cases respectively.[21] Melvin P Weinstein et al reported hepatic encephalopathy in 54% (15 out of 28) cases of SBP.[22]

There was significantly increased likelihood of death if evidence of hepatic encephalopathy was present. This sign was an early rather than late finding being noted at the time of diagnosis in all patients, in whom it was detected. Mortality was high in patients of hepatic encephalopathy with SBP. Seven (46.7%) patients expired even after starting antibiotics before discharge from the hospital. Out of those 7 patients, 5 (71.4%) had hepatic encephalopathy and remaining 2 (28.57%) had features of septicemia. Hepatic encephalopathy and septicemia are poor prognostic signs in patients of SBP. In a study Lucas K in 2001, reported mortality in SBP patients up to 46%.[23]

History of fever, abdominal pain, jaundice, hepatic encephalopathy, leucocytosis in blood, raised serum bilirubin (>3.2 mg/dl), low ascitic fluid pH (< 7.30), low ascitic fluid proteins (< 1 gm/dl), increased blood urea level (> 40 mg/dl) and increased serum creatinine level (> 1 .7 mg/dl) are the factors found to be associated with poor prognosis in SBP.[24]

Conclusion

Spontaneous Bacterial Peritonitis remains a common and severe complications of cirrhosis of liver. It primarily occurs in patients with advanced, decompensated cirrhosis. SBP is harbinger of adverse prognosis in cirrhotic patients. The clinical presentation is vague and non-specific. Fever, abdominal pain, jaundice, leukocytosis, low ascitic fluid proteins, renal dysfunction and hepatic encephalopathy are the indicators of poor prognosis. The clinicians need to have high index of suspicion regarding development of SBP in cirrhotic patients since appropriate antibiotic therapy may prove life-saving.

Table 1: Aetiology Wise Distribution of 100 Cases of Ascites

Aetiology of ascites	**No. of patients (5)**
Cirrhosis of liver	85 (85.0%)
Cardiac ascites	10 (10.0%)
Hypoproteinemia	03 (3.0%)
Nephrogenic ascites	02 (2.0%)
Total	**100 (100.0%)**

Table 2: Aetiology of Cirrhosis of Liver

(Based on history, clinical findings and ultrasonographic evidence) (n=85)

Aetiology	**No. of cases (%)**
Alcohol	41 (48.23%)
Post hepatitis	37 (43.53%)
Others (Biliary, Cardiac, Metabolic, Inherited, Drug related)	07 (8.24%)

Table 3: Incidence of Clinical Features in Patients of SBP (N=15)

Clinical features	**No. of cases**	**Percentage**
Jaundice	13	86.7%
Fever	13	86.7%
Abdominal pain	12	80.0%
Abdominal tenderness or Rebound tenderness	11	73.4%
Sluggish Bowel sounds	10	66.7%
Hepatic Encephalopathy	09	60.0%

Table 4: Prognostic Criteria in Patients of SBP

Prognostic criteria	**Conditions of SBP patient at discharge**		**Total (%) 15**
	Alive (n=8)	**Expired (n=7)**	
Fever	6 (75%)	7 (100%)	13 (86.7%)
Abdominal pain	6 (75%)	6 (85.7%)	12 (80.0%)
Alcohol consumption present	5 (62.5%)	3 (42.85%)	08 (53.33%)
Jaundice	7 (87.5%)	6 (85.7%)	13 (86.7%)
Hepatic Encephalopathy	4 (50%)	5 (71.4%)	09 (60.0%)

Leucocytosis in blood	4 (50%)	5 (71.4%)	09 (60.0%)
Serum bilirubin (>3.2mg/dl)	7 (87.5%)	6 (85.7%)	13 (86.7%)
pH of ascitic fluid (< 7.30)	5 (62.5%)	4 (57.1%)	09 (60.0%)
Ascitic fluid protein (< 1.0 gm/dl)	7 (87.5%)	5 (71.4%)	12 (80.0%)
Raised blood urea level (>40 mg/dl)	3 (37.5%)	4 (57.1%)	07 (46.7%)
Raised serum creatinine level (>1.7 mg/dl)	3 (37.5%)	3 (42.85%)	06 (40.0%)

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