ORIGINAL ARTICLE

Recognition of Spontaneous Bacterial Peritonitis in Cirrhosis with Ascites at PMC Hospital Nawabshah

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ABSTRACT

Objective: To determine the diagnosis and prevalence of spontaneous bacterial peritonitis in patients having cirrhosis of liver with ascites at tertiary care centre.

Study Design: Cross sectional study.

Place and Duration: Department of Medicine Peoples University of Medical & health Science Nawabshah, from January 2013 to December 2015.

Material and Methods: A total of 102 Cirrhotic patients with ascites admitted in all three medical units were studied. Diagnosis of cirrhosis was based on clinical features, laboratory findings and sonographic features. Patients who received antibiotic in preceding week were not included in the study. All patients underwent diagnostic paracentesis after admission. Ascitic fluid aspirated was sent for culture and for protein and cell count. Blood sample was sent for blood CP, LFT, PT, serum protein, and AG Ratio, Blood urea, Blood Sugar, and serum creatinine.

Result: Out of those 102 patients studied 27(26.5%) patients were having SBP. 9(33.3%) patients Classical SBP, 17(63%) patients had culture negative neutrocytic ascites (CNNA) and 1(3.7%) patient developed nonomicrobial non-neutrocytic bacterascites (MNB). In SBP patients abdominal pain, fever and encephalopathy were common. Among patients with SBP there were high serum bilirubin, prolonged prothrombin time and low ascitic fluid protein levels. Gram negative organisms were responsible for majority of cases of SBP.

Conclusion: SBP is common complication of cirrhosis with ascites. Common clinical features are fever, abdominal pain and encephalopathy, and patients with total ascitic fluid protein at lower level are prone to develop SBP.

Key Words: Spontaneous Bacterial Peritonitis, Ascites, Cirrhosis.

INTRODUCTION:

Spontaneous bacterial peritonitis (SBP) is frequent and severe infection occurring in cirrhotic patients with ascites in the absence of intra abdominal source of infection. Conn used the term SBP for first time in his 1964 paper[1]. It is defined as an infection of ascitic fluid that occurs in the absence of intra abdominal source of infection or malignancy.SBP is diagnosed when ascitic fluid polymorphonuclear (PMN) cells are more than 250 cells /mm^3 and only organism one is cultured from ascitic fluid. If more than one organism is present on culture that raises the suspicion of secondary peritonitis. Most common organisms causing SBP are gram negative bacilli E- coli and klebsiella but in 25% of cases gram positive organism as streptococci and enterococci are involved. This is more common in patients taking fluroquinolones for secondary prophylaxis[2].

Two variants of SBP have been described on the basis of ascitic fluid count and culture results.

- Culture negative neutrocytic ascites (CNNA): it is present when ascitic fluid PMN count is more than 250 cells/mm^3 with negative culture.

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● Monomicrobial non neutrocytic bacterascites (MNB): is present when PMN count is less than 250 cells/mm^3 but growth of a single organism is detected on culture.

Susceptibility of cirrhotic patients to SBP is due to altered gut permeability, overgrowth of bacteria, and suppression of reticuloendothelial system. Patients with total ascitic fluid protein <1g/dl are at risk to develop SBP[3].

Most commons signs and symptoms of SBP are Fever, Abdominal pain, Encephalopathy, Diarrhea, Ileus, Shock, and Hypothermia. Patients who develop SBP have severe impairment of liver function and they belong to child Pugh grade B or C[3]. Thirteen % of patients of SBP have no signs and symptoms[4].

If patient with cirrhotic ascites shows leucocytosis, raised blood urea serum creatinine or metabolic acidosis on investigation then he should be investigated for SBP without waiting for other clinical features[5]. Diagnosis of SBP is made by examination of ascitic fluid. Fibrinolysis and DIC are contraindication for paracentesis[6] Ascitic fluid should be examined in all cirrhotic patients with ascites who develop (a) fever, abdominal pain, mental state change, septic shock or (b) during gastro intestinal hemorrhage before antibiotic administration[7].

Ascitic fluid PMN count >250 cells/mm^3 is most sensitive and single best parameter to diagnose infection. In secondary bacterial peritonitis ascitic fluid PMN count is >250 cells/mm^3 and multiple organisms are detected. Two of following ascitic fluid findings should also be present for diagnosis of secondary peritonitis. (1) Glucose <50mg/dl (2) Ascitic fluid protein >1gm/dl (3) Lactate dehydrogenase more than upper limit for normal for serum. These patients should undergo immediate flat and up right abdominal x-ray and abdominal CT.

Diagnostic yield is increased from 40 to 80% if ascitic fluid is inoculated in blood culture bottle at bed side[8]. Blood culture should also be sent as the same time as this may be positive in 50% of patients with SBP[9]. Empirical therapy with cefotaxime 2gm IV 12 hourly for 05 days is commonly used[10]. Ceftriaxone is also equally effective[11]. Amoxycillin / Clavulanic acid, fluroqinolone or piperacillin/tazobactum are alternative drugs. If on second tap done after 48 hours, PMN count does not drop less than 25% from baseline antibiotic should be changed[12,13]. Albumin at dose of 1.5g/kg on day 1 and 1g/kg on days 3 with antibiotic improves survival rate in patients with renal impairment[14]. Renal failure is a independent predictor of mortality in SBP patients[15]. Patients having ascitic fluid protein <1g/dl, recurrence rate is 70% for SBP. Oral norfloxacin 400mg daily or oral ciprofloxacin 500mg daily are recommended in these patients[17]. Patients admitted with GIT bleeding are also at risk for developing SBP. For these patients norfloxacin 400mg bd or injection ceftriaxone 1gm iv od for seven days is recommended.Intermittent use of ciprofloxacin is associated with quinolone resistant organism[18]. Data supporting the use of trimethoprim/ Sulphamethaxazole are week[19].and side effects are dangerous[20].

MATERIAL AND METHODS:

This prospective study was conducted at department of medicine Peoples University Medical & Health Science Nawabshah from January 2013 to December 2015. A total of 102 already diagnosed patients of cirrhosis with ascites admitted in all three medical units during this period were studied. There were 53 male and 49 female and their age ranged from 30 to 70 years. Diagnosed of cirrhosis was based on clinical features, laboratory findings, sonographic appearance and liver biopsy. Patients who received antibiotics during preceding week were excluded from study. All patients under went diagnostic paracentesis after admission. Material used for paracentesis was disposable syringe, culture bottle and procedure tray. Procedure was explained to the patients and his or her consent was obtained. After cleaning skin with povidone-iodine solution, aspiration of peritoneal fluid was performed in right iliac fossa. About 20 to 30ml fluid was aspirated. 10 ml of ascitic fluid was immediately inoculated into blood culture bottle at bedside and sent to pathology department culture, remaining fluid was sent for detailed report. Bleed

culture bottles containing brain heart infusion broth were incubated at 37°C. Subculture were made from turbid bottles on blood agar and mac conkeys agar plates and incubated at 37°C. Organism were identified according to morphology of grown colonies and biochemical tests. Anti microbial sensitivity testing was performed using diffusion technique. At the same time blood sample was sent for LFT, PT serum albumin, Blood CP, Blood urea, sugar and serum creatinine.

Immediately after paracentesis antibiotic treatment was started. Cefotaxime, ceftriaxone, were used in these patients. Antibiotic were adjusted according to serum creatinine level and micro organism sensitivity. Cure of SBP was established when fever, abdominal pain and tenderness disappeared and ascitic fluid count decreased below 250 cells/ mm^3.

RESULT:

A total of 102 patients were studied. Among these 53 (52%) were male and 49 (48%) were female. Their age ranged from 30 to 70 year (mean 50 years).

According to Pugh's modification of child's classifications 51 patients (50%) belong to group A, 17(16.6) patients belonged to group B and 34(33.3%) patients belonged to group C. According to diagnostic criteria 27(26.5%) patients developed SBP. Among patients with SBP and CNNA there were higher levels of peripheral blood WBC count, raised serum bilirubin, low ascitic fluid protein and prolonged prothrombin time. Blood urea and serum creatinine were also higher in these two groups In 9 patients of SBP gram negative bacilli accounted for 80% of isolates and gram positive cocci for 10% of isolates. Gram positive organism was isolated in one case of MNB. According to pugh modification of child's classification all 27 patients of SBP belonged to group C. overall mortality was 55% during hospitalization in SBP patients. Causes of death were hepatic failure, gastro intestinal bleeding, septicemia and renal failure.

Table-1: Clinical Features of Patients with SBP. (n=72)

Clinical Feature	Present No. of Patients	%
Fever	18	69
Chills	3	12
Abdominal Pain	20	75
Abdominal Tenderness	13	50
Ileus	12	44
Jaundice	10	37
Encephalopathy	13	50
Hypotension	3	12.5

DISCUSSION:

Results of this prospective study showed that out of 102 patients' cirrhosis with ascites, 27% of the patients were having SBP. 8.9% were having classical SBP, 16.7% CNNA and 0.9% MNB. This 27% figure of prevalence lies within range of 8-30% in CLD patients with ascites reported in many studies[21,25-27].

Patient with high serum bilirubin, low ascitic fluid protein and prolonged prothrombin time indicating severe liver disease were at risk to develop SBP. Our findings are in line with reported data[22].

Diuretic use in cirrhotic patients with ascites increases ascitic fluid level of total protein, complement level and opsonic activity of ascitic fluid. This is due to fluid loss in urine and it may prevent occurrence of SBP[23]. Mortality associated with SBP ranges from 10-50 %[19].

Early treatment with 3rd generation cephalosporin cefotaxime or ceftriaxone can reduce mortality.

Resistance to 3rd generation cephalosporin is also reported[30-31]. Carbapenem can be used as first line drug which covers all expected and multiresistent bacteria in patients with nosocomial SBP[24].

Table-2: Ascitic Fluid Data of Patients with Various Types of Ascites (n=102)

Parameter	SA (Sterile Ascites)	Classical SBP	CNNA (Culture Negative Neutrocytic Ascites)	MNB P-value (Monomicrobial Nonneutrocytic Bacterascites)
No of patients	75	09	17	01
Ascitic Fluid protein g/dl	2.1±0.22	1.61±0.48	1.50±0.45	2.2±0.42
Ascitic Fluid PMN cells per mm^3	63±23	1471±1901	1420±1704	57±21

Table-3: Causative Organisms of SBP

Organism	SBP No. 9	MNB No. 1
Escherichia coli	6 (60%)	0
Klebsiela	2 (20%)	0
Streptococuss	1(10%)	0
Staphylococcus	0	1(10%

Table-4: Result of Ascitic Fluid Examination (n=102)

Type	No. of Patients	%
Classical SBP	09	33.3
CNNA	17	63.0
MNB	01	3.7
SBP	27	100

Patients with low ascitic protein are at risk of recurrence of SBP. Recurrence rate is up to 70% at 1 year[28,29]. Antibiotics used for secondary prevention reduce risk of SBP from 68 to 20%[16]. For these reasons norfloxacin 400mg/d or ciprofloxacin 500 mg/d or laevofloxacin 250 mg/d are recommended. Due to risk of antimicrobial resistance with intermittent dosing, daily dosing is preferred.

CONCLUSION:

SBP is common complication of cirrhosis with ascites. SBP is associated with high mortality. Clinician should have a high index of suspicion for this complication. Whenever a patient of cirrhosis with ascites is admitted with fever, abdominal pain or hepatic encephalopathy he should undergo diagnostic paracentesis to rule out SBP. Culture positivity is low and ascitic fluid PMN count is sufficient to diagnose SBP.

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