Research Article

Spontaneous Bacterial Peritonitis in Cirrhotic Patients with Ascites

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Abstract
Purpose: Determine the frequency of spontaneous Bacterial peritonitis (SBP), its clinical profiles in cirrhotic patients with ascites, the current causative agents of SBP and their antibiotic sensitivity. **Materials and methods:** A cross-sectional study was designed to enroll two hundred and forty patients with liver cirrhosis and ascites who were admitted to the Tropical Medicine Department in El-Minia University Hospital during the period from April 2013 to April 2015. Patients were 146 male and 49 female divided into 2 groups. All patients in this study were subjected to; full history taking, thorough clinical assessment, laboratory investigations (complete blood picture, liver function tests, prothrompin time and concentration, renal function tests and, abdominal ultrasonography, ascitic fluid analysis (chemical and bacteriological examination), culturing of ascitic fluid directly on blood culture bottles andantibiotic sensitivity testing was done using Kirby-Bauer disc diffusion method
Results: The frequency of spontaneous bacterial peritonitis was (20%); Classical SBP was (88%), Culture-negative neutrocytic ascites (CNNA) was (8%) and Monomicrobial non-neutrocytic bacterascites (MNBA) was (4%). (52%) of SBP patients had gram negative organisms and the remaining (48%) had gram positive organisms.**Conclusions:** The frequency of SBP in our locality is (20%)**,** Gram-negative organisms are still the prevalent microorganisms causing SBP but there is a recent increase inGram-positive pathogen**.**
Key Words: Bacterial peritonitis, Tropical Medicine**,** microorganism

Introduction
SBP is the most common form of infection seen in patients with cirrhosis[(1)].It is requiring prompt recognition and treatment. It is defined by the presence of >250 polymorphonuclear cells (PMN)/mm^3 in ascites in the absence of an intra-abdominal source of infection or malignancy[(2,3)]

The infection occurs following a translo-cation or haematogenous dissemination of the intestinal flora. Intestinal bacterial overgrowth can also exacerbate the condition[(4)]**.**

Aerobic gram-negative bacteria, such as *Escherichia coli,* are the most commonly found pathogens in SBP[(5).]

Some studies suggest that the type and the etiology of SBP have been changing in the recent years, with increasing the frequency of gram-positive bacteria and of multiple antibiotic resistant bacteria[(6)]

As a result of the reported recent changes in epidemiology of bacteria causing SBP, the choice of antibiotics for SBP treatment and prophylaxis is evident [(6)]**.**

Based on EASL guidelines, third-generation cephalosporins (including cefotaxime and ceftriaxone) are recomm-ended as the first-line therapy[(7)]. However, knowledgeabout the local epidemiological pattern of antibiotic resistance would be necessary for an effective treatment[(8)]**.**

Patients and Methods
This study included two hundred and forty patients with liver cirrhosis and ascites. Patients were 146 male and 49 female divided into 2 groups: Group I: included 48

patients with SBP, Group II: included 192 patients with non SBP. Patients in group I (SBP) had mean age of 57.1±10.7 years Patients in group II (non-SBP) had mean age of 54.5±8.7 years.

Exclusion Criteria:
Patients with ascites due to any cause other than liver cirrhosis, and patients with localized ascites, History of receiving antibiotics ten days prior to hospital admission, or history of receiving anti-biotics as a prophylaxis, Those with secondary peritonitis or with the possibility of super-added secondary peritonitis as ulcerated leaking umbilical hernia, Hepatocellular carcinoma or malignant ascites, Alcoholic patients and diabetic patients.

All patients in this study were subjected to; full history taking, through clinical assessment, laboratory investigations (complete blood picture, liver function tests, prothrompin time and concentration, renal function tests and, abdominal ultrasonography and ascitic fluid analysis (chemical and bacteriological examination), culturing of ascitic fluid directly on blood culture bottles Antibiotic sensitivity testing (according to CLSI guidelines) was done for every isolate using Kirby-Bauer disc diffusion method

Results

Forty eight patients were diagnosed as spontaneous bacterial peritonitis was (20%); Classical SBP in 42 patients (88%), Culture-negative neutrocytic ascites (CNNA) in 4 patients (8%) and Mono-microbial non-neutrocyticbacterascites (MNBA) in 2 patients (4%).

There was insignificant difference in demographic characteristics (age and sex) of patients in both groups (Table 1, and Figure 3). Patients in group I (SBP) had the mean age of 57.1±10.7 years; 68.8% of them were male and 31.2% were female. Patients in group II (non-SBP) had the mean age of 54.5±8.7 years; 58.9% of them were male and 41.1% were female.

Table (1): Demographic characteristics of patients in both groups

Demographes	Group I (n=48)	Group II (n=192)	P-value
Age (years)	57.1±10.7	54.5±8.7	0.09
Sex:			0.20
-Male	33 (68.8%)	113 (58.9%)	
-Female	15 (31.2%)	79 (41.1%)	

There was insignificant difference in etiology of liver cirrhosis in both groups (Table 2). In group I (SBP), the etiology was hepatitis C in 95.8% and hepatitis B in 4.2%. In group II (non-SBP), the etiology was hepatitis C in 97.4% and hepatitis

Table (2): Etiology of liver cirrhosis in both groups

Etiology	Group I (n=48)	Group II (n=192)	P-value
Hepatitis C	46 (95.8%)	187 (97.4%)	0.56
Hepatitis B	2 (4.2%)	5 (2.6%)	

The clinical findings of patients with SBP had significantly high frequencies of jaundice (73%), fever (65%), hepatic encephalopathy (60.4%), GIT bleeding (52%), abdominal pain (50%), and abdominal tenderness (40%),

There was significant increase in total bilirubin, peripheral total leucocytic count and blood urea and serum creatinine levels in patients with SBP.

Among patients with SBP, there were 44 of SBP patients (91.6%) with positive culture of their ascitic fluid, 23 (52%) of these patients had gram negative organisms and the remaining 21 (48%) had gram positive organisms.

Discussion

In the present study, the frequency of SBP was 20%. This is correlates with a local study by El-Bendary et al., where the authors performed diagnostic paracentesis in 215 cirrhotic patients with ascites, and the frequency of SBP was 25.02%.[9] A Croatian study showed that frequency of SBP was 21%.In a study from Iran, demonstrated that SBP frequency was (24.33%). In contrary to us **a study** from Nigeria reported SBP in 21 out of 31(67.7%) cirrhotic patients[3]

In a study from India, out of 100 cirrhotic patients with ascites, 58% were SBP cases and 42% were non-SBP cases[11], the high prevalence was due to Alcoholism (84.48%) which was the commonest etiology in SBP cases.

Other probable reasons for higher prevalence may be late referral to the tertiary care hospital, low socio economic conditions and malnutrition, advanced stage of disease at the time of presentation, weak immune system and non-compliance to the therapy**.**

The etiological pattern of peritonitis varied in different geographical regions[12] In the present study**.,** 23 (52%) patients with positive culture had Gram negative and 21 (48%) had Gram positive pathogens

In the study by Heo et al., Gram negative organisms accounted for 81.8% of all isolated organisms (54 of 66 cases). E-coli was the most frequently isolated organism (32 of the 66 cases, 48.5%), followed by Klebsiellapneumoniae (13 cases, 19.7%) and Aeromonas species (4 cases, 6.1[1]

In a recent study by Bibi et al., similar findings were reported confirm that Gram negative bacilli were the most common causative pathogen which isolated from 85% of culture positive cases with E-coli being the leading pathogen associated with SBP followed by Enteroccocus species in 11 cases (16.7%).[13]

Our findings are in agreement with some recent reports that have shown a trend to a high frequency of Gram-positive bacterial infections in SBP cases[14,12]

Recent studies suggested an increasing trend in infections caused by gram-positive cocci in cirrhotic patients with ascites [6,4]. This is often due to some antibiotic prophylaxis or previous intervention[15]. The high rate of Gram-positive cocci had been attributed (by previous investigators) to the increasing number of invasive procedures and treatments of cirrhotic patients in intensive care units[5]**.** There is growing evidence by many studies that the detection of *Staphylococcus* spp. in the ascitic fluid is not because of sample contamination but because of bacterial translocation[16]**.**In our study increasing frequency of invasive procedures (repeated paracentesis, upper endoscopies), repeated hospitalization, may promote the increasing the frequency of Gram-positive bacteria and this explained by increase the incidence of infections caused by (coagulase –ve staph).

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