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RESEARCH ARTICLE

SPONTANEOUS ASCITIC FLUID INFECTION IN LIVER CIRRHOSIS: BACTERIOLOGICAL PROFILE AMONG PATIENTS ADMITTED IN A TERTIARY CARE HOSPITAL, MYSORE

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ABSTRACT

Background: Spontaneous ascitic fluid infection (SAI) is an acute infection of ascitic fluid. SAI has three subtypes; SBP, CNNA, MNB. The prototype is Spontaneous bacterial peritonitis (SBP). SBP is a frequent and serious complication in patients with cirrhosis leading to significant mortality and morbidity. Diagnosis of SBP is mainly established by elevated polymorphonuclear leukocyte count and positive ascitic fluid bacterial culture.

Methodology: Records of patients with suspected diagnosis of Spontaneous ascitic fluid infection were analyzed in the present study. Patients admitted in the last one year i.e., between January 2014 to December 2014 with ascites secondary to cirrhosis were included. All patients with decompensated cirrhosis had undergone ascitic fluid paracenetesis after admission to the hospital. Ascitic fluid was centrifuged and analyzed for Total protein, Albumin, Total and Differential leukocyte count. Ascitic fluid was cultured by using BacTec method to determine the growth of microorganism. Antimicrobial test was performed using disc diffusion method. The data were tabulated and analyzed using SPSS version 16.0.

Conclusion: SAI was detected in 15.7% of the patients. The most common organism isolated was enteric gram negative bacilli. The leading cause of cirrhosis among patients admitted was alcohol consumption

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INTRODUCTION

Spontaneous ascitic fluid infection (SAI) is an acute infection of ascitic fluid. SAI has three subtypes. The prototype is Spontaneous bacterial peritonitis (SBP). SBP is a frequent and serious complication in patients with cirrhosis contributing to significant mortality and morbidity.[1]The other two subtypes are CNNA and MNB. Diagnosis of SBP is made when there is a positive ascitic fluid culture and an elevated ascitic fluid absolute PMN count (i.e., atleast 250 cells/mm3) without evidence of an intra-abdominal surgically treatable source of infection[2].Knowledge regarding the spectrum of organism causing SBP and their antibiotic susceptibility influences clinical outcomes. Hence an attempt was made through the present study to assess bacteriological profile of patients admitted with SAI.

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MATERIALS AND METHODS

Records of patients with suspected diagnosis of Spontaneous ascitic fluid infection were analyzed in the present study. Patients admitted in the last one year i.e., between January 2014 to December 2014 with ascites secondary to cirrhosis were included. All patients with decompensated cirrhosis had undergone ascitic fluid paracenetesis after admission to the hospital. Ascitic fluid was centrifuged and analyzed for Total protein, Albumin, Total and Differential leukocyte count. Ascitic fluid was cultured by using BacTec method to determine the growth of microorganism. Antimicrobial test was performed using disc diffusion method. The data were tabulated and analyzed using SPSS version 16.0.

RESULTS

A total of 300 patients were enrolled for the present study. The mean age of the patients admitted was 49.35 yrs (SD: 1.55).

79.7% (239 subjects) were males, 20.3% (61 subjects) were females.

Table 1. Distribution of study participants according to the presenting complaints

Presenting complaints	Frequency	Percentage
Abdominal distension	294	98.0
Pedal oedema	150	50.0
Abdominal pain	85	28.3
Fever	75	25.0
Decreased urine output	71	23.7
Loose stools	34	11.3

Table 1 shows the proportion of presenting complaints with which the liver cirrhosis patients were admitted to hospital. The major complaint was abdominal distension (98.0%) followed by pedal oedema (50.0%).

Table 2. Distribution of study participants according to etiological factors of Cirrhosis

Aetiology	Frequency	Percentage
Alcohol intake	244	81.3
Hepatitis B	39	13.0
NAFLD	6	2.0
Autoimmune	3	1.00
Hepatitis C	1	0.33
Budd chairi	1	0.33
Wilson's disease	1	0.33

Table 2 shows the distribution of aetiological factors among the study participants. Majority of the patients (81.3%) had the history of alcohol intake followed by hepatitis B infection.

Table 3. Distribution of study participants according to clinical & lab characteristics of patients with SAI

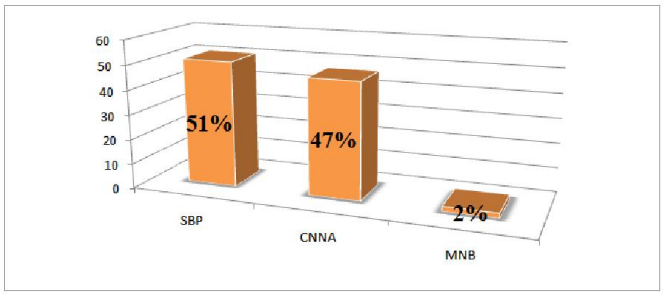
Clinical & lab characteristics	Frequency (%)
Renal failure	19 (41.3)
Hepatic encephalopathy	18 (39.1)
Variceal bleeding	8 (17.4)
White blood cell count at admission: Median (IQR)	9195(6050-14337)
Child-pugh class(A/B/C)	0/7/40
MELD score Median (IQR)	19(9-29)

Table 3 shows the clinical and laboratory characteristics of patients admitted with liver cirrhosis. 41.3% of the patients had renal failure, 39.1% had hepatic encephalopathy and 17.4% of them had variceal bleeding. The average white blood cell count was 9195(6050-14337) at the time of admission, average Child-Pugh class was (0/7/40) and the MELD score 19(9-29).

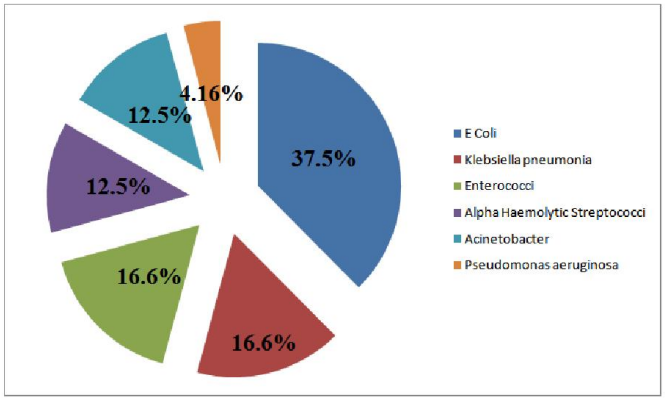
Table 4. Ascitic fluid analysis in Spontaneous ascitic fluid infection patients

Total protein (mg/dl)	1.12(0.90-1.91)
Cell count (cells/mm^3)	650 (300-9500)
PMN count (cells/mm^3)	350 (250-10,000)

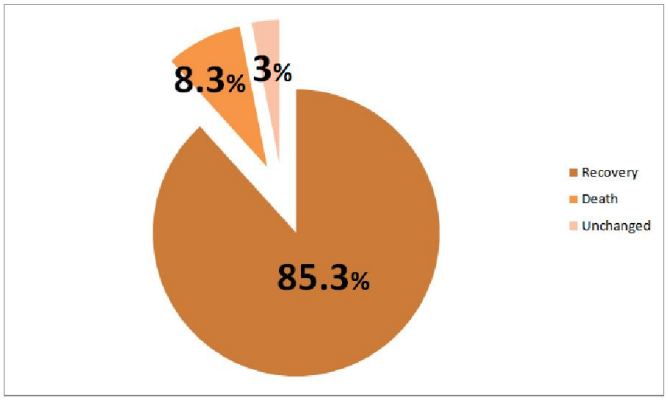
Graph 1 shows that, majority of the study participants had SBP 24 (51%), 22 CNNA (47%), MNB 1 (2%). Graph 2 shows the distribution of participants according to type of organism involved. Majority of the patients showed E.Coli organism (37.5%) followed by Klebsiella pneumonia (16.6%) and enterococci (16.6%). Graph 3 shows the distribution of patients according to outcome of the patients. 85.3% of the patients showed recovery, 8.3% died and in 3% of the cases the status remained unchanged.



Graph 1. Distribution of study participants according to type of SAI



Graph 2. Distribution of participants according to type of organism isolated



Graph 3. Distribution of patient's according to outcome of the patients

DISCUSSION

Forty sevenpatients (15.7%) had SAI, out of which (51%) had spontaneous bacterial peritonitis (SBP), (47%) culture-negative neutrocytic ascites (CNNA), and (2 %) monomicrobial non-neutrocytic bacterascites (MNB). Gram-negative bacilli (E. coliand Klebsiella) were the commonest organisms. The most prevalent isolated pathogen was *E. coli*

(37.5%), followed by *klebsiella* (16.6%) and *Enterococcus* (16.6%). The overall prevalence of SBP in hospitalized patients is 10%-30%, and directly correlated with the severity of liver disease. The prevalence trend observed in the present study is in concordance with available data. *E. Coli, S. aureus* and klebsiella were also implicated as the most common pathogens causing SBP in other studies conducted in Asia.[3]

Few of the studies have noted a predominance of gram-positive organisms in ascitic fluid cultures – this fact may be explained on the basis that they used a BACTEC plus aerobic and anaerobic bottles culture system (Dalmau *et al*., 1999). The low rate of culture positivity in other studies can be attributed to prior antibiotic administration to the patients. These are the results of some of the similar studies conducted to study the bacteriological and clinical profile of the patients admitted with SAI with cirrhotic ascites. Spontaneous bacterial peritonitis (SBP) in cirrhotic ascites: A prospective study conducted by Syed *et al*. (2007) in a tertiary care hospital, Nepal, prospectively evaluated 81 cirrhotic patients with ascites during one-year period. Of these 81 patients, 24.67% of patients (n=20) had SAI and its variants (classical SBP n= 4, CNNA n=13and bacterascites n=3).

There were thirteen males and 7 females in the study.85% of the cases had Child`s class C cirrhosis. UGI bleeding and abdominal pain was the most common presenting symptoms of SBP. Culture positives were 35% (n=7). The most frequent organisms were *Escherichia coli* (n=3) and S*treptococcus pneumoniae (*n=2). 94% of the patients responded to therapy after 48 hours of treatment. A study conducted on patients with alcoholic cirrhosis with ascites by Gill *et al*. (2012) in Ludiana showed that, 24% patients reported with SBP, and the mean MELD score in this group of patients was significantly more as compared to other cirrhotic patients. Using the appropriate diagnostic criteria, the classic SBP was the most common presentation in SBP. A study of bacteriological profile of ascitic fluid in suspected clinical cases of spontaneous bacterial peritonitis at a tertiary care hospital in India by Purohit *et al*. (2015) Of 217 clinically suspected cases of SBP, 71 (43.80%) had ascitic fluid polymorphonuclear cells (PMN)count ≥ 250/mm3. Among 71 cases, 31 (43.6%) cases were culture positive and 40 (56.4%) cases were culture-negative neutrocytic ascites. From 31 culture-positive cases, *E. coli* was isolated from 17 (54.9%) cases; *Klebsiella spp*. was isolated from 5 (16.2%) cases; *Staphylococcus aureus* was isolated from 6 (19.3%) cases; and *Pseudomonas aeruginosa*was isolated from 3 (9.6%) cases. All isolates were sensitive to cefotaxime and ceftriaxone. Spontaneous ascitic fluid infection in liver cirrhosis: bacteriological profile and response to antibiotic therapy, a study conducted by Bhat *et al*. (2013) showed the following results.Seventy patients (11.6 %) had SAI, including 40 (57.1 %) culture-negative neutrocytic ascites (CNNA), 25 (35.8 %) spontaneous bacterial peritonitis (SBP), and five (7 %) monomicrobial non-neutrocytic bacterascites (MNB). Gram-negative bacilli (Klebsiella and E. coli) were the commonest organisms. The overall response rate to ceftriaxone was 62.8 % (44/70). Among culture-positive patients (SBP and MNB), sensitivity rates to ceftriaxone was 50 %, while it was 53.3 % for quinolones, 70 % for piperacillin–tazobactam, and 93.3 % for cefoperazone–sulbactam combination. Thirty-day mortality was lower for CNNA compared to SBP (20 % vs. 40 %, $p < 0.001$) and for patients with response compared to no response to first antibiotic (11.3 % vs. 53.8 %, $p < 0.001$).

Conclusion

- SAI was detected in 15.7% of the patients.
- The most common organism isolated was enteric gram negative bacilli (E Coli).
- The leading cause of cirrhosis among patients admitted was alcohol consumption.

REFERENCES

Bhat, G., Vandana, KE., Bhatia, S., Suvarna, D. and Pai, CG. 2013. Spontaneous ascitic fluid infection in liver cirrhosis: bacteriological profile and response to antibiotic therapy. *Indian J Gastroenterol*., 32(5):297-301.

Sheikhbahaei, S., Abdollahi, A., Hafezi-Nejad, N. and Zare, E. 1981. Patterns of Antimicrobial Resistance in the Causative Organisms of Spontaneous Bacterial Peritonitis: A Single Centre, Six-Year Experience of Samples. *International Journal of Hepatology*.

Jain, AP., Chandra, LS., Gupta, S. *et al*. 1999. Spontaneous Bacterial Peritonitis in liver cirrhosis with ascites. *J Assoc physicians India*, 47 (6): 619-621.

Dalmau, D., Gilles Pomier, L., Fenyves, D., Willems, B., Turgeon, F. and Turgeon, P. 1999. Cefotaxime, Desacetyl-Cefotaxime, and Bactericidal Activity in Spontaneous Bacterial Peritonitis. *The Journal of Infectious Diseases*, 180:1597–602.

Syed, VA., Ansari, JA., Karki, P., Regmi, M. and Khanal, B. 2007. Spontaneous bacterial peritonitis (SBP) in cirrhotic ascites: Aprospective study in a tertiary care hospital, Nepal. *Kathmandu University Medical Journal*, 5(1) issue17:48-59.

Gill, A. S., Singh, A., Matreja, P. S., China, R. A., Mahajan, R. and Chhina, D. K. 2012. Spontaneous bacterial peritonitis in alcoholic cirrhosis: An Indian perspective. *Euroasian Journal of Hepato-Gastroenterology*, 2(1):14-19.

Purohit, P. H., Malek, S. S., Desai, K. J. and Sadadia, M. 2015. A study of bacteriological profile of ascetic fluid in suspected clinical cases of spontaneous bacterial peritonitis at a tertiary care hospital in India. *International Journal of Medical Science and Public Health*, 4(4).

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