

Harsukh Educational Charitable Society

International Journal of Community Health and Medical Research

Journal home page: www.ijchmr.com

doi: 10.21276/ijchmr

Official Publication of "Harsukh Educational Charitable Society" [Regd.]

ISSN E: 2457-0117

ISSN P:2581-5040

RNI No. - PUNENG/2017/75049

Index Copernicus value 2016 = 52.13

Original Article

Evaluation Of Various Risk Factors For Spontaneous Ascites Fluid Infection In Cirrhosis Patients Planned To Undergo Therapeutic Paracentesis: A Clinical Study

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ABSTRACT:

Background: Spontaneous bacterial peritonitis (SBP) is a severe complication in cirrhotic patients with ascites. Hence; we planned the present study to assess various risk factors for spontaneous ascites fluid infection in cirrhosis patients planned to undergo therapeutic paracentesis. **Materials & method:** We planned the present study to assess various risk factors for spontaneous ascites fluid infection in cirrhosis patients planned to undergo therapeutic paracentesis. A total of 100 cirrhosis patients planned to undergo therapeutic paracentesis were included in the present study. Therapeutic paracentesis was carried out in all the patients. Collection of Ascitic fluid was done under septic conditions. Examination of the Ascitic fluid was done for assessing the leucocyte count, protein and albumin levels. Diagnosis of Spontaneous bacterial peritonitis (SBP) was done on the basis of positive Ascitic fluid culture and an elevated ascitic fluid absolute polymorphonuclear count. All the results were analyzed by SPSS software. **Results:** The prevalence of Ascitic fluid infection in the present study was 2 percent. Positive culture was found to be present in three out of four patients with positive Ascites infection. Mean age of the patients with and without Ascitic fluid infection was found to be 50.5 and 48.2 years respectively. Mean serum albumin levels and Ascitic fluid protein levels among patients with Ascitic fluid infection were found to be 3 and 1.15 g/dL respectively. **Conclusion:** In patients undergoing therapeutic paracentesis, occurrence of spontaneous Ascitic fluid infection is significantly infrequent, along with absence of any major risk factors.

Key words: Ascites, Cirrhosis, Spontaneous bacterial peritonitis

This article may be cited as: Verma J Evaluation Of Various Risk Factors For Spontaneous Ascites Fluid Infection In Cirrhosis Patients Planned To Undergo Therapeutic Paracentesis: A Clinical Study . HECS Int J Comm Health Med Res 2018;4(2):54-57

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INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is a severe complication in cirrhotic patients with ascites. The risk of SBP seems related to abnormalities in host defense. Patients who have low protein content, low C3 concentrations, and low ascitic fluid (AF) opsonic activity appear to be at higher risk for the development of SBP. It is generally accepted that SBP is a consequence of bacteremia, which is probably facilitated by low depressed reticuloendothelial system phagocytic activity⁶ and

serum complement deficiency.^{1- 3} Ascites may develop from a variety of causes including cirrhosis, malignancy, tuberculosis,

Budd–Chiari syndrome, or congestive heart failure (CHF). Liver cirrhosis accounts for nearly 85% of cases of ascites. In cirrhosis, portal hypertension (PHTN) is the necessary predecessor to the development of ascites.^{4- 6} Alongside portal hypertension, additional changes occur that lead to the development of ascites.⁷ Hence; we planned the present study to assess various risk

factors for spontaneous ascites fluid infection in cirrhosis patients planned to undergo therapeutic paracentesis.

MATERIALS & METHOD

We planned the present study in the department of Gastroenterology of the medical institute and it included evaluation of various risk factors for spontaneous ascites fluid infection in cirrhosis patients planned to undergo therapeutic paracentesis. For the present study, we obtained ethical approval from the ethical committee of the institution. We also obtained written consent from the entire patient after explaining in detail the entire research protocol. A total of 100 cirrhosis patients planned to undergo therapeutic paracentesis were included in the present study. Inclusion criteria for the present study included:

- Liver cirrhosis patients scheduled to undergo therapeutic paracentesis,
- Patients with any other hepatic pathology,
- Patients with gastric ulcers,
- Patients with history of any other systemic illness

Both biochemical and imaging findings were used as criteria for diagnosis the patients with liver cirrhosis. Complete demographic and clinical details of all the subjects were recorded. For evaluation of severity of diseases, Child-Pugh score was used.⁸ Therapeutic paracentesis was carried out in all the patients. Collection of Ascitic fluid was done under septic conditions. Examination of the Ascitic fluid was done for assessing the leucocyte count, protein and albumin levels. Diagnosis of Spontaneous bacterial peritonitis (SBP) was done on the basis of positive ascitic fluid culture and an elevated ascitic fluid absolute polymorphonuclear count.⁹ Hospitalization of patients with SBP was done and intravenous cefotaxime was started and continued for five days. Follow-up for all the patients was done for confirming the complete resolution of infection. All the results were analyzed by SPSS software. Chi-square and univariate regression curve were used for assessment of level of significance. P- value of less than 0.05 was taken significant.

RESULTS

In the present study, we evaluated a total of 100 liver cirrhosis patients. Positive Ascitic fluid infection was found to be present in 4 patients. Hence; the prevalence of Ascitic fluid infection in the present study was 2 percent.

Table 1: Demographic and clinical details of patients with ascites infection

S No.	Age	Child-Pugh Score	Culture	Serum albumin (g/dL)	Ascitic fluid protein (g/dL)
1	49	B	Negative	2.8	1

2	52	B	Positive	2.9	1.1
3	53	C	Positive	3.2	1.3
4	48	C	Positive	3.1	1.2

Graph 1: Serum albumin levels and Ascitic fluid protein levels among patients with Ascitic infection

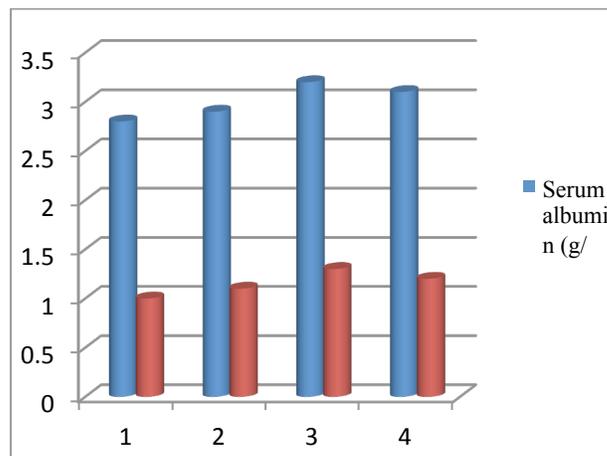


Table 2: Risk factors for asymptomatic Ascitic fluid infection in cirrhosis

Parameter	Ascitic fluid infection	
	Present (n=4)	Absent (n=96)
Mean age (years)	50.5	48.2
Gender	Males	3
	Females	1
Serum albumin levels (g/dL)	3	2.8
Ascitic fluid protein (g/dL)	1.15	1.1

Positive culture was found to be present in three out of four patients with positive Ascites infection as shown in **Table 1** and **Graph 1**. Mean age of the patients with and without Ascitic fluid infection was found to be 50.5 and 48.2 years respectively. Male predominance was found among patients with positive Ascitic fluid infection. Mean serum albumin levels and Ascitic fluid protein levels among patients with Ascitic fluid infection were found to be 3 and 1.15 g/dL respectively as shown in **Table 2**.

DISCUSSION

The term spontaneous bacterial peritonitis (SBP) was coined by Harold Conn in the early 1970s to describe the infection of ascitic fluid in the absence of any intra-abdominal, surgically treatable source of infection.^{6, 7}In the present study, the prevalence of Ascitic fluid infection in the present study was 2 percent. Positive

culture was found to be present in three out of four patients with positive Ascites infection. Male predominance was found among patients with positive Ascitic fluid infection. Mean serum albumin levels and Ascitic fluid protein levels among patients with Ascitic fluid infection were found to be 3 and 1.15 g/dL respectively. Romney R et al evaluated the prevalence of spontaneous bacterial peritonitis and culture-negative neutrocytic ascites in a large population of consecutive asymptomatic cirrhotic ambulatory patients. Sixty-seven cirrhotic patients (48M/19F, mean age 59 +/- 9 years) had 270 therapeutic paracenteses, preceded by an exploratory aspiration. The mean number of paracenteses was 5 +/- 4.3 per patient; 59.6% of the paracenteses (161) were compensated with human albumin. Ascitic protein concentration was 17.5 +/- 8.6 g/l, ascitic fluid cell count and number of neutrophils were 127 +/- 155/mm³ and 5.9 +/- 14/mm³ (0-60), respectively. No patient had spontaneous bacterial peritonitis nor culture-negative neutrocytic ascites; 10 cases of monomicrobial bacterascites were observed, all with commensal germs. In the absence of obvious signs of infection, the prevalence of spontaneous bacterial peritonitis and culture-negative neutrocytic ascites in asymptomatic cirrhotic outpatients with ascites is near 0%.¹⁰

Castellote J et al investigated spontaneous bacterial peritonitis and bacterascites prevalence in a prospective cohort of cirrhotic outpatients following large-volume paracentesis with low risk of infection. Patients with fever, abdominal pain, peritonism or hepatic encephalopathy were excluded from the study. The ascitic fluid was analyzed by means of a reagent strip with a colorimetric scale from 0 to 4. A strip test of 0 or 1 was considered negative. In those cases with a reagent strip > or =2, conventional polymorphonuclear count was performed. Ascitic fluid culture was done into blood culture bottles in all cases. They performed 204 paracenteses in 40 patients. Nine cases were excluded. Culture-negative neutrocytic ascites was diagnosed in one case (0.5%), while bacterascites was diagnosed in six out of 195 cases (3%), mainly by gram-positive cocci. The spontaneous bacterial peritonitis prevalence in outpatient cirrhotics with low risk of infection undergoing large-volume paracentesis is very low. Moreover, the prevalence of bacterascites is low and without clinical consequences.¹¹ Kaymakoglu S et al investigated the prevalence of spontaneous ascitic infection (SAI) in different cirrhotic groups, the risk factors for development of SAI, and the efficacy of cefotaxime therapy. Eighty cirrhotic patients with ascites were assigned to four groups: hepatitis B or D virus-related 34, alcoholic 18, hepatitis C virus-related 14, miscellaneous 14. Paracentesis was performed on 80 patients during 92 consecutive hospitalizations. Ascitic fluid was cultured by the method of bedside inoculation of blood culture bottles with ascites. The patients with SAI were treated with cefotaxime (2 g, three times daily, intravenously) for 5 days. Twenty SAI episodes (22%) were found in 16 patients; 8 episodes were spontaneous bacterial peritonitis, 2 bacterascites, and 10 culture-negative neutrocytic ascites. SAI occurred more frequently in patients with hepatitis B or D virus-related liver cirrhosis (32%) than in the alcoholic (6%,

P < 0.05), hepatitis C virus-related (14%) or miscellaneous (14%) cirrhotic groups in multivariate analysis, independent predictive factors associated with the development of SAI are chronic hepatitis B virus infection, ascitic fluid total protein and serum bilirubin. Escherichia coli was obtained in 5 of 10 positive ascitic fluid cultures. Cure of the infection was achieved in 95% of episodes. Hospitalization mortality rate in infected patients was 20%. Spontaneous ascitic infection occurs in approximately 20% of cirrhotic patients hospitalized with ascites.¹²

CONCLUSION

From the above results, the authors conclude that in patients undergoing therapeutic paracentesis, occurrence of spontaneous Ascitic fluid infection is significantly infrequent, along with absence of any major risk factors. However, future studies with larger study group are required for better exploration of this field of gastroenterology.

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Source of support: Nil

Conflict of interest: None declared

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