Original Article

Frequency of Hepatic Hydrothorax in Patients with Liver Cirrhosis: A Tertiary Care Hospital Experience

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ABSTRACT

OBJECTIVE: Present study was designed to find out the frequency of hepatic hydrothorax among the patients with liver cirrhosis in a tertiary care hospital.

METHODS: This prospective observational study was carried out at the Hepatology Section of Department of Medicine, Isra University Hospital, Hyderabad, from December 2005 to May 2006. All the consecutive patients suffering from cirrhosis of liver were included and studied for the presence of hepatic hydrothorax. Results were summed up and test parameters were compared statistically.

RESULTS: The total number of patients was 128, and the mean age of these patients was 48.6 years. Frequency of hepatic hydrothorax in all patients with cirrhosis was 5.5% (7/128). It was seen that highest frequency of hepatic hydrothorax was found in Hepatitis C cirrhotic patients (4/7). The second most common occurrence was found in hepatitis B cirrhotic patients (2/7). In other types (non "B", non "C") it was 1/7.

CONCLUSION: The frequency of hepatic hydrothorax at our center is similar as reported in the world literature.

KEY WORDS: Hepatic Hydrothorax, Liver Cirrhosis, Hepatitis.

INTRODUCTION

Hepatic hydrothorax is a complication of advance stage chronic liver disease. It refers to the abnormal accumulation of more than 500 milliliters of transudative pleural effusion in patients with cirrhosis of liver where a cardiac and pulmonary cause of pleural effusion has been ruled out [1, 2]. Mostly this is a right sided effusion, could be bilateral and rarely it is isolated left sided effusion. Occasionally a hepatic hydrothorax may be present in the absence of ascites [3, 4]. A number of different mechanisms have been proposed to explain the development of pleural effusion in patients with cirrhosis, alteration in splanchnic circulation, elevation of nitric oxide (NO) in splanchnic circulation in cirrhotics, hypoalbuminemia, increased flow and elevated pressure in the thoracic duct and azygos veins are common in cirrhotic patients with portal hypertension and can contribute in the formation of ascites and pleural effusion.[5,6] Yet significant pleural effusion is encountered in only a limited proportion of the patients. In addition the above mechanisms fail to explain why the hydrothorax is predominantly right sided[5-7]. Pleural effusion causes early symptoms like cough, shortness of breath and hypoxemia. If contaminated with bacteria, chest pain and fever may also develop. This is referred to as spontaneous bacterial empyema (SBEM) [8, 9]. Prevalence of hepatic hydrothorax as shown in various studies is around 5% to 10% [6]. Although its prevalence as high as 12% has also been reported [6]. The purpose of this study was to know the frequency of hepatic hydrothorax at our hospital at Hyderabad, Pakistan.

PATIENTS AND METHODS

This is a prospective observational study conducted at the hepatology clinic of Isra University Hospital (IUH) Hyderabad. IUH is a 400 bed tertiary care hospital located in the outskirts of Hyderabad, the fifth largest town of Pakistan. Patients were referred to IUH for tertiary care help from both the rural and urban population of Hyderabad and nearby districts of Sindh province. Duration of study was six months, from 1st December 2005 to 31st May 2006. All the consecutive cirrhotic patients visiting hepatology clinic at Isra university hospital were enrolled in the study. An informed written consent was taken from all patients. A chest X-ray and abdominal ultrasound were carried out in all patients to find out the presence of pleural effusion. Fifty milliliters of pleural fluid was aspirated in all patients with pleural effusion using the transthoracic approach, taking ultrasound guidance wherever required. Fluid was sent for analysis of proteins, glucose, leukocyte count, Gram's stain, bacterial culture and sensitivity testing and also for acid fast bacilli (AFB) smear and culture sensitivity testing. A transudative pleural effusion was taken into account if

the protein content of the fluid was less than 2.5 gm/dl. A diagnosis of hepatic hydrothorax was excluded in exudative pleural effusion. To exclude a cardiac or pulmonary cause of pleural effusion a detailed history and thorough physical examination was performed in every patient. Electrocardiography, echocardiography and computerized tomography scan of chest was done wherever required. Serological screening tests for hepatitis C (anti HCV by ELISA) and Hepatitis B (HBsAg by ELISA) were done in all patients. Those who were non-reactive for the both above serological screening tests, labeled historically as non-B and non-C cirrhosis of liver. Modified Child-Pugh class of each patient was also noted. The aim of this study was only to document the frequency of hepatic hydrothorax in cirrhotic patients at our center and to compare this with world reported prevalence.

Statistical Analyses:

The frequency of hepatic hydrothorax was presented in percentage. The X^2 (chi-square) test and independent t-test, were used to assess the significance of difference. All the available information on each variable was used. P (probability) value of 0.05 or less was considered to indicate statistical significance.

RESULTS

A total of 128 patients were included in the study from 1st December 2005 to 31st May 2006. Out of these, 74 (58%) were males and 54 (42%) were females. Mean age was 48.6 years. Nine patients had pleural effusion. Two of them were excluded due to exudative nature of their fluid analysis. Seven patients had transudative effusion and were considered as hepatic hydrothorax as shown in **Table 1**. All patients had right sided involvement and with concomitant presence of ascites. None of the patients had left sided or bilateral pleural effusion. Ascites was present in 93 patients whereas pedal edema was seen in 81 patients. All patients with pleural effusion were suffering from either Child-Pugh class B or C cirrhosis. Out of the seven patients of hepatic hydrothorax, two were symptomatic and these two were found to have spontaneous bacterial empyema (pleural fluid total leucocytes count more than 500/cumm). These two patients had symptoms of cough, shortness of breath and fever. Four out of seven patients of hepatic hydrothorax were reactive for anti-HCV, while two were reactive for HBsAg, and remaining one was non-reactive for both the serological tests. No statistically significant difference noted when the various variables were compared with respect to the presence or absence of hepatic hydrothorax, as shown in **Table I**.

TABLE I:
COMPARISON OF CHARACTERISTICS RELATED TO HEPATIC HYDROTHORAX

	Hepatic Hydrothorax Present n (%)	Hepatic Hydrothorax Absent n (%)	P-value
Serology			0.42
Anti-HCV Positive	4 (3.1)	88 (68.8)	
HBsAg Positive	2 (1.6)	12 (9.4)	
Non-B & Non-C	1 (0.8)	18 (14.1)	
Both B & C	0(.)	03 (2.3)	
Ascites			0.095
Yes	7 (5.5)	0 (0)	
No	86 (67.2)	35(27.3)	
Pedal Edema			0.205
Yes	6 (4.7)	75 (58.6)	
No	1 (0.8)	46 (35.9)	
Child class			0.37
A	0 (0)	24 (188)	
B	4 (3.1)	64 (50)	
C	3 (2.4)	33 (25.8)	

DISCUSSION

Cirrhosis of liver and its related complications are a major health care problem of this country. However, there is no study available in our country to find out the frequency of hepatic hydrothorax in patients with liver cirrhosis. Elsewhere in the world frequency of hepatic hydrothorax is estimated to be around 5 to 10 percent[10]. Our study of 128 patients also showed a frequency of hepatic hydrothorax of 5.5%. However in our study all the cases of hydrothorax were right sided whereas the overall prevalence of right side hepatic hydrothorax is 85%[10]. This insignificant difference could be due to the small sample size of our study where we found only 7 cases of hydrothorax in cirrhotic patients in six months. Present study is comparable with study done by Kuiper et al[11]. We found that hepatic hydrothorax was seen in patients with advanced stage of cirrhosis but it was statistically not significant. Similarly the presence of ascites and pedal edema has no statistically significant impact over the presence of hepatic hydrothorax. This may be due to

the small sample size and low frequency of patients with hepatic hydrothorax. In our study the frequency of spontaneous bacterial empyema was 28.5%. This can be compared with the study of Sese et al, where they found the frequency of SBEM of 31.2% out of 48 cirrhotic patients in Spain[12]. Xiol et al, also reported a prevalence of 13% of SBEM in a study of 120 patients of hepatic hydrothorax [13]. Our study also confirmed the risk factors of low proteins in the pleural fluid and high Child-Pugh score in cases of SBEM. Present study is comparable with studies done by Emerson et al, and Albert et al, who also found a prevalence of 5.7% hydrothorax in patients with liver cirrhosis[14, 8].

CONCLUSIONS

Hepatic hydrothorax is a notably rare complication of cirrhosis of liver. Its frequency at a tertiary care hospital of Hyderabad, Pakistan is 5.5% and similar to that elsewhere in the world.

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