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Original Article

Incidence of Left Atrial Enlargement Among Liver Cirrhosis Patients: A Clinical Study

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ABSTRACT

Background: The pathogenic processes of liver cirrhosis lead to changes in cardiac structure and function. Hence, we assessed the incidence of left atrial enlargement among liver cirrhosis patients.

Materials & Methods: A total of 50 patients with liver cirrhosis were enrolled. Physical examination was concentrated to detect stigmata of chronic liver disease for underlying aetiology. Physical examination was done to look for any evidence of cardiac or renal involvement in each patient. Hematological tests were carried out in all the patients. X-ray chest and ECG was done prior to echocardiography. Transthoracic 2 D echo with Doppler was done in all patients to assess left atrial enlargement.

Results: Left atrial enlargement was found to be present in 46 percent of the patients while it was absent in 54 percent of the patients. Non-significant results were obtained while correlating the presence of left atrial enlargement with etiologic profile.

Conclusion: Derangement of cardiac functions does occur significantly in liver cirrhosis patients.

KEYWORDS: Cirrhosis, Left Atrial Enlargement, Liver.

INTRODUCTION

The pathogenic processes of liver cirrhosis lead to changes in cardiac structure and function. In these patients, the clinical manifestation of increased cardiac output and visceral blood flow, decreased systemic vascular resistance and mean arterial blood pressure, dysfunctional ventricular diastolic and/or systolic dysfunction, and mild tachycardia, as well as electromechanical abnormalities with prolonged QT interval without other known causes of cardiac disease, is defined as cirrhotic cardiomyopathy (CCM).[1-3]

The main clinical features of cirrhotic cardiomyopathy include baseline increased cardiac output, attenuated systolic contraction or diastolic relaxation in response to physiologic, pharmacologic, and surgical stress, and electrical conductance abnormalities (prolonged QT interval). In most cases, diastolic dysfunction precedes systolic dysfunction, which tends to manifest only under conditions of stress. Cardiac response to physical exercise in cirrhotic patients is blunted, with subnormal responses in echocardiographic ejection fraction and contraction time.[4-7]

Echocardiographic assessment of Left atrial (LA) size is a measurement of its anteroposterior linear dimension by M-mode or two-dimensional echocardiography in parasternal long axis view. Although this one-dimensional measurement has been shown to correlate with angiographic measurements and has been used extensively in clinical and research work, it is a less accurate and unreliable representation of the true LA size.[6,7] Hence; the present study was undertaken for assessing the incidence of left atrial enlargement among liver cirrhosis patients.

MATERIALS & METHODS

The present study was conducted in the department of general medicine of the medical institute and it included assessment of left atrial enlargement among patients with liver cirrhosis. Ethical approval was taken from the institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients with liver cirrhosis were enrolled.

Exclusion Criteria

- Patients of acute liver illness.
- Patients with chronic renal failure.
- Patients with rheumatic heart disease.
- Patients with collagen disease.
- Patients with any bleeding disorders.
- Patients having hepatocellular carcinoma/ any malignancy.

Physical examination was concentrated to detect stigmata of chronic liver disease for underlying aetiology. Physical examination was done to look for any evidence of cardiac or renal involvement in each patient. Hematological tests were carried out in all the patients. X-ray chest and ECG was done prior to echocardiography. Transthoracic 2 D echo with Doppler was done in all patients to assess left atrial enlargement.

Statistical Analysis

All the results were compiled and analyzed by SPSS software. Chi- square test and one- way ANOVA were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

In the present study, a total of 50 patients with liver cirrhosis were analyzed. Mean age of the patients of the present study was 49.5 years. 38 percent of the patients belonged to the age group of 45 to 60 years. 74 percent of the patients were males while the remaining 26 percent were females. Alcohol was the etiologic factor of liver cirrhosis in 58 percent of the patients, while Nonalcoholic steatohepatitis (NASH) was the etiologic factor in 24 percent of the patients. Hepatitis C was the etiologic factor in 10 percent of the patients.

In the present study, left atrial enlargement was found to be present in 46 percent of the patients while it was absent in 54 percent of the patients. Among 29 patients in whom alcohol was the etiologic factor for liver cirrhosis, left atrial enlargement was found to be present in 14 patients. Among the 12 patients in whom NASH was the etiologic factor, left atrial enlargement was found to be present in 5 patients. Non-significant results were obtained while correlating the presence of left atrial enlargement with etiologic profile.

Table 1: Distribution of subjects according to gender

Gender	Number of patients	Percentage
Female	13	26
Male	37	74
Total	50	100

Table 2: Distribution of subjects according to Etiology

Etiology	Number of patients	Percentage
Alcohol	29	58
NASH	12	24
Hepatitis C	5	10
Others	4	8
Total	50	100

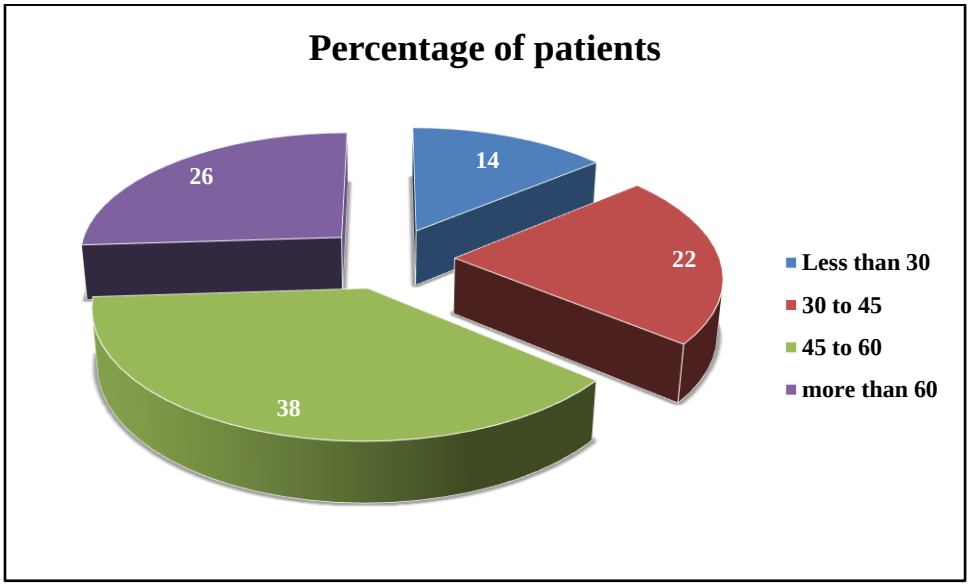
Table 3: Incidence of left atrial enlargement in liver cirrhosis patients

Left atrial enlargement	Number of patients	Percentage
Present	23	46
Absent	27	54
Total	50	100

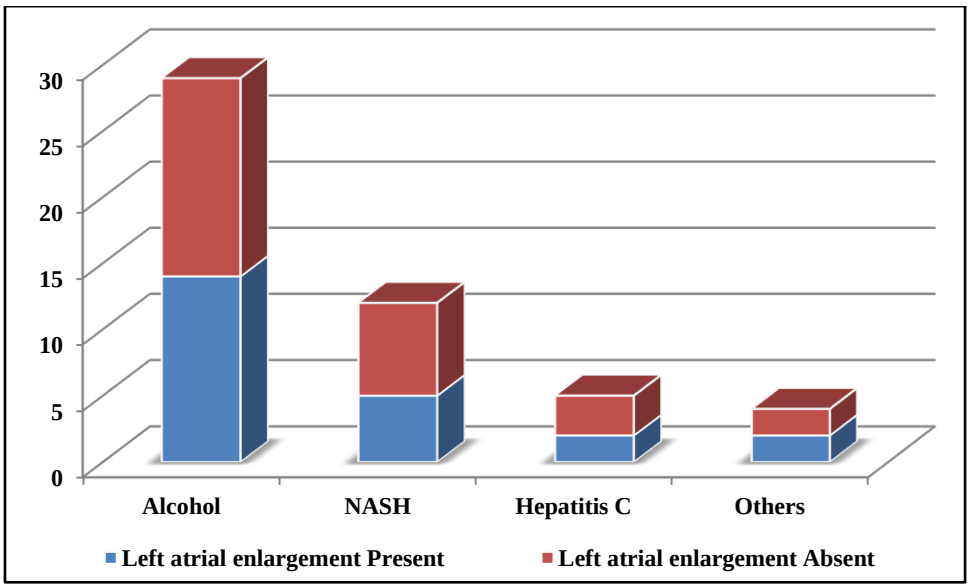
Table 4: Correlation of left atrial enlargement with etiology

Etiology	Left atrial enlargement		p- value
	Present	Absent	
Alcohol	14	15	0.99
NASH	5	7	
Hepatitis C	2	3	
Others	2	2	
Total	23	27	

Graph 1: Age-wise distribution of patients



Graph 2: Correlation of left atrial enlargement with etiology



DISCUSSION

Cirrhosis is defined as the histological development of regenerative nodules surrounded by fibrous bands in response to chronic liver injury, which leads to portal hypertension and end stage liver disease. Liver fibrosis results from the perpetuation of the normal wound healing response resulting in an abnormal continuation of fibrogenesis (connective tissue production and deposition). Fibrosis progresses at variable rates depending on the cause of liver disease, environmental and host factors. Cirrhosis is an advanced stage of liver fibrosis that is accompanied by distortion of the hepatic vasculature.[7-9] Hence; the present study was undertaken for assessing the incidence of left atrial enlargement among liver cirrhosis patients.

In the present study, a total of 50 patients with liver cirrhosis were analyzed. Mean age of the patients of the present study was 49.5 years. 38 percent of the patients belonged to the age group of 45 to 60 years. 74 percent of the patients were males while the remaining 26 percent were females. Alcohol was the etiologic factor of liver cirrhosis in 58 percent of the patients, while Nonalcoholic steatohepatitis (NASH) was the etiologic factor in 24 percent of the patients. Hepatitis C was the etiologic factor in 10 percent of the patients. Li X et al investigated cirrhosis-related left ventricular remodeling and functional changes, further, to analyze the correlations with model for end-stage liver disease (MELD) score. A total of 89 cirrhotic patients were enrolled for study and subgrouped according to MELD score: ≤ 9, 10-19, and ≥ 20. Thirty healthy individuals were enrolled as controls. All study participants underwent cardiac assessment of the left ventricle with

Doppler echocardiography; the parameters assessed included left ventricular-end systolic diameter (LVESD), left ventricular end-diastolic diameter (LVEDD), interventricular septal thickness (IVST), left ventricular posterior wall thickness (LVPWT), left atrial diameter (LAD), left ventricular ejection fraction (LVEF), cardiac output (CO), mitral flow velocity (VE/VA ratio), and E-wave deceleration time (DT). The cirrhotic patients had significantly higher LVESD, LVEDD, IVST, LAD, CO and DT than the control group, but significantly lower VE/VA ratio (all $P < 0.05$). Subgroup analysis showed that the higher the MELD score, the greater the increase in LVESD, LVEDD, IVST, LAD and DT (all $P < 0.05$). Nearly one-half of the cirrhotic patients showed left atrial enlargement and a VE/VA ratio ≤ 1, and these features were more common in patients with MELD score ≥ 20. LAD, LVEDD and DT were positively correlated with MELD score. Patients with cirrhosis had impaired cardiac function, mainly present as left ventricular diastolic dysfunction, and the extent of dysfunction was correlated with the MELD score. Left atrial enlargement and VE/VA ratio ≤ 1 may serve as useful diagnostic indexes for cirrhotic cardiomyopathy.[10] In the present study, left atrial enlargement was found to be present in 46 percent of the patients while it was absent in 54 percent of the patients. Among 29 patients in whom alcohol was the etiologic factor for liver cirrhosis, left atrial enlargement was found to be present in 14 patients. Among the 12 patients in whom NASH was the etiologic factor, left atrial enlargement was found to be present in 5 patients. Non-significant results were obtained while correlating the presence of left atrial enlargement with etiologic profile. Cirrhotic cardiomyopathy is the term used to describe chronic cardiac dysfunction in patients with cirrhosis, characterized by blunted contractile responsiveness to stress, and/or altered diastolic relaxation with electrophysiological abnormalities, in the absence of known cardiac disease. Various rhythm disturbances have been described in cirrhotic patients over the years including atrial fibrillation, atrial flutter, atrial and ventricular ectopy and ventricular arrythmias. Yet, whether these conductance abnormalities are due to cirrhosis in general or secondary to the arrhythmogenic properties of alcohol remains an issue of contention.[8- 10]

CONCLUSION

From the above results, the authors conclude that derangement of cardiac functions does occur significantly in liver cirrhosis patients.

REFERENCES

1. Wade M. R., Chandraratna P. A., Reid C. L., Lin S. L., Rahimtoola S. H. Accuracy of nondirected and directed M-mode echocardiography as an estimate of left atrial size. Am J Cardiol. 1987;60(14):1208–11.

2. Wiese S, Mortensen C, Gøtze JP, Christensen E, Andersen O, Bendtsen F, Møller S. Cardiac and proinflammatory markers predict prognosis in cirrhosis. Liver Int. 2014;34:e19–30.

3. Sun FR, Wang Y, Wang BY, Tong J, Zhang D, Chang B. Relationship between model for end-stage liver disease score and left ventricular function in patients with end-stage liver disease. Hepatobiliary Pancreat Dis Int. 2011;10:50–4.

4. Silvestre OM, Bacal F, de Souza Ramos D, Andrade JL, Furtado M, Pugliese V, Belleti E, Andraus W, Carrilho FJ, Carneiro D'Albuquerque LA, Queiroz Farias A. Impact of the severity of end-stage liver disease in cardiac structure and function. Ann Hepatol. 2013;12:85–91

5. Kircher B., Abbot J. A., Pau S., et al. Left atrial volume determination by biplane two-dimensional echocardiography: validation by cine computed tomography. Am Heart J. 1991;121(3 Part 1):864–71.

6. Valeriano V, Funaro S, Lionetti R, Riggio O, Pulcinelli G, Fiore P. Modification of cardiac function in cirrhotic patients with and without ascites. Am J Gastroenterol. 2000;95:3200–5.

7. Pozzi M, Carugo S, Boari G, et al. Evidence of functional and structural cardiac abnormalities in cirrhosis patients with or without ascites. Hepatology. 1997;26:1131–7.

8. Vandenberg B. F., Weiss R. M., Kinzey J., et al. Comparison of left atrial volume by two-dimentional echocardiography and cine-computed tomography. Am J Cardiol. 1995;75(10):754–7.

9. Himelman R. B., Cassidy M. M., Landzberg J. S., Schiller N. B. Reproducibility of quantitative two-dimensional echocardiography. Am Heart J. 1988;115(2):425–31.

10. Li X, Yu S, Li L, Han D, Dai S, Gao Y. Cirrhosis-related changes in left ventricular function and correlation with the model for end-stage liver disease score. Int J Clin Exp Med. 2014;7(12):5751–7.

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