



DIASTOLIC DYSFUNCTION AS A MARKER IN PREDICTING THE POOR PROGNOSIS IN PATIENTS WITH LIVER CIRRHOSIS.

General Medicine

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ABSTRACT

Background – Liver cirrhosis is a chronic hepatic disease which is associated with cardiovascular abnormalities. Hyperdynamic circulation in liver cirrhosis causes functional and structural cardiac alterations. The prevalence of left ventricle diastolic dysfunction (LVDD) in cirrhotic patients ranges from 25.7% to as high as 81.4% as reported in various different studies. During the course of cirrhosis, there is an impairment in cardiac function with decrease in cardiac output. This process is due to a cirrhotic cardiomyopathy with diastolic dysfunction that may compromise the inotropic function which takes place in parallel with a chronotropic heart dysfunction.

Methodology - This is a case series study conducted among patient admitted in SNMC & HSK hospital with clinical features and laboratory tests suggestive of cirrhosis of liver from January 2020 to October 2020. 70 cases above 18 years of age were selected. The 2D-ECHO was done in lying down and resting position. Sample size estimation was done using open epi Software version 2.3.1

Results - Among the 70 cases, 14 patients (20.89%) diagnosed with grade III diastolic dysfunction and of 45 patients (67.16%) had grade II diastolic dysfunction on echocardiogram.

Conclusion - The present study helps in assessing early diagnosis and treatment of cardiac abnormalities in cirrhosis of liver there by reducing morbidity and mortality associated cardiac abnormalities in patients with underlying cirrhosis of liver.

KEYWORDS

2D-ECHO, Cardio Vascular diseases, liver cirrhosis

INTRODUCTION

Cirrhosis is a major health problem and is one of the most common causes of death worldwide. It is associated with a wide range of cardiovascular abnormalities. Patients with cirrhosis typically demonstrate disturbance of circulatory system. Hyperdynamic circulation presented in patients with liver cirrhosis causes functional and structural cardiac alterations. The most common cardiac abnormality that occurs among cirrhotic patients is left ventricular diastolic dysfunction (LVDD) related to development of myocardial fibrosis, hypertrophy and subendothelial edema . Diastolic dysfunction occurs when the passive elastic traits of the myocardium are reduced due to the increased myocardial mass and changes in the extracellular collagen. These changes induce myocardial remodelling and left ventricle hypertrophy resulting in systolic and diastolic dysfunctions and cardiomyopathy. Chronic heavy alcohol consumption can result in systolic and diastolic dysfunction, left ventricular dilatation, conduction abnormalities, and decreased ejection fraction resulting in alcoholic cardiomyopathy. Sudden death is an important cause of mortality associated with alcoholism.

METHODOLOGY:

Study design: case series study.

Patient admitted in HSK hospital with clinical features and laboratory tests suggestive of cirrhosis of liver from January 2020 to October 2020. 2D-ECHO was done at the time of admission of patients fulfilling the inclusion and exclusion criteria of our study.

INCLUSION CRITERIA: Patients age 18yrs above with clinical features and Laboratory tests suggestive of cirrhosis of liver

EXCLUSION CRITERIA: Patient with IHD, T2DM, malignancy, Patients with primary cardiac or pulmonary disease, Diagnosed hypertensive patients, Post-partum and pregnancy or any systemic illness.

STATISTICAL ANALYSIS

Sample size estimation was done using open epi software version 2.3.1 At 95% confidence level and 12% absolute precision. According to the study conducted by Gupta R et al Sample size is 70. Formula used $n = \frac{DEFF * N * p(1-p)}{[(d^2 / Z_{1-\alpha/2}^2 * (N-1) + p * (1-p)]}$

2D-ECHO:-

2D Echo were done by Philips HD with adult probe, and was used to assess cardiac anomaly with special reference to left ventricle end diastolic volume. Left ventricle diastolic dysfunction was defined and

its grading (1, 2, 3) classified according to ASE 2009 or 2016 guidelines^[7].

Older studies used only E/A ratio from the echocardiographic parameters to define LVDD but this ratio is very reliable on preload, and is age-related^[6,2]. With increasing age E/A ratio normally decreases^[6] Hence E/A ratio is not used in our study.

RESULTS

Study results of 70 patients with liver cirrhosis are as follows

Age distribution of the study participants in the age group of 20-40 years (44.8%) , followed by 41-60 years (39%) and 61-80 years (16%). Out of 70 cases, 63 were male and 7 were female.

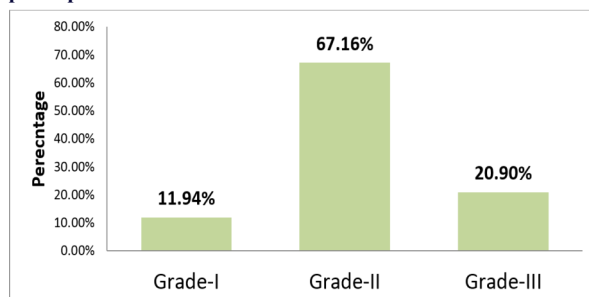
Primary diagnosis among study participants was cirrhosis of liver with portal HTN with ascites among 38 of the participants, followed by cirrhosis of liver with portal HTN and without ascites among 17 of the participants and cirrhosis of liver with portal HTN with hepatic encephalopathy was diagnosed among 12 of the participants.

Table no 1: Grading of Diastolic dysfunction among study participants

Grading	Frequency	Percentage
Grade I- Diastolic dysfunction	8	11.94%
Grade II- Diastolic dysfunction (Pseudonormal)	45	67.16%
Grade –III diastolic dysfunction	14	20.90%

Majority of the individual in all the groups were falling in the grade II- Diastolic dysfunction

Graph no 1:- Grading of Diastolic dysfunction among study participants



DISCUSSION

Alcohol has been considered a cardiotoxin, regular heavy alcohol consumption is associated with a type of nonischemic dilated cardiomyopathy called as alcoholic cardiomyopathy. In general, alcoholic patients consuming regularly for 5 years are at risk for the development of asymptomatic alcoholic cardiomyopathy, which is clinically expressed as an impairment of left ventricular function, those who continue to drink for longer period may become symptomatic and develop signs and symptoms of heart failure^[1]. Hence early detection will be useful in preventing the adverse cardiovascular events like sudden cardiac arrest, Atrial Fibrillation, Ventricular Tachycardia.

In the study of Lee et al, the survival rate was substantially lower in patients with LVDD than in those without LVDD (31.1 mo vs 42.6 mo, $P=0.01$)^[2].

In Ruiz-Del-Albor study patients without LVDD had the longest and those with grade 2 LVDD the shortest probability of survival [95% vs 39% ($P<0.01$), respectively]^[3].

Tevetia HV et al, Assessed the Cardiac Functions in patients with Cirrhosis of Liver and Studied the Prevalence of Cirrhotic Cardiomyopathy in these patients. A cross sectional observational study was undertaken where 32 patients with cirrhosis of liver were enrolled after excluding any known cardiac illness and known causes of cardiomyopathy. Patients were subjected to biochemical and sonographic evaluation to confirm Cirrhosis of liver. Cardiac assessment was performed non-invasively using electrocardiogram, transthoracic echocardiography. Results showed that among the 32 patients very high prevalence of diastolic dysfunction was found among the study group^[4].

P Karki et al, did an echocardiographic evaluation of cardiac functions in patients with liver cirrhosis. Findings showed that Out of these 85 patients, the diastolic function was impaired in a total of 42 patients. 31 had grade 1 diastolic dysfunction while 11 had grade 2 diastolic dysfunction. Analysis of relation between various parameters like duration from diagnosis, history of alcohol consumption, amount of alcohol consumption, laboratory parameters like AST, ALT, INR, platelet count and endoscopic findings of esophageal varices with the presence of diastolic dysfunction. The result showed that the relation of these parameters with diastolic dysfunction was not statistically significant which showed that presence of diastolic dysfunction is due to cirrhosis alone and it does not depend on the parameters mentioned above^[5].

CONCLUSION

Patients with cirrhosis who have cardiac dysfunction, may or may not manifest clinically with symptom or signs hence all patients should be screened for structural and functional cardiac abnormalities irrespective of age, sex or cause of cirrhosis. Early detection of cardiovascular abnormalities will help in reducing the mortality and morbidity. 2DEcho being a noninvasive procedure with high safety, will help in early detection of cardiovascular abnormalities in cirrhosis of liver. This systemic analysis suggests that left ventricle diastolic dysfunction is an attribute of liver cirrhosis which has not received sufficient attention from clinicians so far.

Future clinical trials should evaluate how using of β -blockers in cirrhotics and other prognostic factors affects cardiac function, especially LVDD and its grade. In order to clarify the correlation between the severity of liver cirrhosis and LVDD and to elucidate the pathogenetic association between liver damages and cardiac impairment, the more large-scale prospective research is needed.

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