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Original Article

Incidence of Cirrhotic Cardiomyopathy in patients of Cirrhosis

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ABSTRACT:
Introduction: Cirrhotic cardiomyopathy (CCM) is one of the complications of cirrhosis and is known to be the major cause of mortality and morbidity in liver cirrhotic patients. Early detection of CCM in cirrhosis is necessary for better outcome. **Aim**: To assess the incidence of cirrhotic cardiomyopathy in patients of cirrhosis and assess the complications apart from cardiomyopathy. **Materials and methods:** The study was conducted on 200 cirrhotic subjects (cases) who attended department in Guru Nanak Dev Hospital, Amritsar. Patients diagnosed with liver cirrhosis depending on clinical evidence of stigmata of chronic liver disease and ultrasonographic coarse echo texture and shrunken liver irrespective of age, sex and aetiology were included in the study. **Results**: Amongst 200 patients of cirrhosis 64 were having cirrhotic cardiomyopathy that is 32%. Apart from cardiomyopathy148 patients were having ascites and 114 patients were having hepatic encephalopathy. **Conclusion**: Hepatologists should be aware of this silent entity and actively search for it because it is of major importance in the management of the cirrhotic patient as it contributes to the high cardiovascular morbidity and mortality.
Key words: Ascites, cardiomyopathy, cirrhosis, hepatic encephalopathy.

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INTRODUCTION:

Term Cirrhosis was coined by **Laennec** in **1826 which** means in Greek orange or twany [1]. World Health Organization (WHO) defined Cirrhosis as a diffuse process characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules[2,3]."Cirrhotic Cardiomyopathy" is defined at present as: 1) baseline increased cardiac output but blunted ventricular response to stimuli, 2) systolic and/or diastolic dysfunction, 3) absence of overt left ventricular failure at rest, 4) electrophysiological abnormalities including prolonged QT interval on electrocardiography and chronotropic incompetence[4-6].There is scanty information regarding the actual occurence of cirrhotic cardiomyopathy due to the fact that the disease usually remains silent with near normal cardiac function unless the patients are exposed to stress. It has been estimated that as many as 50 % of patients undergoing liver transplantation developed some signs of cardiac dysfunction[7] and about7–21 % of patients died from heart failure in the post liver transplantation period[8].Cirrhosis is very serious condition and associated with a range of cardiac abnormalities. Cirrhotic cardiomyopathy (CCM) is one of the complications of cirrhosis apart from ascites, portal hypertension, encephalopathy etc. and is known to be the major cause of mortality and morbidity in liver cirrhotic patients. Hence early detection of CCM in cirrhosis is necessary for better outcome. The aim of the study is to assess the incidence of cirrhotic cardiomyopathy in patients of cirrhosis.

METHOD OF DATA COLLECTION:

200 cirrhotic subjects (cases) were included in study. Written informed consent was taken. A standard questionnaire including a detail history of present and past medical conditions; family history of medical diseases; previous history of medications, alcohol, drug addiction and blood or blood product transfusion was taken. Physical examination including general physical examinations, per abdominal examination, cardiovascular examination, respiratory examinations and central nervous system examination was done. Fasting blood sugar was checked for all study participants. CBC, LFTs, Urea, Creatinine, INR were done. Testing for HIV, HBV and HCV (HIV ELISA, HbsAg, AntiHCV Ab) were done. Corrected QT(QTc) was calculated by using Bazett formula ($QT/\sqrt{RR}$). All the cases were investigated for ultrasonographic evidence of cirrhosis. Echocardiography was done to assess cirrhotic cardiomyopathy. All the subjects were evaluated by 2D Transthoracic Echocardiography. The M-mode, 2-D and Doppler echocardiographic evaluations were performed in the left lateral position with a high frequency transducer

interfaced with a Titanium Sonosite Machine. Ejection fraction was measured with doppler echocardiography using apical 4 chamber/2 chamber view using simpson method. Diastolic dysfunction was assessed from the measurement of mitral doppler E and mitral Doppler A in flow velocities and E/A ratio was calculated. The data was collected systematically and analysed statistically according to the standard statistical methods.

INCLUSION CRITERIA:
Patients diagnosed with liver cirrhosis depending on clinical evidence of stigmata of chronic liver disease and ultrasonographic coarse echo texture and shrunken liver irrespective of age, sex and aetiology.

EXCLUSION CRITERIA: Patients with:
1.Cardiovascular diseases.
2.Type 1 and type 2 diabetes mellitus.
3.Renal failure of any cause other than cirrhosis.
4.Severe anaemia.

The data was collected systematically and analysed statistically. Continuous variables such as age and QTc interval (sec) and E/A ratio was expressed as mean with standard deviation. Categorical variables such as sex, Child-Pugh Class, E/A ratio, prolong QT interval, Ejection fraction (EF), presence or absence of cirrhotic cardiomyopathy were expressed as frequency and percentage. Chi-square test was applied for comparing categorical variables such as Child- Pugh Class, E/A ratio less than 1 or equal to or more than 1, QT interval less than 0.44 Sec or equal to or more than 0.44sec and Ejection fraction (EF) less than 55% or equal to or more than 55% with cirrhotic cardiomyopathy. A p-value < 0.05 was considered as statistically significant.

RESULTS: The study was conducted on 200 cirrhotic subjects (cases) who attended outdoor and indoor patient department in Guru Nanak Dev Hospital, Amritsar.

TABLE 1: AGE

PARAMETER		WITH CCM (MEAN±SD)	WITHOUT CCM (MEAN±SD)	TOTAL (MEAN±SD)	P VALUE	
AGE		52.62±12.17	51.63±12.21	51.95±12.21	0.59	T TEST

CCM = CIRRHOTIC CARDIOMYOPATHY

The mean age for the patients with CCM is 52.62 years and for patients without CCM is 51.63 years. The overall mean age of patients is 51.95 years.

FIGURE 1: SHOWING MEAN AGE IN BOTH GROUPS

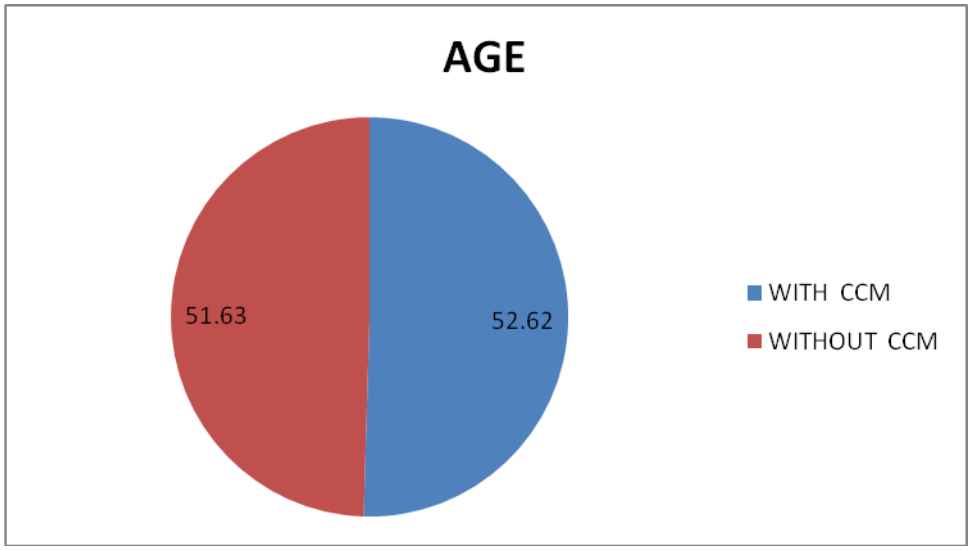


TABLE 2: SEX DISTRIBUTION

PARAMETER		WITH CCM	WITHOUT CCM	TOTAL	P VALUE	
SEX	MALES	43	104	147	0.37	CHI SQUARE
	FEMALES	19	34	53		

FIGURE 2: SHOWING SEX DISTRIBUTION IN BOTH GROUPS

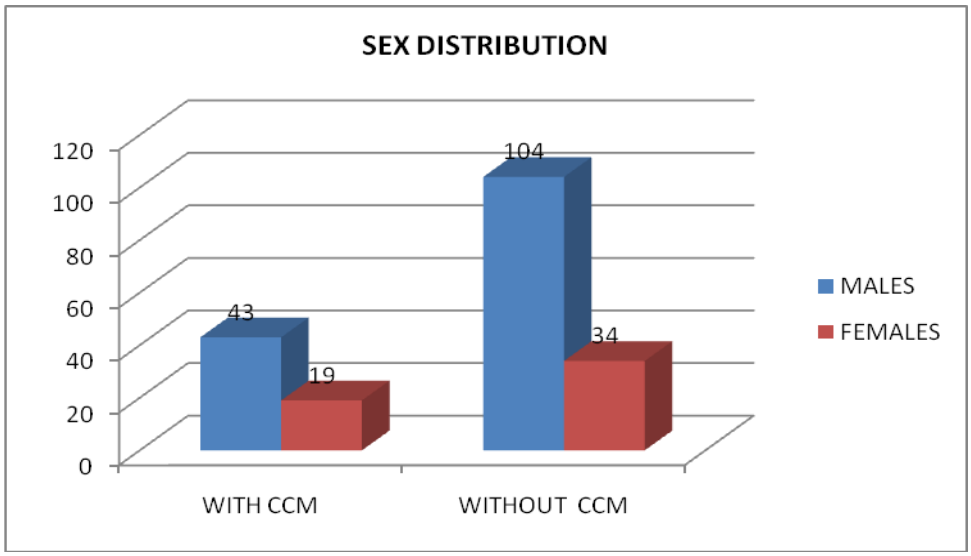


TABLE 3: ETIOLOGY

PARAMETER		WITH CCM (MEAN±SD)	WITHOUT CCM (MEAN±SD)	TOTAL	P VALUE	
AETIOLOGY	ALCOHOL	41	106	147	O.215	CHI SQUARE
	HCV	15	19	34		
	HBV	5	6	11		
	UNKNOWN	3	5	8		

MOST COMMON ETIOLOGICAL FACTOR IN BOTH THE GROUPS IS ALCOHOL FOLLOWED BY HCV AND HBV

FIGURE 3: SHOWING ETIOLOGIES OF DISEASE IN BOTH GROUPS

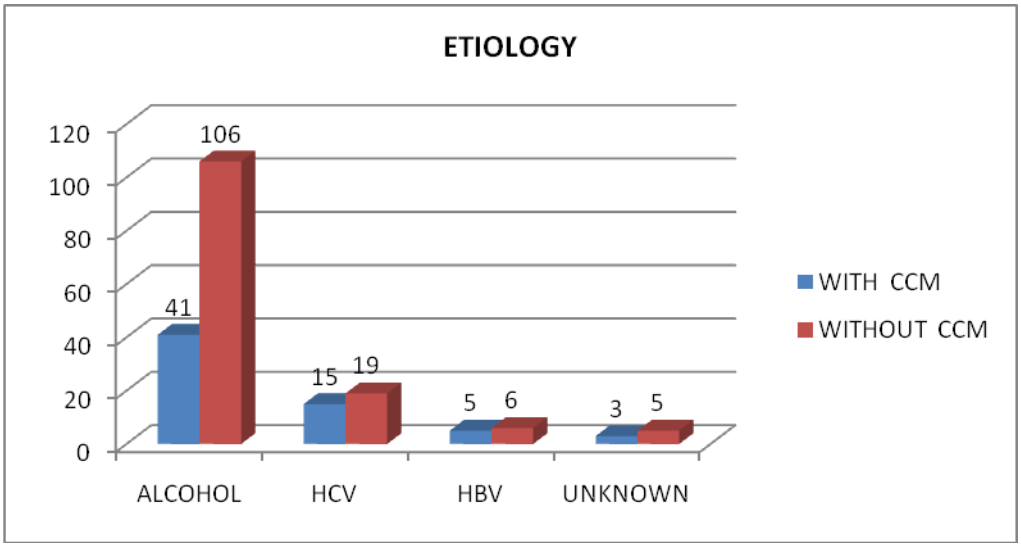


TABLE 4: DISTRIBUTION OF CASES ACCORDING TO CHILD PUGH CRITERIA

PARAMETER		WITH CCM	WITHOUT CCM	TOTAL	P VALUE	
SEVERITY OF CIRRHOSIS (CHILD PUGH)	SCORE A	2	10	12	0.44	CHI SQUARE
	SCORE B	24	44	68		
	SCORE C	38	82	120		

12 patients were having CHILD PUGH SCORE A, 68 patients were having CHILD PUGH SCORE B and 120 patients were having CHILD PUGH SCORE C

FIGURE: 4 SHOWING CASE DISTRIBUTION ACCORDING TO CHILD PUGH SCORE

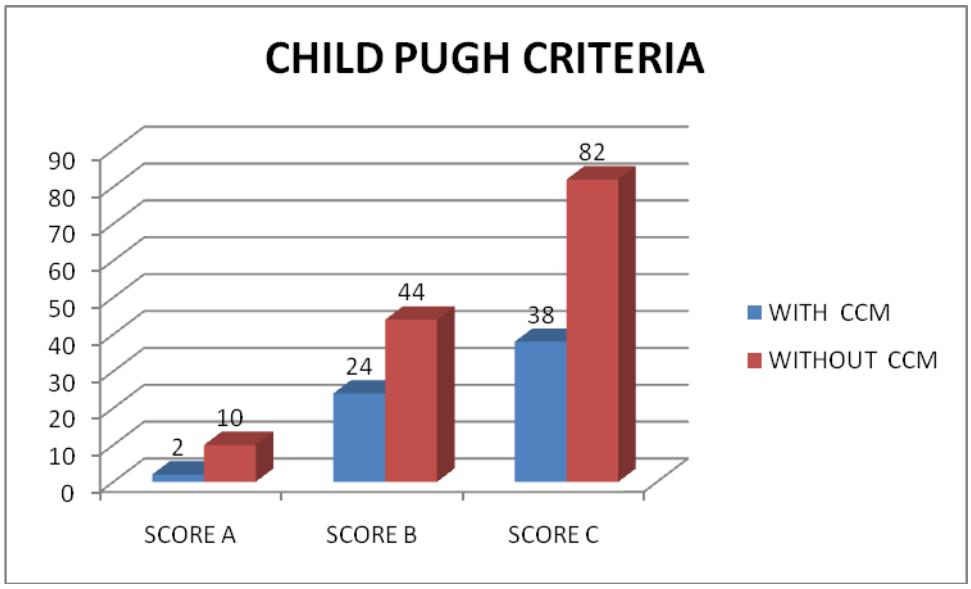


TABLE 5: INCIDENCE OF CIRRHOTIC CARDIOMYOPATHY IN PATIENTS OF CIRRHOSIS

	WITH CCM (%)	WITHOUT CCM (%)	TOTAL
NO. OF PATIENTS	64 (32%)	136 (68%)	200

Amongst 200 patients of cirrhosis 64 were having cirrhotic cardiomyopathy that is 32%.

FIGURE 5: SHOWING INCIDENCE OF CARDIOMYOPATHY IN BOTH GROUPS

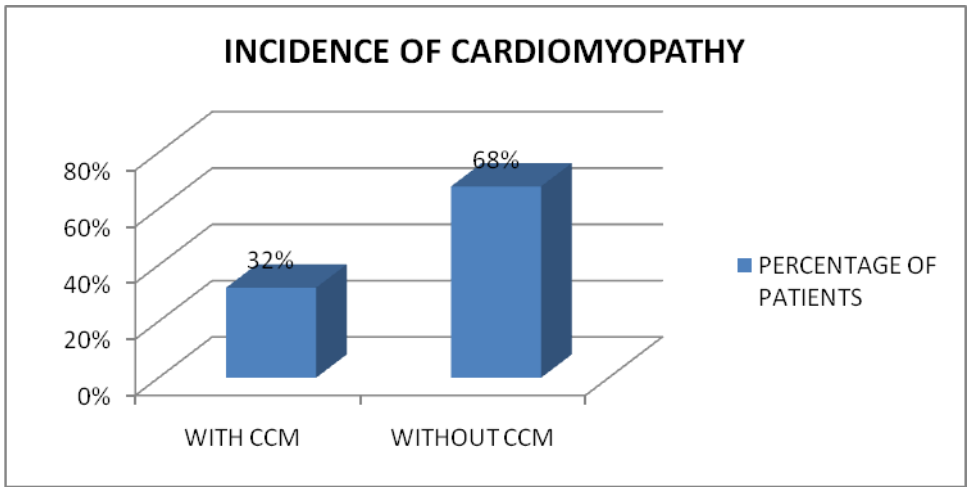
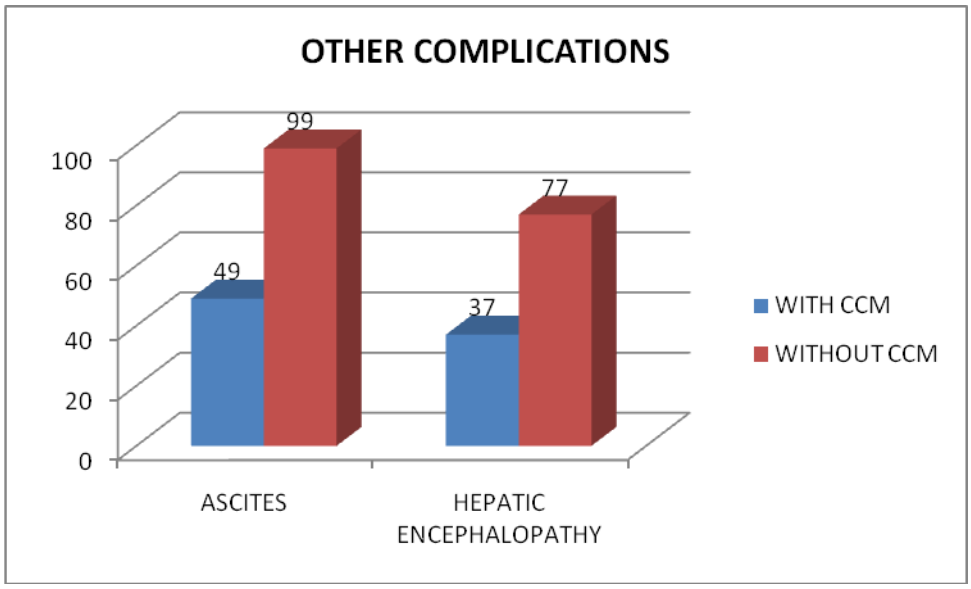


TABLE 6: COMPLICATIONS APART FROM CARDIOMYOPATHY

COMPLICATION	WITH CCM (N= 64)	WITHOUT CCM (N=136)	P VALUE (CHI SQUARE)
	PRESENT	PRESENT	
ASCITES	49	99	0.91
HEPATIC ENCEPHALOPATHY	37	77	

148 patients were having ascites and 114 patients were having hepatic encephalopathy but this between the two groups difference was not statistically significant.

FIGURE 6: SHOWING PATIENTS WITH OTHER COMPLICATIONS IN BOTH GROUPS



DISCUSSION: In the present study the mean age for the patients with cirrhotic cardiomyopathy is 52.62 years and for patients without cirrhotic cardiomyopathy is 51.63 years. The overall mean age of patients is 51.95. Amongst 200 patients of liver cirrhosis 43 males and 19 females have cirrhotic cardiomyopathy, 104 males and 34 females present without cirrhotic cardiomyopathy. In a study done by Yasmine S et al (2004)[9]30 patients were included the mean age of presentation was 43 years with a male to female ratio of 2:1. Similar type of presentation was recorded in another study by Joshi N et al (2007)[10];including 133 patients of chronic liver diseases in the age group of 11-75 years; the mean age of patients being 45.7 +14.0 years. In our study mean age of presentation was nearly similar to other studies.

Most common etiological factor in both the groups is alcohol (147) followed by HCV (34), HBV (11) and 8 patients were of unknown etiology. Sherlock S et al (2002)[11] reported Alcohol to be frequent cause of liver disease in western countries.

Despite HBV being reported as the most common cause of cirrhosis of liver in most parts of Asia, the pattern of liver disease in our study is different. Possible explanations include social and cultural differences in attitudes to alcohol, the quantities and qualities of alcohol consumed and genetic differences in the metabolism and effects of alcohol.[12]

In our study 12 patients were having child pugh score A, 68 patients were having child pugh score B and 120 patients were having child pugh score C. The majority of the patients in this study had advanced cirrhosis of the liver which is similar to former studies done by Attia KA (2008)[13], Butt S et al (2009)[14]. An earlier study done by Tai Ml et al (2010)[15] contrasted to our study and showed less advanced chronic liver disease. This dissimilarity between the studies is probably due to an ineffective health care system, lack of education, poverty, and false beliefs about the disease.[16]

In our study, we did not find any relation between CCM and Child-Pugh classification. Controversy exists regarding the relation between the CCM and the severity of the disease. Kumar SS et al (2017)[17]found a strong relation between cardiomyopathy and severity of cirrhosis of liver which is not in accordance to our study. While others studies done by Burgess MI et al (2006)[18] Moller S et al (2013)[19],Karagiannakis DS et al (2013)[20], Merli M et al (2013)[21]and Enache I et al (2013)[22] stated that CCM is not directly related to disease severity and this was in accordance to our study.

Amongst 200 patients of cirrhosis 64 were having cirrhotic cardiomyopathy that is the incidence is 32%. Shaikh S et al (2011)[23] and Naqvi IH et al (2016)[16]in their studies showed a slightly higher frequency (44% and 39.32%) of cirrhotic cardiomyopathy in comparison to our study. The higher frequency of cirrhotic cardiomyopathy in the above-mentioned studies is possibly due to variation in sample size. In the study done by Shaikh S et al (2011)[23] cirrhotic cardiomyopathy was not confirmed on stress echocardiography.

Cirrhosis patients should have screening for cardiac function once diagnosis is made and at least prior to a scheduled major procedure that can unmask the dysfunction and lead to serious morbidity or death. Regarding the screening method, it appears that echocardiography identifies a larger proportion of patients with cardiomyopathy. A large number of patients have not had screenings for CCM. Awareness should be increased among providers to increase recognition and target therapy.

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