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Original Research Article

A STUDY OF DEMOGRAPHIC PROFILE, AETIOLOGIC PROFILE AND PREVALENCE OF LEFT VENTRICULAR DYSFUNCTION IN CIRRHOSIS OF LIVER TREATED IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background-. Liver and heart are closely related. Electrocardiographic (ECG) and Echocardiographic studies may reveal cardiac abnormalities in patients with Chronic liver disease (CLD) which can be addressed if recognized early. **Aims&Objective** 1) To study the demographic profile of patients of Chronic liver disease CLD 2) To study the aetiological profile of CLD 3) To study ECG and Echocardiographic abnormalities in patients with CLD.

Material and Methods-This prospective study was conducted in 91 indoor patients who were not terminally ill. Ischaemic Heart Disease, Valvular heart disease, Hypertensive heart disease and Diabetes were excluded. After history taking, clinical examination and investigations data was entered in pretyped proforma.Cardiac evaluation was done in all by ECG and Echocardiography and the data was analysed**.**

Results Out of 91 selected for study, males outnumbered females. Most of them 61 (67.03%) were in 46-60 years age group. 65 (71.43%) of the patients were from rural areas, while only, 26 patients (28.57%), were from urban areas. Chronic liver disease was ethanol related in 43(60.56%) males and 5(25%) females. HBsAg related in 11(15.49%) males and 5(25%) females ,HCV related in 2(2.82%) males and 3(15%) females and idiopathic in 13(18.31%) males and 7(35%) females . Prolonged QTc interval was found to be present in 15 (16.48%) cases**.**

10 (10.9%) patients had pure diastolic dysfunction,5 (5.49%)had both diastolic and systolic dysfunction. There was significant association of prolonged QTc with left ventricular dysfunction.P-value 0.00216.

Conclusion-Cirrhosis of liver is often alcohol related disease of middle aged males from rural background .ECG abnormalities and Echocardiographic abnormalities are commonly encountered.

KEYWORDS - Chronic liver disease, Electrocardiography, Echocardiography.

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INTRODUCTION

Cardiovascular diseases and liver diseases are closely related. Aetiologically, cirrhosis has multiple causes. The leading causes include alcoholic liver disease, chronic viral hepatitis B and C, NAFLD and autoimmune diseases. Less common causes include Wilson's disease and hemochromatosis, autoimmune hepatitis.

Cirrhotic Cardiomyopathy includes systolic, diastolic, and electrocardiographic abnormalities that develop in the setting of liver cirrhosis in a previously normal heart.1 Hyperdynamic syndrome in patients with cirrhosis and portal hypertension is characterized by increased heart rate and cardiac output, and reduced systemic vascular resistance and blood pressure. 1 Changes in left ventricular (LV) functions have recieved attention but the exact mechanism leading to left ventricular dysfunction in Chronic Liver Disease (CLD) is not clear.

With these insights, there is a need for comprehensive cardiac evaluations in CLD patients herein this study. Early diagnosis of CLD provides survival advantages, and multidisciplinary approach and treatment may lessen mortality and morbidity in cirrhosis of liver.

AIMS AND OBJECTIVES

1.To study the demographic profile of patients of cirrhosis of liver admitted in New JA Hospital Gwalior

2.To study the aetiological profile in patients admitted with cirrhosis of liver

3.To study ECG changes and Echocardiographic changes in patients with cirrhosis of liver

MATERIALS AND METHODS

This study was a prospective study conducted in the Department of General Medicine at G.R. Medical College, Gwalior New JA Hospital Madhya Pradesh, India, spanning from June 2022 to March 2024. A total of 91 patients admitted with cirrhosis of liver were included in the study.

Inclusion Criteria--Patients diagnosed with cirrhosis of liver who were not terminally ill were included in this study .Exclusion Criteria --Patients with coronary , valvular heart disease, hypertensive heart disease and diabetes were excluded. After detailed history taking including socioeconomic status according to modified Kuppuswamy scale clinical examination was done. Investigations included routine biochemical profile in addition to liver function test and ascites routine microscopy. Ultrasonography was done in all the cases and Electrocardiogram (ECG) was performed to study electrical abnormalities . Echocardiogram was done to assess left ventricular function. Datas were entered in a pretyped proforma. Statistical Analysis was done using SPSS software.

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OBSERVATIONS AND RESULTS

Table 1: Genderwise distribution

Male	71	78.02%
Female	20	21.98%
Total	91	100%

LEGEND Table 1---71 males and 20 females were enrolled as subjects.

Table 2: Age distribution

Age Interval	Count	Percentage
30-45	23	25.27%
46-60	61	67.03%
61-75	7	7.69%
Total9	**91**	**100.00%**

LEGEND Table 2 Most of the patients were between 30 -60 years age group.

Table 3: Distribution of patients based on the basis of location

Description	Count	Percentage
Rural	65	71.43%
Urban	26	28.57%
Total	**91**	**100%**

LEGEND TABLE-3 65 (71.43%) of the patients were from rural areas, while only, 26 patients (28.57%), were from urban settings.

Table 4: Distribution of socioeconomic status of the study population according to modified kuppuswamy scale

Socioeconomic Status	Count	Percentage
Upper Class	0	0%
Upper Middle	14	15.38%
Lower Middle	29	31.87%
Upper Lower	37	40.66%
Lower	10	10.99%
Total	**91**	**100%**

LEGEND TABLE 4- Most of the patients 37 (40.66%) were in upper lower group

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Table 5: Gender-wise Distribution of Aetiologies of Chronic Liver Disease

Etiology of CLD	**Male (%) n71**	**Female (%) n2**	**Total (%)**
Ethanol	43(60.56%)	5(25%)	48
HBsAg	11(15.49%)	5(25%)	16
HBsAg + Ethanol	2(2.82%)	--	2
HCV	2(2.82%)	3(15%)	5
Others	13(18.31%)	7(35%)	20

LEGEND TABLE -5 Ethanol was the commonest aetiology of Chronic liver disease

Table 6: Child Pugh staging of patients

CPT_Stage	Male (count and %)	Female (count and %)	Total (count and %)
A	10 (10.99%)	3 (3.3%)	13 (14.29%)
B	32 (35.16%)	11 (12.09%)	43 (47.25%)
C	29 (31.86%)	6 (6.6%)	35 (38.46%)

LEGEND TABLE- 6. Most of the patients were in Child Pugh B 43 (47.25%)

Table 7: ECG findings among patients at different Child Pugh stages

CPT Stage	Low Voltage Complex	LVH with LBBB	Multiple Extrasystoles	Qt Prolongation	Normal
A n=13	1(7.69%)	0	0	1 (7.69%)	11(84.6%)
B n=43	1(2.3%)	0	1(2.3%)	3 (6.9%)	38 (88.3%)
C n=35	2(5.7%)	1(2.8%)	0	11 (31.4%)	21 (60%)

LEGEND TABLE- 7 21 (23.07%) with Chronic liver disease had ECG abnormalities.

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Table 8: Correlation between prolonged QTc intervals and the prevalence of LV dysfunction

QTc	Left Ventricular Dysfunction	Normal Ventricular Function	P Value
Prolonged	**7 (7.69%)**	**8 (8.79%)**	**P=0.00216**
Normal	**8 (8.79 %)**	**68 (74.7%)**	

LEGEND TABLE-8 Table shows significant association of prolonged QTc with left ventricular dysfunction

Total 91 cases were selected as subjects with71 (78.02%) males and 20 (21.98%) females Table-1. 23(25.27%) cases were in the age group 30 to 45 years ,61 (67.03%) cases 46-60 years age group and 7 (7.69%) cases in 61-75 years age group. Table-2

65 (71.43%) of the patients were from rural areas, while only, 26 patients (28.57%), were from urban areas. Table-3

14(15.38%) cases from upper middle class 29 (31.87%) cases from lower middle class 38(41.7%) cases from upper lower and 10 (10.99%)cases from lower socioeconomic class. Table-4

Chronic liver disease was ethanol related in 43(60.56%) males and 5(25%) females, HBsAg related in 11(15.49%) males and 5(25%) females; HBsAg and ethanol related in 2(2.82%) males, HCV related in 2(2.82%) males and 3(15%)females and idiopathic in13(18.31%) males and7(35%)femalesTable-5

10 (10.99%) males and 3 (3.3%) females were in Child Pugh A ,32 (35.16%) males and11 (12.09%) females in Child Pugh stage B, 29 (31.86%) males and 6 (6.6%) females in Child Pugh stage C. Table-6

21 (23.07%) with Chronic liver disease had ECG abnormalities.

Normal ECG was seen in 11(84.6%) patients, QTc prolongation in 1(7.69%) and low voltage complex in 1(7.69%) patient with Child pugh A

Low voltage complex in 1(2.3%) patient, QTc prolongation in 3 (6.9%),

multiple extrasystoles in 1(2.3%) and normal ECG in 38 (88.3%) patients in Child pugh B

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Low voltage was found to be present in 2 (5.7%), LBBB in 1 (2.8%) and QTc prolongation in11(31.4%), normal ECG in 21 (60%)patients in Child pugh C Table-7

Systolic dysfunction and diastolic dysfunction was found to be present in 5 (5.49%) males and diastolic dysfunction in 10 (10.9%) all males. Normal ventricular function was observed in 56 males (61.5%) and 20 (21.98%) females . Prevalence of diastolic dysfunction in cirrhosis of liver was 10 (10.9%) in our study.

Prevalence of QTc prolongation was 15 (16.4%). QTc prolongation was found to be present in 7 (7.69%) patients with LV dysfunction and 8 (8.79%) in patients with normal ventricular function.QTc was normal in 8 (8.79%) with left ventricular dysfunction and 68 (74.7%) with normal ventricular function. P-value 0.00216 (Table 8)

DISCUSSION

Cirrhosis of the liver is a significant health concern in India, with a notable prevalence among males. The study focuses on the demographic, socioeconomic, and cardiac aspects of cirrhosis of the liver. Out of 91 cases 71(78.02%) were males and 20 (21.98%) females. Table-1 This distribution suggests a predominance of males. Studies indicate that males constitute a substantial majority of cases with cirrhosis of liver . 2,3 A study conducted by Jessica B. Rubin et al revealed that women have lower rates of hepatic decompensating events resulting in lower rate of hospitalisation and in-hospital mortality. This may be one of the reason for less admission in females.4 The predominant age group was 45-60 years (67.03%). Table 2. Maskey R et al in their study found that most of the cases were males and the mean age was 49.06 +/- 11.27 years (range 23-73 years).3 In a study by Idilman the median age was 54 years.5 Understanding the age distribution is crucial for clinicians as it highlights the need for targeted screening and intervention strategies primarily in middle-aged and older individuals. The rural population showed a significantly higher incidence of liver disease compared to urban population. 65 (71.43%) of the patients were from rural areas, while 26 (28.57%) patients were from urban settings. There are few studies regarding cirrhosis of liver related to rural population one of which shows similar prevalence of cirrhosis of liver in urban and rural population .6 Our findings highlight the higher prevalence of CLD in rural population Table 3. Further studies in this area will reveal such association if any. Socioeconomic analysis showed a higher prevalence of cirrhosis in the 'Upper Lower' and 'Lower Middle' classes, suggesting a link between Chronic liver disease and lower socioeconomic status Table 4. Our finding showed 37 (40.66%) patients in the 'Upper Lower' class,29 (31.87%) patients in the 'Lower Middle' class, and 14 (15.38%) patients in the 'Upper middle' class. This distribution aligns with the studies by Solanki et al.7 Alcohol-related cirrhosis was the most common cause 48 (52.7%), followed by viral hepatitis 23 (25.2%) and cryptogenic causes 20 (21.9%) Table 5. According to a study by Mishra et al alcohol was the most common cause of cirrhosis of liver and the burden of alcohol-related cirrhosis was significantly increasing in comparison to other causes including viral infection, Non alcoholic steatohepatitis (NASH), and autoimmune hepatitis.2 However, NAFLD-related cirrhosis is now being recognized as a growing burden.5

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21 (23.07%) with Chronic liver disease had ECG abnormalities Table 7. This study also suggests that prolonged QTc intervals are strongly associated with LV dysfunction in cirrhosis of liver ($p < 0.00216$). Table 8.

This finding highlights the potential clinical relevance of QTc interval assessment in evaluating LV function in these patients. Study by Bernardi et al showed that QTc interval prolongation (>440ms) was significantly higher in cirrhotic patients than healthy subjects. QTc interval is often prolonged in patients with cirrhosis regardless of aetiology of the disease, worsens with the severity of the disease, and may have important prognostic implications.8 Although prolonged QTc was observed in both alcoholic and non-alcoholic patients, there was no significant difference in prevalence between the two groups. Features of cirrhotic cardiomyopathy are hyperdynamic circulation, altered diastolic relaxation, impaired contractility, and electrophysiological abnormalities, mainly QT interval prolongation.9 Echocardiography has been the most common modality for assessing myocardial function in these patients. Other modalities are magnetic resonance imaging.9The heart and the liver are in close relation to each other. Impairment of cardiac function may lead to hepatic dysfunction and vice versa. A study showed right ventricular systolic and diastolic dysfunction among patients with liver cirrhosis.,10 Diastolic dysfunction was relatively more common in liver cirrhosis patients as compared to systolic function in our study. A study by Yousaf A, have attested to the fact that diastolic dysfunction is more prevalent in cirrhosis of liver. 11 Both heart and liver dysfunctions coexist in the setting of heart and liver diseases probably because of complex cardiohepatic interactions. In patients who have progressed to cirrhosis routine cardiac evaluation is necessary in order to lower morbidity and mortality, This requires the involvement of a multidisciplinary approach to patients with cirrhosis in order to manage the patients at early stages.12

CONCLUSION - CLD predominantly affects middle aged men as it is a chronic progressive disease. Lack of good health care and infra-structure in rural areas may have contributed to higher prevalence of cirrhosis in rural areas. Low socioeconomic strata was most affected .21 (23.07%) with Chronic liver disease had ECG abnormalities. Prevalence of QTc prolongation was 15 (16.4%). Association of QTc prolongation with LV dysfunction was significant P-value 0.00216. Prevalence of Diastolic dysfunction in cirrhosis of liver was 10 (10.9%). Cardiac evaluation in CLD will help in early recognition of left ventricular dysfunction and timely intervention.

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