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STUDY OF CARDIAC MANIFESTATIONS IN PATIENTS WITH CHRONIC LIVER DISEASE

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ABSTRACT

Background: Chronic liver disease (CLD) is associated with multiple systemic complications, of which cardiac manifestations are often underrecognized.
Objective: To evaluate the spectrum of cardiac manifestations in patients with chronic liver disease and correlate findings with liver disease severity.
Methods: 100 patients with diagnosed CLD were evaluated clinically and with ECG, chest X-ray, and echocardiography. Severity of liver disease was assessed using the Child-Pugh classification.
Results:
•Mean age: 54.3 ± 9.7 years
•Male: 63%
•Cardiovascular symptoms: 41%
•ECG: Atrial fibrillation 21%, QTc prolongation 452.7 ± 24.1 ms, ST-T changes 23%
•Echo: LA dilation 15%, biventricular dilation 26%, valvular abnormalities 41%, global LV dysfunction 77%, dilated cardiomyopathy 21%
•Child-Pugh Class C: 43%
•Strong correlation between liver disease severity and cardiac involvement.
Conclusion: Cardiac manifestations are common in CLD and increase with disease severity. Routine cardiovascular screening in CLD patients is essential.
Keywords: Chronic liver disease, Cirrhotic cardiomyopathy, Echocardiography, Atrial fibrillation, QTc prolongation, Child-Pugh score, Cardiac dysfunction.

INTRODUCTION

Chronic liver disease (CLD) is a major global health burden, with cardiac complications such as cirrhotic cardiomyopathy, arrhythmias, and pericardial effusion contributing significantly to morbidity and mortality. This study evaluates cardiovascular alterations in CLD and their correlation with liver disease severity.

AIMS AND OBJECTIVES

Aim: To evaluate the cardiac manifestations in patients with chronic liver disease.
Objectives:

- Clinically assess cardiovascular findings in CLD patients.
- Document morphological and electrical changes using ECG, chest X-ray, and echocardiography.
- Correlate cardiac findings with the severity of liver disease (Child-Pugh class).

MATERIALS AND METHODS

- **Design:** Cross-sectional observational study
- **Setting:** Department of General Medicine, BMC&RC Ballari
- **Sample size:** 100 patients with CLD
- **Investigations:** Clinical evaluation, ECG, chest X-ray, echocardiography
- **Severity Assessment:** Child-Pugh score.

RESULTS

Table 1: Gender Distribution

Sex	Number	Percentage
Male	**63**	**63.0%**
Female	**37**	**37.0%**

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Figure 1: Gender Distribution (Pie Chart)

- Male: 63%
- Female: 37%

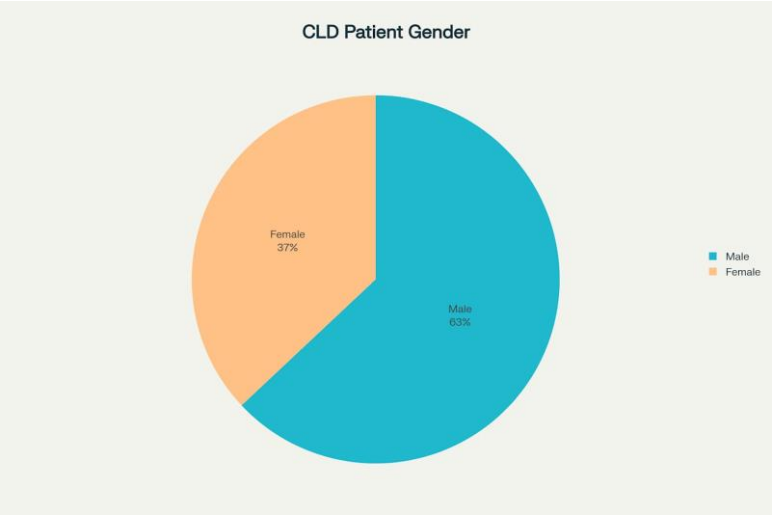

Table 2: Prevalence of Cardiovascular Symptoms

Symptoms Present	Number	Percentage
Yes	41	41.0%
No	59	59.0%

Figure 2: Cardiovascular Symptoms in CLD (Pie Chart)

- Yes: 41%
- No: 59%

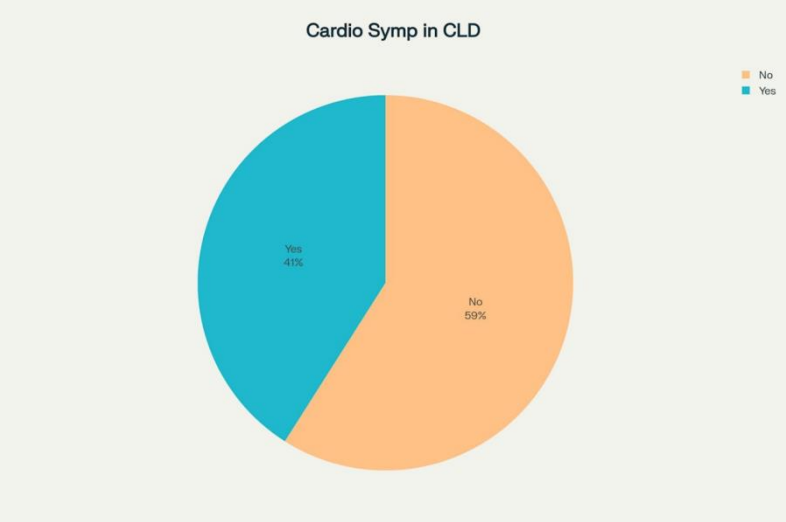

Table 3: ECG Findings

Parameter	Value
Heart Rate (bpm)	90.1 ± 13.3
Sinus Rhythm	79 (79.0%)
Atrial Fibrillation	21 (21.0%)

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QTc Interval (ms)	452.7 ± 24.1
ST-T Changes	23 (23.0%)
Arrhythmias	17 (17.0%)
Bundle Branch Block	8 (8.0%)
AV Block	5 (5.0%)

Figure 3: Prevalence of ECG Abnormalities (Bar Chart)

- Sinus Rhythm: 79%
- Atrial Fibrillation: 21%
- ST-T Changes: 23%
- Arrhythmias: 17%
- Bundle Branch Block: 8%
- AV Block: 5%

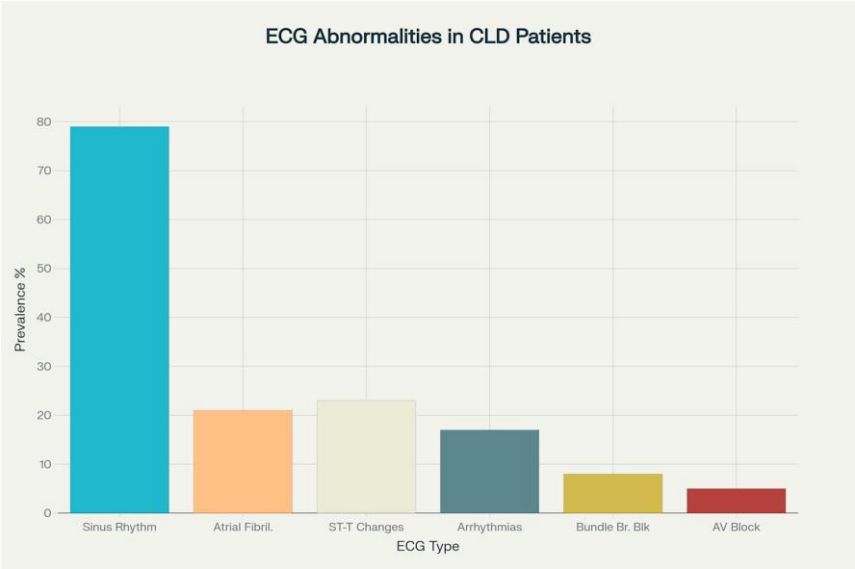

Table 4: Echocardiographic Findings

Feature	n (%)
Normal Valves	59 (59%)
Valve Abnormalities	41 (41%)
LA Dilation	15 (15%)
LA+LV Dilation	16 (16%)
RA+LA+LV Dilation	10 (10%)
MR+TR+PH	10 (10%)
Normal EF (60%)	23 (23%)
EF 55%	34 (34%)
EF 45%	23 (23%)

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Feature	n (%)
EF 40%	10 (10%)
EF 30%	10 (10%)
Dilated Cardiomyopathy	21 (21%)

Figure 4: Echocardiographic Findings (Stacked Bar Chart)

- Normal Valves vs. Valve Abnormalities
- Distribution of EF values
- Prevalence of chamber dilation

Table 5: Child-Pugh Score Distribution

Class	n	Percentage
A	23	23.0%
B	34	34.0%
C	43	43.0%

Figure 5: Child-Pugh Class Distribution (Pie Chart)

- Class A: 23%
- Class B: 34%
- Class C: 43%
-

Table 6: Laboratory Parameters in CLD Patients

Parameter	Mean ± SD
Serum Bilirubin (mg/dL)	3.2 ± 1.4
ALT (IU/L)	67 ± 23
AST (IU/L)	78 ± 26
Albumin (g/dL)	2.8 ± 0.5
INR	1.6 ± 0.3
Serum Creatinine (mg/dL)	1.3 ± 0.4
Blood Urea Nitrogen (mg/dL)	28 ± 7
Sodium (mEq/L)	132.6 ± 4.3
Potassium (mEq/L)	3.8 ± 0.6
Calcium (mg/dL)	8.1 ± 0.5

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DISCUSSION

- The findings of this study demonstrate a high burden of cardiovascular abnormalities in patients with chronic liver disease. Common manifestations included atrial fibrillation, QTc prolongation, valvular regurgitations, and dilated cardiomyopathy. These findings correlate with the known hyperdynamic circulation and electrophysiologic instability observed in cirrhotic cardiomyopathy.

- Atrial fibrillation was noted in 21% of patients—substantially higher than in the general population—likely due to electrolyte imbalances, autonomic dysfunction, and structural chamber dilation. Similarly, QTc prolongation suggests repolarization abnormalities and warrants close monitoring.

- The correlation between advancing liver disease and cardiac dysfunction was evident, with greater prevalence of EF reduction and chamber dilation in Child-Pugh class C. The integration of cardiac evaluation in CLD management is thus essential, especially in transplant candidates.

- Renal dysfunction, particularly in the form of hepatorenal syndrome (HRS), contributes significantly to cardiovascular stress in CLD.
- Reduced renal perfusion and activation of the renin-angiotensin-aldosterone system (RAAS) result in sodium and water retention, exacerbating preload and ventricular stress. Additionally, electrolyte abnormalities such as hyponatremia and hypokalemia, frequently encountered in advanced cirrhosis, can prolong repolarization and increase the risk of arrhythmias including QT prolongation and atrial fibrillation.

CONCLUSION

- Cardiac manifestations are prevalent in chronic liver disease and are strongly associated with liver disease severity. ECG and echocardiography are essential tools for early detection of subclinical cardiac dysfunction. Routine cardiac evaluation should be incorporated into the management of CLD patients to improve outcomes, especially in those with decompensated disease or pre-transplantation

REFERENCES

1. **Møller S, Henriksen JH. Cirrhotic cardiomyopathy. J Hepatol.**
2. **Lee SS.** Cardiac abnormalities in liver cirrhosis. **Korean J Hepatol**.
3. **Bernardi M**, et al. QT interval prolongation in cirrhosis. **J Hepatol.**
4. **Naschitz JE**, et al. The “hepato-cardiac” syndrome revisited. Liver Int.
5. **Kim WR**, et al. Burden of liver disease. Hepatology.

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