



ASSESSMENT OF LIVER FUNCTION TESTS IN CONGESTIVE CARDIAC FAILURE PATIENTS AT TERTIARY CARE HOSPITAL

General Medicine

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ABSTRACT

Background: Liver dysfunction in congestive cardiac failure (CCF) arises from hepatic congestion, hypoperfusion, and hypoxia, often causing centrilobular (zone 3) necrosis. **Methods:** This prospective observational study (June 2023–June 2024) at Navodaya Medical College included 75 CCF patients—due to coronary artery disease (CAD), rheumatic heart disease (RHD), hypertensive heart disease, cor pulmonale, or cardiomyopathy—and 20 healthy controls. Liver function tests (LFTs) assessed were serum bilirubin, AST, ALT, alkaline phosphatase (ALP), serum proteins, and prothrombin time (PT). **Results:** CAD (40%) and RHD (24%) predominated. Abnormal LFTs occurred in 71% overall, highest in CAD (73%) and RHD (72%). Common findings were hepatomegaly (68%), hyperbilirubinemia (71%), raised AST (52%), ALT (41%), ALP (13%), and prolonged PT (56%). Bilirubin >3 mg/dL indicated severe CCF; >5 mg/dL with hypoalbuminemia and A/G reversal predicted poor prognosis. LFTs normalized with remission, except serum proteins and PT. **Conclusion:** LFT abnormalities are frequent in CCF and correlate with etiology, severity, and prognosis.

KEYWORDS

INTRODUCTION

The liver has been the custodian of milieu interior. So many liver disorders will be having far reaching consequences on bodies homeostasis. Both acute and chronic heart failure may result in abnormalities of liver. Liver receives 25% of cardiac output, that a fall in cardiac output will result in hepatic hypoperfusion. Liver has the capacity to withstand changes in bloodflow by vasoactive mechanisms and oxygen extraction from blood. Both Right and left sided heart failure can result in liver injury. In right side failure, elevation of right heart pressure resulting in raised pressure in hepatic sinusoids, hepatic congestion and liver cell hypoxia.

In left sided heart failure, decreased cardiac output results in hepatic hypoperfusion and hypoxia. The common pathway is centrilobular hepatocellular necrosis. Zone 3 of liver lobule is most vulnerable to hypoxic injury due organization of hepatic blood flow. Understanding anatomy and functions of liver, liver enzymes, causes and various forms of congestive cardiac failure and their manifestations, pathology of liver in heart failure are needed before evaluating abnormalities of LFTs in CCF.

Aims And Objectives

To study the LFTs in CCF. To observe any differences in LFTs with the etiology of CCF. To study the relationship between LFT and remission and exacerbation of CCF. To study whether LFTs can be used as prognostic indicator in cases of CCF.

MATERIALS AND METHODS

Source Of The Study – Primary data – cases of CCF (75), of varied etiologies including CHD, RHD, HHD, COR PULMONALE and cardiomyopathy observed in admitted patients in Navodaya Medical College from June 2023–June 2024. 20 healthy individuals were taken as controls visiting Navodaya Medical College.

Design Of The Study– Prospective Observational study.

Period Of The Study– 1 YEAR (June 2023–June 2024)

Sample Size – 75 Cases, 20 Controls

Inclusion Criteria

- Cases of CCF as per Framingham criteria; of various age groups and etiologies such as Rheumatic valvular heart disease.
- Ischemic heart disease
- Hypertensive heart disease
- Congenital heart disease Cardiomyopathies

COR Pulmonale

CCF of varied presentation either acute or chronic. In this study following LFTs were done – Serum bilirubin, transaminases, alkaline phosphatases, serum proteins, prothrombin time.

Exclusion Criteria

- Known alcoholic
- Past history of jaundice
- Recent intake of hepatotoxic drugs or drugs causing raised liver parameters, such as INH, Rifampicin, steroids, chlorpromazine, amiodarone, statins, hydralazine, phenytoin and valproate
- Positive viral markers.

Controls– Healthy individuals between 20–60 years of age without any h/o of medical illness such as heart and liver disease were selected

RESULTS

Etiology Of Heart Failure

Table 1: Etiology Of Heart Failure

Etiology	No of Cases	Percentage
Rheumatic heart disease	18	24%
Coronary heart disease	30	40%
Cor pulmonale	13	17.3%
Cardiomyopathy	07	9.3%
Hypertensive heart disease	07	9.3%

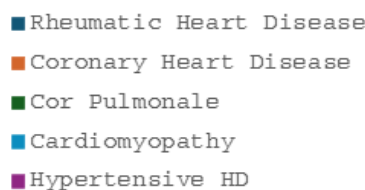
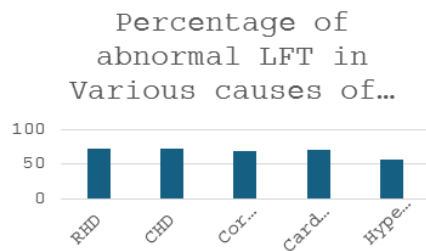


Table 2: Abnormal LFT as per etiology

Etiology	No of cases	No of cases with abnormal LFT	Percentage
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Rheumatic heart disease	18	13	72 %
Coronary heart disease	30	22	73 %
Cor pulmonale	13	09	69 %
Cardiomyopathy	07	05	71 %
Hypertensive heart disease	07	04	57 %



DISCUSSION

Hepatomegaly- seen in 51/75 Cases, 1-10 cm liver enlargement seen. Icterus – seen in 16/75 Cases (21%). Alcohol, drugs, viral hepatitis ruled out. RHDs has most number of cases with clinically detectable jaundice. Hyperbilirubinemia- 53/75 Cases (71%) Aminotransferases- Elevation seen in 3-50% of cases with RHF. Acute HF> Chronic HF elevations seen. AST elevation > ALT elevation seen. 39 cases (52%) raised AST, 31 cases (41%) has raised ALT. ALP- 10 cases (13%) showed elevation PT- 42/75 Cases showed raised PT (56%).

Severity of CCF- Serum bilirubin > 3 mg/dl shows severe CCF. Elevation in transaminases present in severe CCF with hypotension and shock. Also there is hypoalbuminemia and A/G reversal seen which has poor prognosis. 71% of cases shows abnormal LFTs in which p value was found significant (0.0003). Of 53 patients with abnormal LFTs, 47 achieved remission from CCF within 7 days. Exacerbation – of CCF seen in 6 cases showed elevation of markers as described above.

CONCLUSION

The commonest etiology of cases presenting with features of CCF to Navodaya Medical College is CHD.

LFT abnormalities were mostly present in patients with CAD(73%) and Rheumatic valvular heart disease(72%) developing heart failure

Liver function abnormalities were least in patient with hypertensive heart disease(57%) developing heart failure

The serum bilirubin, serum ALP and serum transaminases returned to normal with remission. Serum protein and PT did not change with remission

The serum bilirubin, enzymes and PT were elevated with exacerbation. Serum proteins did not show change with exacerbation.

Severe CCF with hypotension leads to a gross elevation of serum AST AND ALT.

Serum ALP elevation correlated with the presence of hepatomegaly.

Serum bilirubin at presentation of >5 mg, presence of hypoalbuminemia and A/G ratio reversal were associated with poor prognosis.

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