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Clinical Profile and Outcomes of Patients of Decompensated Chronic Liver Disease

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Abstract

Background: Decompensated chronic liver disease (DCLD) is a major cause of morbidity and mortality worldwide, with a significant burden in India. Understanding its clinical profile, aetiological spectrum, and mortality predictors is essential for improving the outcomes.

Methods: A prospective, observational study was conducted among 150 adults admitted with DCLD over 18 months. Demographic data, clinical features, laboratory parameters, and radiological findings were documented. Disease severity was classified using the Child-Pugh scoring system. In-hospital mortality was the primary outcome.

Results: The majority of patients were aged 41 - 50 years (51.3%) with male predominance (74.7%). Alcohol-related liver disease was the leading aetiology (44.7%), followed by hepatitis B (28.7%), hepatitis C (12.7%), and non-alcoholic fatty liver disease (9.3%). Most patients had Child-Pugh Class B (55.3%) or C (44.7%). Common presentations included moderate ascites (72%), jaundice (60.7%), splenomegaly (50.7%), and hepatic encephalopathy (39.4%). In-hospital mortality was 20.7%, significantly higher in Child-Pugh Class C (90.3%) versus Class B (9.7%, p <0.001). Mortality was highest in alcohol-related CLD (48.4%) but showed no significant association with aetiology (p = 0.763).

Conclusion: DCLD predominantly affects middle-aged males, with alcohol and hepatitis B virus as major aetiologies. Advanced disease (Child-Pugh Class C) strongly predicts in-hospital mortality, highlighting the need for early detection and intervention.

Key words: Decompensated chronic liver disease, alcohol-related liver disease, Hepatitis B, Hepatitis C, Child-Pugh class, in-hospital mortality.

Introduction

Decompensated chronic liver disease (DCLD) represents the advanced stage of chronic liver injury, characterised by complications including ascites, hepatic encephalopathy, variceal bleeding, and jaundice[1,2]. Decompensation is associated with increased morbidity and mortality[3].

Globally and in India, chronic liver disease remains a major public health concern. Indian hospital-based studies have consistently demonstrated that patients often present late[4]. Alcohol-related liver disease remains the predominant cause of cirrhosis and decompensation in most parts of India, reflecting rising alcohol consumption patterns[5,6]. Chronic viral hepatitis, particularly hepatitis B virus (HBV) and hepatitis C virus (HCV) infection, continues to contribute substantially to the disease burden, despite the availability of effective antiviral therapies[7].

Metabolic dysfunction-associated steatotic liver disease (MASLD) has emerged as an increasingly important aetiology of chronic liver disease in India, driven by the growing prevalence of obesity, diabetes mellitus, and metabolic syndrome[8]. Although MASLD-related cirrhosis constitutes a smaller proportion of hospitalised DCLD cases, its contribution is expected to rise in the coming years. Patients with DCLD frequently present with complications such as ascites, jaundice, upper gastrointestinal bleeding, infections, renal dysfunction, and hepatic encephalopathy, all of which adversely affect short-term outcomes[9].

Disease severity at presentation is a critical determinant of outcome in DCLD. Prognostic scoring systems such as the Child-Pugh classification are widely used to stratify disease severity and predict mortality. Multiple studies have demonstrated a strong association between higher Child-Pugh class and increased in-hospital and short-term mortality among patients with decompensated cirrhosis[10,11].

Data describing the clinico-etiological profile and short-term outcomes of DCLD patients from Central India remain limited. Given regional variations in aetiology and healthcare access, understanding local disease patterns is essential for improving patient management. The present study was therefore undertaken to evaluate the clinical profile,

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aetiological spectrum, and in-hospital outcomes of patients with decompensated chronic liver disease admitted to a tertiary care center in Central India, with particular emphasis on the relationship between disease severity and in-hospital mortality.

Material and Methods

This prospective, observational study was carried-out at the Department of Medicine at a tertiary care centre in Central India. The study was conducted over an 18-month period, from July 2023 to December 2024. The study protocol was approved by the Institutional Ethics and Scientific Committee, and all participants provided written informed consent in their native language.

A total of 150 patients admitted to the medical wards with a diagnosis of decompensated chronic liver disease (DCLD) were enrolled based on specific inclusion and exclusion criteria. The study included patients who were 18 years or older, had a confirmed diagnosis of DCLD, and were willing to provide informed consent. Patients under the age of 18, pregnant females, those with hepatocellular carcinoma or other malignancies, and individuals who declined to participate were excluded from the study.

Data collection involved a comprehensive evaluation of each participant upon admission. Demographic data such as age, sex, occupation, and place of residence were recorded. A detailed clinical history was taken to document presenting symptoms like jaundice, abdominal distension, gastrointestinal (GI) bleeding, and altered sensorium, along with risk factors such as alcohol use, intravenous drug use, and a history of blood transfusions. A thorough general and systemic examination was also performed, including the recording of vital signs and a detailed examination of the gastrointestinal, cardiovascular, respiratory, and central nervous systems.

Baseline laboratory and radiological investigations were conducted to support the clinical evaluation. Haematological tests included a complete blood count (CBC), Erythrocyte Sedimentation Rate (ESR), and C-Reactive Protein (CRP). Liver function was assessed through serum bilirubin, SGOT, SGPT, ALP, total protein, and albumin, while renal function was evaluated using blood urea and serum creatinine. Other key tests included serum electrolytes, urinary albumin, lipid profile, and PT/INR. Serological markers for Hepatitis B (HBsAg) and Hepatitis C (Anti-HCV) were also analysed. Radiological investigations included an abdominal ultrasound and a chest X-ray. For relevant cases, ascitic fluid was analysed to determine its nature and rule-out infection.

The prognosis and severity of the disease were assessed using the Child-Pugh scoring system, which integrated five key parameters: serum bilirubin, serum albumin, INR, and the presence of ascites and hepatic encephalopathy. The primary outcome measured was in-hospital mortality. Other outcomes assessed included the length of hospital stay, clinical improvement or deterioration, and the need for ICU admission or ventilatory support.

For statistical analysis, all collected data were tabulated in a master chart using Microsoft Excel. The analysis was performed using SPSS version 27.0. Quantitative variables were presented as mean ± standard deviation, while qualitative variables were summarised as frequencies and percentages. Appropriate statistical tests, including the chi-square test, were used to determine the significance of associations, with a p-value of less than 0.05 considered statistically significant.

Results

A total of 150 patients with chronic liver disease (CLD) were analysed to assess clinical profiles, aetiologies, and their association with in-hospital outcomes. The study population predominantly comprised Child-Pugh class B and C cases, with a notable proportion presenting with complications such as ascites and hepatic encephalopathy. Mortality patterns, aetiological distribution, and correlations with clinical severity were evaluated using appropriate statistical tests.

Table I: Baseline demographic, clinical, and laboratory characteristics of the study population (N = 150).

Age Group (years)	Frequency (n)	Percentage (%)
≤ 20	1	0.7
21 - 30	6	4
31 - 40	16	10.7
41 - 50	77	51.3
51 - 60	40	26.7
>60	10	6.7
Gender		
Female	38	25.3
Male	112	74.7
Co-morbid Conditions		
Absent	107	71.3
Hypertension	34	22.7
Diabetes Mellitus	22	14.7
Obesity	11	7.3
Hyperlipidaemia	6	4
History of Alcohol Consumption		

Absent	73	48.7
Present	77	51.3
H/O Blood Transfusion/ IV Drug Abuse/ High Risk Behaviour		
Absent	92	61.3
Blood Transfusion	41	27.3
High-Risk Occupation	8	5.3
IV Drug Abuse	5	3.3
IV Drug Abuse and Blood Transfusion	3	2
Present (unspecified high-risk behaviour)	1	0.7
HBsAg Status		
Non-reactive	106	70.7
Reactive	44	29.3
HCV Status		
Non-reactive	131	87.3
Reactive	19	12.7
Ascites		
Mild Ascites	5	3.3
Moderate Ascites	108	72
Gross Ascites	37	24.7
Splenomegaly		
Absent	74	49.3
Present	76	50.7
Jaundice		
Absent	59	39.3
Present	91	60.7
Upper GI Bleed		
Absent	86	57.3
Present	64	42.7
Encephalopathy		
Absent	91	60.7
Minimal	28	18.7
Advanced	31	20.7
Laboratory parameters	**Mean**	**Std. Deviation**
Haemoglobin (g/dL)	9.26	1.97
TLC (/µL)	10,318.05	4,511.32
Platelets (L/µL)	1.65	0.87
RBS (mg/dL)	143.55	51.37
Urea (mg/dL)	65.67	36.14
Creatinine (mg/dL)	1.51	0.86
PT (sec)	26.11	10.98
INR	1.74	0.34
Total Bilirubin (mg/dL)	5.14	10.15
Direct Bilirubin (mg/dL)	2.01	1.46
SGOT (U/L)	117.84	64.91
SGPT (U/L)	99.04	60.98
ALP (U/L)	149.48	84.72
Total Protein (g/dL)	5.7	0.73
Albumin (g/dL)	2.49	0.42
Serum Sodium (mmol/L)	133.74	5.73
Serum Potassium (mmol/L)	4.42	0.58

Table I summarises the baseline demographic, clinical, and laboratory characteristics of 150 patients with chronic liver disease (CLD). The majority of patients were aged 41 - 50 years (51.3%), with a male predominance (74.7%). Hypertension (22.7%) and diabetes mellitus (14.7%) were the most common co-morbidities. A history of alcohol consumption was present in 51.3% of cases, while 27.3% had a history of blood transfusion. Hepatitis B surface antigen (HBsAg) was reactive in 29.3% of patients, and hepatitis C virus (HCV) infection was reactive in 12.7%. Moderate ascites was the most frequent presentation (72%), with splenomegaly present in 50.7% and jaundice in 60.7%. Upper gastrointestinal (GI) bleed was observed in 42.7%, and hepatic encephalopathy in varying degrees was seen in 39.4% of patients (18.7% minimal, 20.7% advanced).

Laboratory investigations revealed anaemia (mean haemoglobin 9.26 ± 1.97 g/dL), thrombocytopenia (mean platelet count 1.65 ± 0.87 L/µL), elevated liver enzymes (SGOT 117.84 ± 64.91 U/L, SGPT 99.04 ± 60.98 U/L), hyperbilirubinaemia (mean total bilirubin 5.14 ± 10.15 mg/dL), hypoalbuminaemia (2.49 ± 0.42 g/dL), and hyponatraemia (mean sodium 133.74 ± 5.73 mmol/L).

Table II: Distribution of patients by aetiology, Child-Pugh class, and clinical outcome in chronic liver disease (N = 150).

Child-Pugh Class	Frequency (n)	Percentage (%)
A	0	0
B	83	55.3
C	67	44.7
Aetiology for CLD		
Autoimmune Hepatitis	5	3.3
HBV-Related	43	28.7
HCV-Related	19	12.7
Alcohol-Related	67	44.7
Wilson's Disease	1	0.7
Budd-Chiari Syndrome	1	0.7
MASLD Associated	14	9.3

Outcome		
Discharge	119	79.3
Death	31	20.7

More than half of the patients were classified as Child-Pugh Class B (55.3%), while 44.7% were in Class C; no patients belonged to Class A. Alcohol-related liver disease was the most common aetiology (44.7%), followed by HBV (28.7%) and HCV (12.7%). MASLD (9.3%) and autoimmune hepatitis (3.3%) contributed to a smaller proportion, whereas Wilson's disease and Budd-Chiari syndrome each accounted for 0.7%. The majority of patients (79.3%) were discharged, while 20.7% succumbed to the disease (Table II).

Table III: Association between Child-Pugh class and in-hospital mortality (N = 150).

Child-Pugh Class	Death n (%)	Discharge n (%)	Total n (%)	p value
A	0 (0.0)	0 (0.0)	0 (0.0)	**<0.001**
B	3 (9.7)	80 (67.2)	83 (55.3)	
C	28 (90.3)	39 (32.8)	67 (44.7)	
Total	31 (100)	119 (100)	150 (100)	

In-hospital mortality was significantly higher among patients with Child-Pugh Class C (90.3%) compared to Class B (9.7%), while no deaths occurred in Class A. The association between Child-Pugh class and mortality was statistically significant (p <0.001) (Table III).

Table IV: Association between aetiology of chronic liver disease and in-hospital outcome (N = 150).

Aetiology of CLD	Death n (%)	Discharge n (%)	Total n (%)	p value
Alcohol Related	15 (48.4)	52 (43.7)	67 (44.7)	0.763
Autoimmune Hepatitis	1 (3.2)	4 (3.4)	5 (3.3)	
Budd-Chiari Syndrome	0 (0.0)	1 (0.8)	1 (0.7)	
HBV-Related	7 (22.6)	36 (30.3)	43 (28.7)	
HCV-Related	3 (9.7)	16 (13.4)	19 (12.7)	
MASLD-Associated	5 (16.1)	9 (7.6)	14 (9.3)	
Wilson's Disease	0 (0.0)	1 (0.8)	1 (0.7)	
Total	31 (100)	119 (100)	150 (100)	

Alcohol-related CLD (44.7%) and HBV-related CLD (28.7%) were the most common aetiologies among the study participants. Mortality was highest in alcohol-related CLD (48.4%), followed by HBV-related (22.6%) and MASLD-associated cases (16.1%). However, the association between aetiology and in-hospital outcome was not statistically significant (p = 0.763) (Table IV).

Discussion

The present study evaluated the clinico-aetiological profile and in-hospital outcomes of 150 patients with decompensated chronic liver disease admitted to a tertiary care center in Central India. The majority of patients were middle-aged, with peak incidence in the 41 - 50 year age group, and a marked male predominance. Similar age and sex distributions have been reported in earlier Indian studies, highlighting that DCLD predominantly affects males in their economically productive years[4,5].

Alcohol-related liver disease was the most common aetiology in the present cohort, accounting for nearly half of all cases, followed by HBV- and HCV-related chronic liver disease. This aetiological pattern closely mirrors findings from other Indian hospital-based studies, where alcohol has consistently emerged as the leading cause of cirrhosis and decompensation[6,7]. MASLD constituted a smaller but significant proportion of cases, reflecting the rising burden of metabolic liver disease in India[8].

Ascites was the most frequent clinical manifestation observed in this study, followed by jaundice, splenomegaly, upper gastrointestinal bleeding, and hepatic encephalopathy. Similar clinical profiles have been documented in previous studies, underscoring the central role of portal hypertension and reduced hepatic reserve in the pathophysiology of decompensated cirrhosis[9].

In-hospital mortality in the present study was 20.7%, which is comparable to mortality rates reported in other Indian and Asian studies of hospitalised DCLD patients[10]. Mortality was significantly higher among patients with Child-Pugh Class C disease compared to those with Class B disease, reaffirming the prognostic value of the Child-Pugh classification in predicting short-term outcomes. Similar associations between advanced Child-Pugh class and increased mortality have been consistently demonstrated in earlier studies[11].

Although mortality was numerically higher among patients with alcohol-related liver disease, no statistically significant association was observed between aetiology and in-hospital outcome. This finding suggests that disease severity at presentation, rather than underlying aetiology alone, plays a more decisive role in determining short-term prognosis[11].

The findings of this study emphasize the ongoing burden of alcohol- and viral hepatitis-related liver disease in Central India and highlight the importance of early diagnosis, aetiological treatment, and timely referral before the onset of advanced decompensation. Public health strategies focusing on alcohol moderation, viral hepatitis screening and treatment, and metabolic risk factor control are essential to reduce progression to decompensated cirrhosis and improve patient outcomes.

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