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Clinical Profile and ALBI Score-Based Assessment of Decompensated Chronic Liver Disease with Varied Complications : A Case Series

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ABSTRACT :

Background:

Decompensated Chronic Liver Disease (DCLD) represents the advanced stage of chronic liver injury, characterized by complications such as ascites, hepatic encephalopathy, variceal bleeding, and jaundice. Accurate assessment of liver function is crucial for prognosis. The Albumin-Bilirubin (ALBI) score, an objective and validated tool, uses only serum albumin and bilirubin levels to grade liver dysfunction, offering advantages over traditional scoring systems.

Objective:

To evaluate the severity of liver dysfunction in DCLD patients using the ALBI grading system and to analyze age distribution, alcohol history, and associated comorbidities.

Methods:

A case series was conducted at the Department of Medicine, Government Medical College, Nagapattinam, from November to December 2024, involving 10 male patients diagnosed with DCLD. Clinical details, alcohol history, comorbidities, and laboratory parameters (albumin and bilirubin) were collected. ALBI scores were calculated using the standard formula and classified into Grades 1–3. Descriptive statistics were applied for analysis.

Results:

The mean age was 49.3 years (range: 28–74), with 60% in the 40–59 years group. Alcohol history was present in 60% of cases. Common comorbidities included systemic hypertension (20%), anemia (20%), and ascites (20%). ALBI grading revealed Grade 1 in 2 patients (20%), Grade 2 in 1 patient (10%), and Grade 3 in 7 patients (70%), indicating severe liver dysfunction in the majority.

Conclusion:

This case series highlights that most DCLD patients present with advanced liver dysfunction (ALBI Grade 3), predominantly in middle-aged males with a significant history of alcohol use. The ALBI score is a practical, objective tool for assessing hepatic function in DCLD and can guide prognosis and management. Clinical pharmacists play an essential role in multidisciplinary care through dietary counselling, alcohol cessation support, and medication support.

Keywords:
Decompensated Chronic Liver Disease, ALBI Score, Alcoholic Liver Disease, Comorbidities, Clinical Pharmacist Intervention

INTRODUCTION

Cirrhosis and its complications are the ultimate result of chronic liver disease (CLD), a progressive illness marked by the slow deterioration of the liver parenchyma over months to years. Ascites , hepatic encephalopathy , variceal bleeding or jaundice are signs of liver decompensation , which is known as decompensated chronic liver disease (DCLD). This condition has a poor prognosis and has a major impact on survival and quality of life [1].

The non alcoholic fatty liver disease (NAFLD),chronic viral hepatitis (HBV, HCV)and alcoholic liver disease (ALD) are the three main causes of CLD worldwide, with alcohol playing significant role in developing nations . The natural history of cirrhosis is complex and often worsened by comorbidities such as anemia, hypertension, infections, thrombocytopenia, and renal dysfunction, which accelerate hepatic decompensation and increase hospitalization rates[3].

Traditionally, scoring systems such as Child-Pugh and MELD have been used to assess liver function. An objective measure of hepatic function using only serum albumin and bilirubin has recently been validated, known as the Albumin-Bilirubin (ALBI) score.[4]. It stratifies liver dysfunction into three grades, correlating well with clinical outcomes in both cirrhotic and hepatocellular carcinoma populations. The development of chronic liver disease to decompensation greatly increases mortality risk and healthcare burden[5]

In this case series, we present 10 male patients diagnosed with DCLD, assessed using the ALBI grading system. We aim to highlight the distribution of liver dysfunction severity, age demographics, alcohol history, and associated comorbidities, providing insight into the clinical spectrum of DCLD and emphasizing the utility of the ALBI score in real-world hospital settings.

METHODOLOGY :

This case series was conducted in the Department of Medicine at Government Medical College , Nagapattinam over a period of two month , from November to December 2024. Only patients diagnosed with decompensated chronic liver disease were included.

Inclusion criteria

1. Age greater than 18 years
2. Availability of serum albumin and total bilirubin for calculating ALBI score.
3. Willingness to participate

Exclusion Criteria

1. Patients with Acute Liver failure
2. Patients with hepatocellular carcinoma or other malignancies.
3. Incomplete lab data. (no albumin or bilirubin values)

Study Population

Patients aged 18 years and above who were diagnosed with Decompensated Chronic Liver Disease (DCLD) were included. DCLD was diagnosed based on clinical presentation, biochemical investigations, and radiological evidence of chronic liver injury with at least one decompensation event such as ascites, hepatic encephalopathy, variceal bleeding, or jaundice.

Data Collection

Demographic data (age, gender), clinical presentation, history of alcohol intake or viral hepatitis, comorbidities (e.g., diabetes, hypertension), and details of decompensation were collected. Laboratory investigations including serum albumin and total bilirubin were obtained from patient records at the time of admission.

Statistical Analysis

Descriptive statistics were used to summarize the data.Percentages were calculated based on the total number of patients (n = 10).

ALBI Grading System

We observed 10 male patients with DCLD admitted to a tertiary care hospital. Their clinical details, albumin, and bilirubin levels were recorded. ALBI scores were calculated using the formula:

ALBI Score = (log10 bilirubin × 0.66) + (albumin × -0.085)

(Bilirubin in µmol/L, Albumin in g/L)

ALBI Score Range	ALBI Grade	Interpretation
≤ –2.60	Grade 1	**Good liver function** (mild dysfunction)
> –2.60 to ≤ –1.39	Grade 2	**Moderate liver dysfunction**
> –1.39	Grade 3	**Severe liver dysfunction**

This case series includes 10 male patients aged between 28 and 74 years, all diagnosed with decompensated chronic liver disease (DCLD).

Age Distribution of DCLD Cases (n = 10)

Age Group (Years)	Number of Cases	Percentage (%)
20–29	1	10%
30–39	2	20%
40–49	3	30%
50–59	3	30%
70–79	1	10%

Observation:

- Most patients (60%) fall within the 40–59 years age range.
- Only one patient was elderly (74 years).
- One patient was in the younger age group (28 years), indicating that DCLD can occur even in younger adults, especially in alcohol-related or hepatitis-related liver damage.

Distribution of Comorbidities in DCLD Patients

Comorbidity	Number of Cases	Percentage (%)
Systemic Hypertension	2	20%
Anemia	2	20%
Ascites	2	20%
Portal Hypertension	1	10%
Spontaneous Bacterial Peritonitis (SBP)	1	10%
Acute Pancreatitis	1	10%
Thrombocytopenia	1	10%
Hepatitis	1	10%
Cholelithiasis	1	10%
Psoas Abscess	1	10%
Volume Overloaded State	1	10%

Observations:

- A history of alcohol use was reported in 60% of the patients, reinforcing its role as a major risk factor for DCLD[1].
- Systemic hypertension and anemia were the most common comorbidities.
- Severe complications like SBP, ascites, and portal hypertension indicate advanced liver disease progression.

Case presentation :

A total of 10 male patients aged between 28 to 74 years were included in this case series, all diagnosed with decompensated chronic liver disease (DCLD). ALBI (Albumin-Bilirubin) scores were calculated to assess liver function. Based on the ALBI grading system:

Case	Age/ Sex	Albumin (g/dL)	Bilirubin (mg/dL)	ALBI Score	ALBI Grade	Liver Function	Associated Comorbidity
1	38/M	2.2	4.25	-0.641	Grade 3	Severe Dysfunction	Cirrhotic ascites
2	49/M	2.2	8.40	-0.446	Grade 3	Severe Dysfunction	Hepatitis
3	43/M	3.91	0.65	-3.324	Grade 1	Good Function	Systemic hypertension
4	74/M	3.2	0.74	-1.993	Grade 2	Moderate Dysfunction	Anemia, systemic hypertension
5	50/M	2.3	2.0	-0.943	Grade 3	Severe Dysfunction	Cholelithiasis, thrombocytopenia, acute pancreatitis
6	57/M	2.3	5.31	-0.663	Grade 3	Severe Dysfunction	Spontaneous bacterial peritonitis (SBP)
7	54/M	1.8	15.45	0.067	Grade 3	Severe Dysfunction	Portal hypertension, anemia
8	28/M	2.2	0.79	-1.123	Grade 3	Severe Dysfunction	Volume overload
9	43/M	1.5	2.28	-2.775	Grade 1	Good Function	Ascites
10	31/M	1.5	0.38	0.739	Grade 3	Severe Dysfunction	Psoas abscess

Observation :

- Grade 1 (Good Function) was observed in 2 patients (20%)
- Grade 2 (Moderate Dysfunction) in 1 patient (10%)
- Grade 3 (Severe Dysfunction) in 7 patients (70%)

DISCUSSION

In this case series of 10 male patients with Decompensated Chronic Liver Disease (DCLD), a detailed analysis of age distribution, alcohol history, and comorbidities was performed to better understand the clinical spectrum.

Age Distribution

The majority of patients (60%) were between 40 and 59 years of age, indicating that DCLD most frequently manifests in middle-aged adults, consistent with previous reports[6]. One patient was aged 28, which highlights that younger individuals are not exempt, especially in settings with high alcohol consumption or viral hepatitis prevalence.

Alcohol History

A history of alcohol consumption was reported in 60% of cases. This reinforces that alcohol remains a dominant and preventable cause of chronic liver disease, especially in developing countries where awareness and early screening are lacking[2]. Chronic alcohol use induces hepatic steatosis, fibrosis, and ultimately cirrhosis, contributing significantly to the burden of DCLD[8] **Comorbidities**

The most frequently observed comorbidities in this series were:

- Systemic hypertension (20%)
- Anemia (20%)
- Ascites (20%)
- Other complications included portal hypertension, spontaneous bacterial peritonitis (SBP), thrombocytopenia, acute pancreatitis, psoas abscess, and volume overload states.

These findings are in line with other studies showing that extra-hepatic comorbidities and portal complications are common in DCLD and significantly worsen the prognosis [9, 10]

- Ascites and SBP, observed in several patients, are hallmark features of decompensated cirrhosis and require immediate intervention to reduce mortality [11]
- The occurrence of thrombocytopenia, portal hypertension, and psoas abscess reflects multiorgan involvement and immune compromise in advanced liver disease.
- The co-occurrence of cholelithiasis and pancreatitis in one patient reflects overlapping risk profiles, particularly with alcohol use .[12]

Multiple comorbidities highlight the value of multidisclipinary approach to managing DCLD because these are frequently determine the long -term quality of life, hospitalisation and outcomes.

The ALBI score is an objective, evidence-based model used to assess liver dysfunction using serum albumin and bilirubin values. It independent of subjective assessments like ascites or encephalopathy included in the Child-Pugh Score. [11]

- Case 1 and Case 2 showed Grade 3 ALBI scores, despite being younger (38 and 49 years). Both had significantly elevated bilirubin levels and low albumin, reflecting advanced liver dysfunction. This supports findings from studies where ALBI Grade 3 is associated with poor prognosis and higher risk of hepatic decompensation [12]
- Case 3 and Case 9, however, demonstrated Grade 1 liver function with high albumin and low bilirubin levels, despite the presence of comorbidities like systemic hypertension and ascites. This underlines the sensitivity of ALBI in early identification of preserved liver function, even among DCLD Patients [13].
- Case 4 had Grade 2 dysfunction, highlighting the ALBI score's ability to stratify intermediate-risk patients, which is clinically valuable for decisions regarding monitoring intensity and therapy escalation.
- A notable case, Case 10, had Grade 3 dysfunction despite low bilirubin, but the albumin was critically low (1.5 g/dL), emphasizing that hypoalbuminemia alone can drive a high ALBI score, reinforcing its multifactorial interpretation.

The prevalence of ALBI Grade 3 (70%) in this series suggests late-stage liver dysfunction in most patients, possibly due to delayed diagnosis or advanced disease at presentation. This aligns with literature indicating that in resource-limited settings, DCLD patients often present with severe biochemical abnormalities and complications like portal hypertension, spontaneous bacterial peritonitis, and ascites [12][1

Management

Complication-Specific

- Ascites: Sodium restriction; start spironolactone 100 mg/day ±furosemide 40 mg/day (maintain ~100:40 ratio); for tense ascites, large-volume paracentesis with albumin (≈8 g/L removed). [20]
- Hepatic encephalopathy (HE): Lactulose (titrate to 2–3 soft stools/day); rifaximin 550 mg bid for secondary prophylaxis/recurrence; always search for and treat precipitants. [21]
- Variceal bleeding / prophylaxis: Acute bleed—vasoactive therapy (terlipressin or octreotide) + EVL and antibiotics; secondary prevention—NSBB (e.g., propranolol/carvedilol) + EVL. For primary prophylaxis in medium/large varices: NSBB or EVL per risk profile;
- Spontaneous bacterial peritonitis (SBP): Empiric cefotaxime (e.g., 2 g IV q8h) or ceftriaxone; secondary prophylaxis (e.g., norfloxacin) after recovery. [20]

ALBI Grade–Wise Management in Decompensated Chronic Liver Disease [4][9][21]

Grade 1 – Good Hepatic Reserve

- Treat underlying cause (HBV/HCV antivirals, alcohol cessation, autoimmune hepatitis therapy)
- Nutritional optimization: 1.2–1.5 g/kg/day protein
- Manage early complications (mild ascites, small varices)
- Routine monitoring: LFT, INR, ALBI score, HCC screening every 6 months

Grade 2 – Moderate Impairment

- Aggressive complication control (ascites, HE, varices)
- Early screening & prophylaxis for variceal bleeding (NSBB or EVL)
- Infection prevention (vaccination, SBP prophylaxis if indicated)
- Early liver transplant evaluation

Grade 3 – Severe Impairment

- Urgent referral for transplant evaluation
- Intensive management of complications (SBP, HE, HRS)
- Frequent monitoring (weekly or bi-weekly if unstable)
- Palliative/supportive care discussions if not a transplant candidate

Clinical Pharmacist Intervention

Clinical pharmacists play a vital role in the multidisciplinary management of patients with decompensated chronic liver disease (DCLD), improving therapeutic outcomes, reducing medication-related problems, and supporting patient education.

Diet and Nutrition [14]

- Advised to take high-protein (1.2–1.5 g/kg/day) and high-calorie (35–40 kcal/kg/ day) meals.
- Sodium restriction (≤2 g/day) was advised due to presence of ascites.

Mental Health and Supportive Care [16]

- Counselled about possible mood changes, depression, or anxiety due to chronic illness.
- Referred to mental health support and encouraged open communication with caregivers.

Fluid Restriction [15]

Fluid restriction (1–1.5 L/day) may be advised in patients with hyponatremia (serum sodium <125 mmol/L.

Avoid Straining or Heavy Lifting

Patients with varices or large ascites should avoid straining during defecation, heavy lifting, or vigorous exercise to prevent variceal bleeding or hernia formation.

Lactulose Compliance for Hepatic Encephalopathy

- Lactulose helps reduce ammonia absorption by altering gut pH and improving bowel movements.
- Take lactulose regularly as prescribed (usually 2–3 times/day).
- The goal is to pass 2–3 soft stools daily – not diarrhea.
- Encourage hydration to prevent dehydration from overuse.

Low-Sodium Diet (≤2g/day)

- Sodium contributes to fluid retention and worsens ascites and edema.
- Dietary sodium restriction improves response to diuretics and helps control abdominal distension.
- Limit table salt, processed foods, canned items, pickles, papads, and salted snacks.
- Encourage home-cooked, fresh meals.
- If they find food bland, suggest natural flavor enhancers (e.g., lemon juice, herbs). **Alcohol Abstinence**
- Patients should be strongly advised to stop alcohol completely.
- Educate on the long-term benefits of abstinence, such as reduced risk of liver cancer and improved survival.

Immunization Review and Recommendations[17]

- Patients with liver disease are at higher risk for severe infections.
- Pharmacists can recommend and facilitate immunization for:
  - Hepatitis A and B

- Pneumococcal vaccine
- Influenza and COVID-19

Nutrition and Supplement Review [18]

- Identify and correct deficiencies of:
  - Zinc (especially in hepatic encephalopathy)
  - Vitamin D, Thiamine, Folate, Magnesium
  - Protein intake: Encourage 1.2–1.5 g/kg/day unless HE is uncontrolled.

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