Section: General Medicine

Original Research Article

A HOSPITAL-BASED STUDY ON CLINICAL, ETIOLOGICAL AND SOCIODEMOGRAPHIC PROFILE OF LIVER CIRRHOSIS PATIENTS IN HALDWANI

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ABSTRACT

Background: Aim: Liver cirrhosis imposes a major clinical and public-health burden in India. This study aimed to describe the Clinico-Etiological and Sociodemographic profile of cirrhosis patients attending Dr. Sushila Tiwari Government Hospital, Haldwani.

Materials and Methods: The present study is a hospital-based observational cross-sectional study on 151 consecutively enrolled patients with liver cirrhosis at a tertiary center in Haldwani over 18 months following institutional ethics approval and written informed consent. Data included detailed sociodemographics, alcohol history, viral hepatitis serology (HBsAg, anti-HCV), laboratory parameters (CBC, PT/INR, LFTs, renal function, electrolytes), abdominal ultrasonography, and upper-GI endoscopy; descriptive statistics were applied.

Results: A total of 151 patients were studied; 80.8% were male and most were aged 41–60 years. The majority were from rural areas and lower-middle socioeconomic class. Alcohol was the leading cause of cirrhosis (56.3%), followed by hepatitis C (19.9%) and hepatitis B (9.3%); NASH contributed 10.6%. The commonest presentation was ascites (97.4%), followed by hepatic encephalopathy (50.3%) and acute kidney injury (36.4%). Endoscopy showed varices in over 80% of patients. In-hospital complications occurred in nearly one-third, with a mortality of 13.9%.

Conclusion: Liver cirrhosis in this region mainly affects middle-aged rural men from lower socioeconomic backgrounds, with alcohol and viral hepatitis as leading causes. Most patients present late with complications, highlighting the need for early detection, preventive strategies, and improved management services.

Keywords: Liver Cirrhosis, CTP Score, Hepatitis, Endoscopy.

INTRODUCTION

Liver cirrhosis is the end result of chronic liver injury that produces widespread fibrosis and regenerative nodules, leading to architectural distortion and progressive impairment of hepatic function. Cirrhosis represents a final common pathological pathway for a heterogeneous group of hepatobiliary disorders and is clinically important because of its high morbidity, risk of decompensation, and substantial contribution to global mortality and disability.[1]

Globally, chronic liver disease and cirrhosis remain leading causes of years of life lost and disability-adjusted life years, with major regional variation in etiology and outcomes.[2] Population-level analyses have documented a shifting epidemiology over recent decades: viral hepatitis, hazardous alcohol use, and the rising prevalence of nonalcoholic fatty liver disease and nonalcoholic steatohepatitis are the principal drivers of cirrhosis burden in many

settings.[3] These changing patterns have important implications for prevention, screening, and health-service planning because the dominant causes vary by geography, socioeconomic status, and access to care.

In the Asia–Pacific region and in India specifically, the spectrum of liver disease shows both similarities and local distinctions: hepatitis B and alcohol remain major contributors in many areas, while hepatitis C and metabolic liver disease have risen in importance in some populations. The region's heterogeneity is shaped by differences in vaccination coverage, viral-control programs, alcohol consumption patterns, urbanization and metabolic risk factors, and by variability in health-care access between urban and rural communities.[4] For policy and clinical practice, these regional patterns underscore the need for locally relevant data to guide screening priorities and resource allocation.

Cirrhosis is clinically significant because of its complications—portal hypertension with variceal hemorrhage, ascites with spontaneous bacterial peritonitis, hepatic encephalopathy, hepatorenal syndrome, and the risk of hepatocellular carcinoma—all of which drive hospital admissions, prolonged hospital stays, and increased in-hospital mortality.[5] Early identification of at-risk patients, timely management of complications, and implementation of secondary-prevention measures such as endoscopic surveillance and variceal prophylaxis are central to reducing adverse outcomes. These clinical management principles are well established, but their application in district and peripheral hospitals can be constrained by limited diagnostic and therapeutic capacities, further magnifying the need for context-specific evidence.[6]

Socioeconomic and demographic determinants materially influence both disease occurrence and outcomes. Lower socioeconomic status, rural residence, limited health literacy, and occupational exposures may delay presentation and restrict access to antiviral therapy, alcohol-deaddiction services, and endoscopic care; consequently, patients commonly present with decompensated disease in resource-limited settings. Regional hospital-based series from India and neighboring countries consistently report a predominance of middle-aged men, a high prevalence of alcohol-related cirrhosis, and frequent presentation with ascites and variceal disease—findings that highlight gaps in primary prevention, hepatitis control, and early detection.[7]

Given this background, there is a clear need for hospital-level studies that describe the clinico-etiological spectrum and sociodemographic profile of cirrhosis in specific districts and states. Regionally precise data permit targeted public-health interventions (for example, vaccination, hepatitis C case-finding and treatment, and alcohol-harm reduction), inform capacity building (endoscopy, paracentesis, intensive care), and support the development of referral pathways tailored to local resource constraints. The present study, conducted at Dr. Sushila Tiwari Government Hospital, Haldwani, aims to fill this local evidence gap by systematically describing the clinical features, underlying causes, and sociodemographic characteristics of hospitalized cirrhosis patients in the Kumaon region, thereby providing an evidence base for context-appropriate prevention and care strategies.[8]

In summary, cirrhosis remains a leading cause of preventable morbidity and mortality; its multifactorial etiology and the strong imprint of sociodemographic determinants make local epidemiologic description essential for effective public-health planning. This paper presents a focused, hospital-based analysis intended to inform clinicians, hospital administrators, and public-health practitioners working in similar low- and middle-income settings.

Mukherjee et al. (2017),[9] in a multicentric Indian study found alcohol to be the most common cause of cirrhosis with significant regional variation, with nearly one-third of chronic liver disease patients presenting in a decompensated state. Tewari et al. (2023),[10] in a systematic review and meta-analysis of Indian studies, reported that alcohol accounted for approximately 43% of cirrhosis cases, with rising contributions from nonalcoholic fatty liver disease and declining cases due to viral hepatitis. Mishra et al. (2020),[11] analyzed 4,331 hospitalized cirrhosis patients in coastal Eastern Odisha and demonstrated a temporal increase in alcohol-related cirrhosis alongside a reduction in viral-hepatitis-related disease. Kaur et al. (2021),[12] in a hospital-based study from North India, reported alcohol as the etiology in nearly 80% of patients, with most presenting in advanced Child–Pugh C stage. Goyal et al. (2018),[13] in a tertiary-care institute study in northern India, identified alcohol as the predominant cause of cirrhosis and detailed consistent clinical and laboratory profiles. Maitra et al. (2019),[14] from Gauhati Medical College in North-East India, found alcohol to be the leading cause (62.5%) and observed high frequencies of ascites, varices, and notable in-hospital mortality.

MATERIALS AND METHODS

This hospital-based cross-sectional observational study was conducted in the Department of General Medicine, Dr. Susheela Tiwari Memorial Government Hospital, Government Medical College, Haldwani, Nainital, Uttarakhand. The study was carried out over a period of eighteen months and included a total of 151 patients diagnosed with liver cirrhosis. Approval from the Institutional Ethics Committee was obtained before initiating the study, and written informed consent was taken from all participants after explaining the nature and purpose of the study. Confidentiality of patient information was maintained throughout, and all

patients continued to receive routine clinical care irrespective of their study participation.

Patients were enrolled consecutively from both outpatient and inpatient services of the Department of General Medicine. Those included in the study were individuals aged 16 years or above with a clinical or investigational diagnosis of liver cirrhosis who consented to participate. Patients below the age of 16 years and those unwilling to provide written informed consent were excluded from the study. Data were recorded on a predesigned and pretested proforma, which collected information on sociodemographic characteristics such as age, sex, education, occupation, residence, and socioeconomic status, along with relevant history, clinical features, examination findings, investigation results, complications, and outcomes. Particular attention was paid to history of alcohol consumption, comorbidities, previous hospitalizations, and presenting symptoms. Clinical evaluation included a detailed systemic examination performed by the investigators.

Investigations were carried out in the institutional laboratories and included complete blood counts, liver function tests, renal function tests, serum electrolytes, lipid profile, and coagulation profile. Specific etiological workup consisted of hepatitis B surface antigen, anti-hepatitis C virus antibody, and other tests such as autoimmune serology, serum ceruloplasmin, urinary copper, and iron studies when indicated. Radiological investigations included abdominal ultrasonography and computed tomography when required. Upper gastrointestinal endoscopy was performed to evaluate the presence and grade of varices and portal hypertensive gastropathy. In selected patients, liver biopsy was performed to confirm diagnosis, especially in those suspected to have nonalcoholic steatohepatitis or autoimmune hepatitis.

The diagnosis of cirrhosis was made on the basis of a combination of clinical, biochemical, radiological, endoscopic, and histological findings, as appropriate. Etiological classification was based on clinical history, serology, and specific diagnostic criteria. Complications such as ascites, hepatic encephalopathy, spontaneous bacterial peritonitis, hepatorenal syndrome, gastrointestinal bleeding, and hepatocellular carcinoma were carefully recorded during the hospital stay. All data were entered and analyzed using Microsoft Excel. Descriptive statistics were applied, and the findings were presented as frequencies, percentages, means, and standard deviations wherever applicable. The outcomes of patients at discharge, including survival, referral, or death, were documented, and complications occurring during hospitalization were analyzed.

RESULTS & DISCUSSION

The study marked a marked male predominance where out of a total of 151 patients, 122 (80.8%) were male and 29 (19.2%) were female. The majority of patients (75 out of 151) belonged to the 41–60 years age group, with a notable male predominance (64 males vs. 11 females). The second most affected group was 21–40 years, followed by 61–80 years. Very few cases were seen in the extremes of age (0–20 and 81+ years). Overall, male patients (122) vastly outnumbered female patients (29), suggesting that middle-aged males form the highest burden of liver disease at this center.

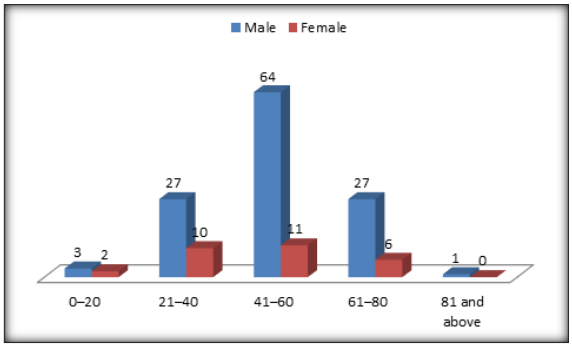

Figure 1: Age-wise and Gender-wise Distribution of Liver Disease Patients

Nearly 7% of patients were illiterate or had only primary education, and the largest single group (25.8%) had completed high school. These findings are similar to those of Borse et al. (2015), who reported that 30% of their liver disease patients had education up to primary level only.[15] Lower education is linked with poorer health literacy, late symptom recognition, and delayed healthcare access.

Specifically, 11 patients (7.3%) were illiterate, while 13 (8.6%) had received only primary education, and 19 (12.6%) had studied up to middle school. This means that nearly 43 patients (28.5%) had either no formal education or limited schooling.

Out of the total 151 patients, 95 (62.9%) were from rural areas while 56 (37.1%) belonged to urban regions. This indicates a clear predominance of cases among the rural population. This is presented in Figure 2.

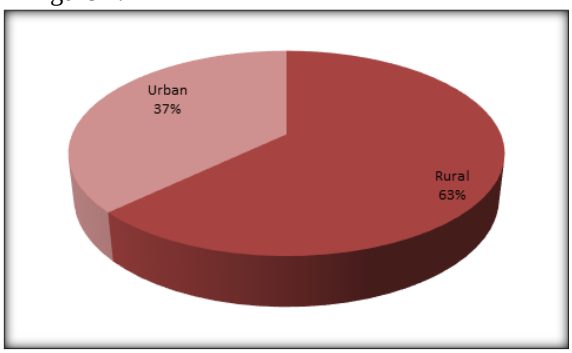

Figure 2: Distribution of Patients Based on Area of Residence

Lower-middle class patients formed the majority (62.3%), followed by upper-middle class 87 (25.2%). Lower-class representation was 11.9%. Similar trends were reported by Das et al. (2012), where lower and lower-middle socioeconomic groups comprised over 70% of liver disease cases.[16]

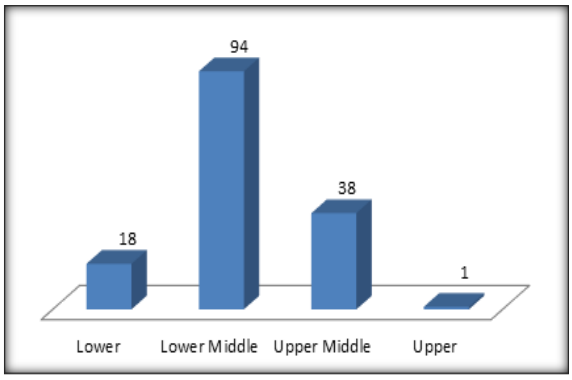

Figure 3: Social Class Distribution of Study Population

On analysing the presenting complaints, it was revealed that ascites was the most common finding, present in 147 individuals, accounting for 97.4% of the study population. This is depicted by Table 2. [Table 3]

Spontaneous bacterial peritonitis (SBP), a known complication of ascites, was found in 49 patients, representing 32.5%. This suggests that nearly one-third of those with ascites had progressed to this serious infectious complication. Hepatic encephalopathy was observed in 76 patients, making up 50.3% of the total population. This indicates that about half of the patients experienced neuropsychiatric manifestations of liver dysfunction, ranging from confusion to coma, which significantly impacts prognosis and quality of life. Acute kidney injury and hepatorenal syndrome (AKI/HRS) were present in 55 patients, accounting for 36.4%. These findings reflect the high burden of renal complications in patients with advanced liver disease. Jaundice was present in 29 patients, or 19.2%, suggesting that although it is a classic symptom of liver dysfunction, not all patients exhibited clinically visible jaundice at the time of evaluation. Upper gastrointestinal bleeding occurred in 43 patients (28.5%), indicating a substantial risk of variceal or mucosal bleeding in this group. Hepatocellular carcinoma (HCC) was found in only 3 patients, comprising just 2% of the study population. This low prevalence may suggest that most patients were in earlier stages of disease progression with cirrhosis but had not yet developed malignant transformation, or that screening practices limited its detection.

In our study, alcohol was the most common etiological factor, found in 56.3% of cases. This is consistent with Suthar et al. (2019), who reported ALD in 54% of cirrhotics in Gujarat.[17] A small subset (3.3%) were ex-alcoholics who had quit drinking over 15 years ago.

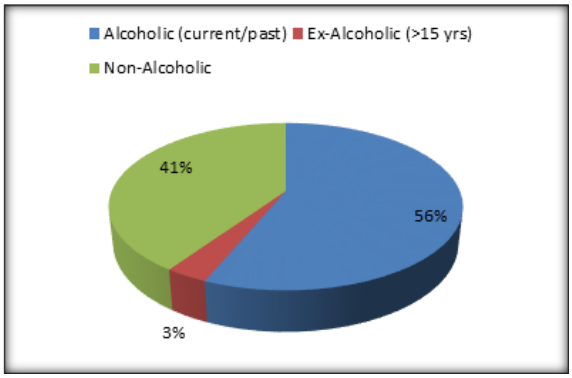

Figure 4: Distribution of Alcohol Consumption

The combined analysis of viral hepatitis markers among the 151 patients with liver cirrhosis provides important insight into the etiological role of chronic viral infections in this population. The data show that 14 patients, accounting for 9.3%, were positive for hepatitis B surface antigen (HBsAg), suggesting chronic hepatitis B virus (HBV) infection as the underlying cause of cirrhosis in this subgroup. This is presented by Table 3. [Table 3]

30 patients or 19.9%, were found to be positive for anti-HCV antibodies, indicating exposure to hepatitis C virus (HCV) and likely chronic infection. This suggests that hepatitis C is more prevalent than hepatitis B among cirrhotic patients in this study.

The analysis of non-viral, non-alcoholic causes of liver cirrhosis in the present study reveals that a small proportion of patients were affected by these less common etiologies as presented by table 4. Among the 151 patients, 16 individuals (10.6%) were found to have non-alcoholic steatohepatitis (NASH) as the underlying cause of cirrhosis. This indicates that NASH is an emerging contributor to chronic liver disease.

Only one patient (0.7%) was diagnosed with autoimmune hepatitis, and one with Wilson's disease (0.7%). These conditions are relatively rare and often require specialized investigations for diagnosis.

In this study, the majority of patients (68.2%) did not develop any in-hospital complications during their stay, suggesting either early-stage disease, effective supportive care, or short duration of admission, as presented by Table 5. Shock was the most frequent complication (11.9%), often observed either independently or in conjunction with other issues like gastrointestinal bleeding or renal failure.

Acute kidney injury, including hepatorenal syndrome, was seen in 11.3% of patients, which is consistent with its known role as a major cause of morbidity in cirrhosis. Upper gastrointestinal bleeding was reported in 3.3% of patients, highlighting the burden of portal hypertension and variceal bleeding in cirrhotics. Other rare but important complications included metabolic acidosis

and worsening jaundice, each in about 0.7% of patients, possibly reflecting severe systemic decompensation or multi-organ failure. [Table 4]

The mean hemoglobin level among the patients was 9.32 g/dL, which indicates that most of the patients were anemic. The average prothrombin time was 24.59 seconds, and the mean INR was 2.00. These prolonged values suggest impaired liver synthetic function, as the liver is responsible for producing clotting factors. Such derangements increase the risk of bleeding complications. The mean total protein level was 7.21 g/dL, which is within the normal range; however, the average albumin was low at 2.70 g/dL. [Table 5]

The average total bilirubin level was 5.11 mg/dL, with direct bilirubin at 3.21 mg/dL and indirect bilirubin at 2.10 mg/dL. Elevated bilirubin levels suggest significant cholestasis or hepatocellular dysfunction. Liver enzymes were also markedly elevated, with SGOT averaging 148.49 U/L and SGPT at 74.20 U/L. This pattern, where SGOT is higher than SGPT, is typical in alcoholic liver disease but may also occur in advanced liver dysfunction due to mitochondrial injury. The mean blood urea level was 55.69 mg/dL and serum creatinine was 1.61 mg/dL, suggesting some degree of renal impairment, which may be due to hepatorenal syndrome or associated acute kidney injury in these patients. Electrolyte analysis showed a mean serum sodium level of 133.68 mmol/L, which is slightly below the normal range, indicating mild hyponatremia.

Esophageal varices were found in 75.5% of patients, with small varices being the most common (29.8%). Grade 2 esophageal varices were observed in 39 patients (25.8%), indicating moderate-sized varices that carry a higher risk of rupture and often warrant endoscopic surveillance or prophylactic band ligation. Grade 1 esophageal varices, representing smaller varices with relatively lower risk, were found in 15 patients (9.9%). Grade 3 esophageal varices, which are large and dilated with high bleeding potential, were seen in 12 patients (7.9%). [Table 6]

Endoscopy was not performed in 25 patients (16.6%), possibly due to contraindications, patient refusal, or recent prior evaluation. A small number of patients, 2 (1.3%), had no varices detected on endoscopy, suggesting either early-stage cirrhosis or non-portal hypertensive causes of their symptoms. Other findings included portal hypertensive gastropathy, erosive gastritis, or generalized mucosal changes, which were seen in 11 patients (7.3%). [Table 7]

Table 1: Distribution on the Basis of Literacy Rate

Education Level	Number of Patients	Percentage
Illiterate	11	7.3
Primary	13	8.6
Middle School	19	12.6
High School	39	25.8
Higher Secondary	20	13.2
Graduate	37	24.5
Postgraduate	12	7.9
Total	**151**	**100**

Table 2: Presenting Complaints in the Study Population

Complication	Present (n)	Absent (n)	Percentage Present (%)
Ascites	147	4	97.4%
Ascites with SBP	49	102	32.5%
Jaundice	29	122	19.2%
Hepatic Encephalopathy	76	75	50.3%
Acute Kidney Injury/HRS	55	96	36.4%
Hepatocellular Carcinoma	3	148	2.0%
Upper GI Bleed	43	108	28.5%

Table 3: Distribution of Viral Hepatitis Markers

Serological Marker	Reactive (n)	Non-Reactive (n)	Percentage Reactive (%)
HBsAg	14	137	9.3%
Anti-HCV	30	121	19.9%

Table 4: Distribution of Other Etiologies of Liver Cirrhosis (n = 151)

Etiology	Frequency	Percentage (%)
Non-Alcoholic Steatohepatitis (NASH)	16	10.6%
Autoimmune Hepatitis	1	0.7%
Wilson's Disease	1	0.7%
Hemochromatosis	0	0.0%
Total	18	11.9%

Table 5: Distribution of In-Hospital Complications Among Liver Cirrhosis Patients

Complication Type	Number of Patients	Percentage (%)
No complications (N)	103	68.2%
Shock (including persistent/recurrent)	18	11.9%
Acute kidney injury (AKI ± HRS)	17	11.3%
Hepatic encephalopathy (HE worsened)	5	3.3%
Upper gastrointestinal bleeding (UGI bleed)	5	3.3%
Metabolic acidosis	1	0.7%
Worsening jaundice	1	0.7%

Table 6: Mean Values of the Laboratory Investigations

Laboratory Parameter	Mean Value
Hemoglobin (g/dL)	9.32
Prothrombin Time (sec)	24.59
INR	2.00
Total Protein (g/dL)	7.21
Albumin (g/dL)	2.70
Total Bilirubin (mg/dL)	5.11
Direct Bilirubin (mg/dL)	3.21
Indirect Bilirubin (mg/dL)	2.10
SGOT (U/L)	148.49
SGPT (U/L)	74.20
Blood Urea (mg/dL)	55.69
Serum Creatinine (mg/dL)	1.61
Serum Sodium (mmol/L)	133.68
Serum Potassium (mmol/L)	10.47

Table 7: Upper Gastrointestinal Endoscopy Findings

Endoscopy Finding	Number of Patients	Percentage (%)
Small esophageal varices	45	29.8%
Grade 2 esophageal varices	39	25.8%
Grade 1 esophageal varices	15	9.9%
Grade 3 esophageal varices	12	7.9%
Endoscopy not done	25	16.6%
No varices	2	1.3%
Others (e.g., PHG, erosions, gastritis)	11	7.3%
Total	**151**	**100%**

CONCLUSION

Liver cirrhosis in this study was most prevalent among middle-aged males, with alcohol emerging as the leading etiology, followed by viral hepatitis and nonalcoholic steatohepatitis. The majority of patients presented with decompensated disease, characterized by ascites, hepatic encephalopathy, and esophageal varices, while complications such as shock and acute kidney injury were also frequent. Outcomes reflected considerable morbidity and mortality, with only three-fourths of patients discharged successfully. These findings underscore the urgent need for early detection and preventive strategies focused on alcohol control and viral hepatitis management, alongside improved community awareness. Strengthening referral systems, expanding access to affordable specialized care, and integrating de-addiction services are vital steps. Targeted public health interventions and healthcare system improvements can significantly reduce disease burden, enhance survival, and improve quality of life for patients with cirrhosis.

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