e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2024; 16(12); 820-826

Original Research Article

A Clinical Study of Liver Cirrhosis Cases and Associated Complications

Meet Kumar[1], Om Prakash Narayan Arya[2]

[1]Associate Professor, Department of General Medicine, Shree Narayan Medical Institute and Hospital, Saharsa, Bihar, India

[2]Assistant Professor, Department of General Medicine, Shree Narayan Medical Institute and Hospital, Saharsa, Bihar, India

Received: 15-10-2024 / Revised: 12-11-2024 / Accepted: 20-12-2024

Corresponding Author: Dr. Om Prakash Narayan Arya

Conflict of interest: Nil

Abstract:

Background: Liver cirrhosis is a serious progressive disease that is morbid and deadly in every part of the world. It is a complication of chronic liver disease caused by alcohol, viral hepatitis and metabolic disease, and it is generally late and has severe consequences.

Aim: The aim of the paper was to determine the demographic, etiological, clinical presentation, complications and severity of liver cirrhosis in patients in a tertiary care unit.

Methodology: It was a prospective observational study which was a one-year study, carried out in a hospital and comprised of 150 patients who had liver cirrhosis. This data was obtained through clinical evaluation, lab tests, and radiographies. Patients underwent etiological assessment, clinical assessment and complications. Statistical analysis was done using SPSS version 24.0 with a significance level of $p < 0.05$.

Results: Most patients fell into the 46-60 years age range (37.3%), and the proportion of male patients was dominating (68.0%). The most frequent etiological factor was alcohol (48.0%), and then viral hepatitis (30.0%). The most frequent clinical features were fatigue (68.0%), and ascites (64.0%). The major complications were ascites (64.0%), hepatic encephalopathy (36.0%) and variceal bleeding (28.0%). There was a significant correlation between etiology and complications ($p = 0.032$) with higher rates of complications in alcoholic cirrhosis. Child-Pugh Class B (44.0%) and Class C (40.0%) were the most common classes of patients.

Conclusion: The liver cirrhosis was mainly seen in males of Middle Ages; alcohol was the main cause. The absence of early diagnosis and prevention combined with high rates of complications and late disease presentation underscores the importance of early diagnosis and management.

Keywords: Liver Cirrhosis, Etiology, Complications, Alcohol, Hepatic Encephalopathy, Child-Pugh Classification.

Introduction

Liver cirrhosis is a long-term, progressive disease in which the liver tissue turns fibrotic and distorted, hepatic architecture is distorted, and regenerative nodules are formed, which ultimately leads to liver dysfunction [1]. Being etiologically diverse and associated with a high number of complications, it is a major burden of world health and is accompanied by high morbidity and mortality [2]. The most common causes of liver cirrhosis are chronic alcohol intake, viral hepatitis (hepatitis B and C) and non-alcoholic fatty liver disease which causes the progressive destruction of liver structure and functioning over time [3].

Liver cirrhosis lacks any symptoms during the first stages, although at later stages, the disease is often associated with complications [4]. The severity of the disease has been determined using standardized classification systems such as the Child-Pugh score which are frequently used to make prognosis and management plans. Although there has been improved diagnostic and treatment methods there are still a significant number of patients who present at the advanced stages especially in developing countries where there is a lack of awareness and delayed diagnosis as well as access to health facilities [5].

With the increasing incidence of liver cirrhosis and its related complications, there is the need to consider a critical clinical research in order to have a clearer explanation of this condition with regard to the demographic profile, etiological distribution and complications. On this basis, the present study was done to evaluate the clinical presentation, etiology, severity and morbidity of liver cirrhosis in the patients of a tertiary care unit so that it would be able to contribute to the improved management and prevention of the disease.

Background of the study: In the world, liver cirrhosis has become an important issue of public health that has led to considerable morbidity, mortality, and healthcare burden, especially in developing countries [6]. It is brought about by the long term liver damage as a result of long term alcoholism, viral hepatitis infection, and metabolic disorders that leads to progressive fibrosis and disrupted normal liver functioning [7]. Cirrhosis burden has also risen in recent years following a change of lifestyle, the increase in the alcohol consumption and the escalating non- alcohol fatty liver disease [8]. Though medical science has become better, early detection remains to be a challenge and many patients have no symptoms until complications develop. This has resulted in a large proportion of the diagnoses being made at their advanced stages that cause a poor prognosis and a high degree of life threatening complications [9]. In this regard, the clinical profile, etiological and complication patterns of liver cirrhosis are important in enhancing early diagnosis, determining effective management, and the development of preventive healthcare measures [10].

Pathophysiology of Liver Cirrhosis: The liver cirrhosis is the outcome of the chronic and repeated liver damage by a variety of factors, such as prolonged alcohol use, viral hepatitis or metabolic imbalances, and causes an inflammatory response and fibrosis [11]. Activation of hepatic stellate cells is initiated by the first injury to hepatocytes and these cells differentiate into fibro genic myofibroblasts and they start to over deposit extracellular matrix material, especially collagen [12]. It is a process that disrupts the normal anatomy of the liver to form fibrous septa and regenerative nodules that modify the vascular structure and block the hepatic blood flow. As fibrosis progresses, intrahepatic resistance increases leading to portal hypertension which is a key contributor to the development of such complications as ascites, variceal bleeding and splenomegaly [13]. Meanwhile, dysfunctional hepatocytes degrade important liver activities such as protein synthesis, detoxification and metabolism, which has clinical consequences such as hypoalbuminemia, coagulopathy, and hepatic encephalopathy due to the accumulation of toxins in the body (e.g. ammonia) [14]. Systemic circulatory changes, including splanchnic vasodilation and neurohormonal activation, including renin-angiotensin-aldosterone system, also appear, which leads to a further rise in fluid retention and renal dysfunction [15]. These pathological processes are interdependent and over time lead to decompensated cirrhosis, multi-organ complications, and increased risk of death.

Research Objectives

The Objectives of the study are:

- To determine the age and gender breakdown of liver cirrhosis patients.
- To catalog and assess the most important risk variables for liver cirrhosis in the sample.
- To examine cirrhotic liver patients' clinical features and complication rates.
- To identify risk factors for serious consequences in patients with liver cirrhosis.
- To determine the degree of liver cirrhosis using the Child-Pugh scale.

Methodology

This study was done to critically assess the clinical presentation, the etiology and complications of liver cirrhosis. An organized and scientifically sound methodology was followed to guarantee reliability, validity and reproducibility of results.

Study Design: The observational prospective design of the study was based on a hospital. This design allowed the researcher to track cases of liver cirrhosis which were diagnosed as such through time and record the incidence of complications and clinical events in a systematic manner.

Study Area: The study was carried out at the Department of General Medicine, Shree Narayan Medical Institute and Hospital, Saharsa, Bihar, India

Study Duration: The study was conducted over the period of one year.

Study Participants

Inclusion Criteria:

- Patients aged 18 years and above.
- Patients diagnosed with liver cirrhosis based on clinical, biochemical, and radiological findings.
- Individuals who agreed to take part in the study after receiving proper medical information.

Exclusion Criteria:

- Acute liver failure patients without cirrhosis.
- Patients having hepatocellular carcinoma during diagnosis.
- Critically comorbid patients that may confound the measurement of outcomes.
- Patients who are not willing and/or capable of giving informed consent.

Sample Size: A total of 150 patients diagnosed with liver cirrhosis were included in the study. The number of cases was selected according to the number of cases available in the period of study and the feasibility, sufficient to do statistical analysis.

Procedure: The subjects were recruited in a sequential order provided that the participants were eligible and fit the inclusion criteria. Clinical History: Detailed clinical history, demographics, alcohol history, viral hepatitis history and other risk factors were taken.

A comprehensive physical examination was done with the respective laboratory tests such as liver functioning tests, complete blood count, coagulogram and viral markers. Imaging, such as ultrasonography and in some cases CT scans were used to verify diagnosis and determine severity of the disease.

It was followed by the incidence of such complications as ascites, hepatic encephalopathy, variceal bleeding, spontaneous bacterial peritonitis and hepatorenal syndrome. A pre-designed data collection proforma was used to record the data in a systematic manner.

Statistical Analysis: SPSS version [24.0] was used for analysis after the data was entered into MS Excel. To describe the data, descriptive statistics were utilized. Statistical tests, such as the Chi-square test and the student t-test, were used to evaluate the relationships between the variables. A p-value below 0.05 was deemed statistically significant.

Results

A total of 150 patients diagnosed with liver cirrhosis were included in the study. Data gathered were tabulated to assess demographics, etiology, clinical presentation and complications of liver cirrhosis.

To comprehend the age and gender structure of liver cirrhosis patients, the demographic composition of the study subjects was examined.

Table 1: Demographic Analysis (n = 150)

	Category	n	%
Age Group (Years)	18–30	18	12.0%
	31–45	42	28.0%
	46–60	56	37.3%
	>60	34	22.7%
Gender	Male	102	68.0%
	Female	48	32.0%

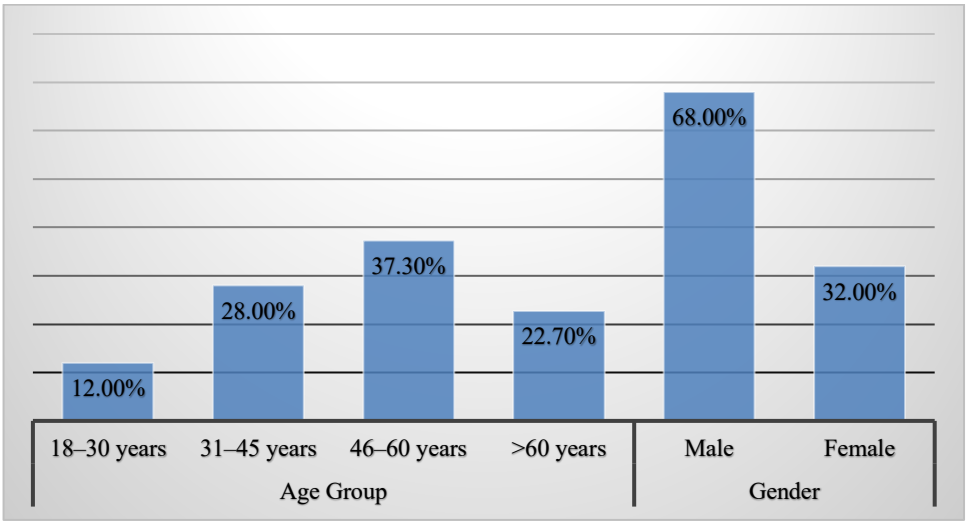

Figure 1: Visual Representation of Demographic Characteristics of Study Participants

Results have shown that most patients were in the 46-60 years age category (37.3%), then 31-45 years (28.0%). There was evident male dominance with 68.0% males as compared to 32.0% females indicating that males were more exposed to risk factors like alcohol consumption. The statistics indicated that liver cirrhosis was more common among middle-aged people.

The etiological factors that have a background of liver cirrhosis within the study population were investigated.

Table 2: Etiological Factors of Liver Cirrhosis

Etiology	n	%
Alcohol-related	72	48.0%
Viral Hepatitis (B & C)	45	30.0%
Non-Alcoholic Fatty Liver Disease (NAFLD)	21	14.0%
Cryptogenic	12	8.0%
Total	150	100.0%

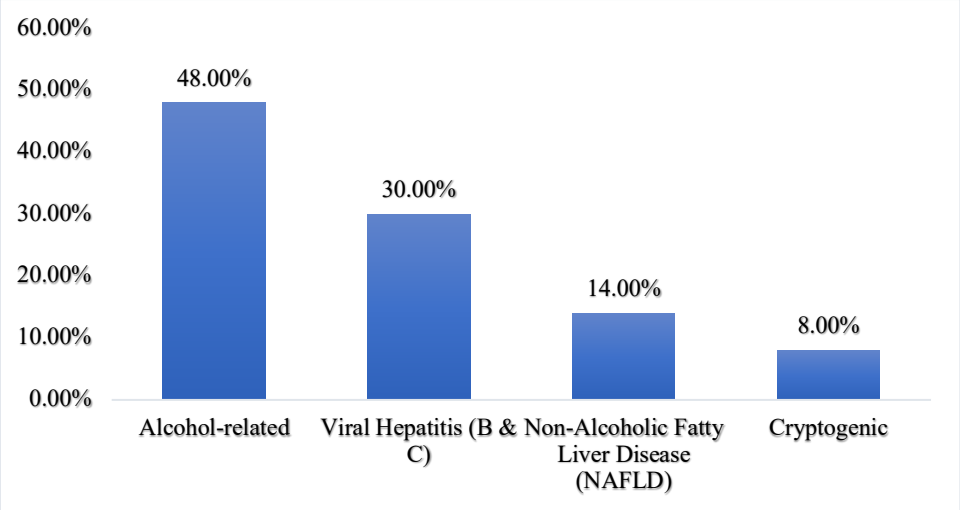

Figure 2: Visual Representation of Etiological Factors of Liver Cirrhosis

Alcohol was found to be the most common cause of liver cirrhosis at 48.0% with viral hepatitis being the second (30.0). Non-alcohol fatty liver disease was significant (14.0), but the cryptogenic causes were relatively low (8.0%). This distribution emphasized the prevalence of avoidable risk factors especially alcohol in the disease occurrence.

The prevalent clinical presentation that is seen by the patients on presentation was evaluated.

Table 3: Clinical Presentation of Patients

Clinical Feature	n	%
Ascites	96	64.0%
Jaundice	88	58.7%
Fatigue	102	68.0%
Peripheral Edema	74	49.3%
Hepatomegaly	69	46.0%
Splenomegaly	58	38.7%
Total	150	100.0%

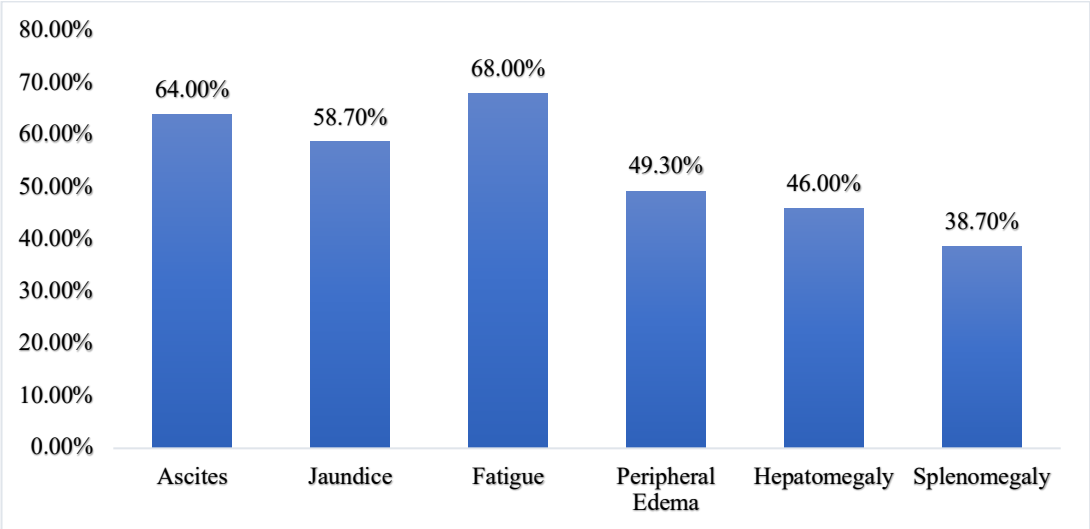

Figure 3: Visual Representation of Clinical Presentation of Patients

Fatigue (68.0) and ascites (64.0) were most common clinical features followed by jaundice (58.7). Forty-nine point three percent of the patients had peripheral edema, which means that the disease is advanced in almost half of the sample. This evidence indicated that the majority of patients came with a symptomatic and clinically significant level of cirrhosis.

The occurrence and prevalence of significant complications in liver cirrhosis were assessed.

Table 4: Complications Observed in Liver Cirrhosis Patients

Complication	n	%
Ascites	96	64.0%
Hepatic Encephalopathy	54	36.0%
Variceal Bleeding	42	28.0%
Spontaneous Bacterial Peritonitis (SBP)	30	20.0%
Hepatorenal Syndrome	18	12.0%
Total	150	100.0%

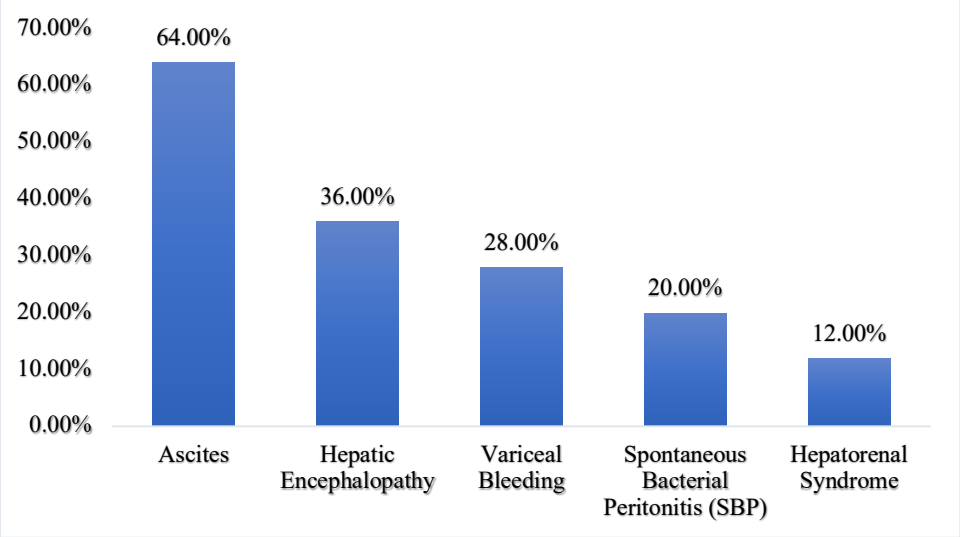

Figure 4: Visual Representation of Complications Observed in Liver Cirrhosis Patients

The most common complication was ascites, which was found in 64.0% of patients, hepatic encephalopathy (36.0) and variceal bleeding (28.0). Bacterial peritonitis was also a serious complication (20.0%) and hepatorenal syndrome (12.0). This was a sign of very heavy load of complications among the patients of cirrhosis.

The association between different etiological factors and the occurrence of major complications was analysed.

Table 5: Association Between Etiology and Major Complications

Etiology	Ascites (%)	Encephalopathy (%)	Variceal Bleeding (%)	p-value
Alcoholic	70.8	41.7	33.3	0.032
Viral	62.2	35.6	24.4	
NAFLD	57.1	28.6	19.0	
Cryptogenic	50.0	25.0	16.7	
Total	150	100.0%	Total	150

Compared to other etiologies, alcoholic cirrhosis patients had higher complication rates namely: ascites (70.8%), and hepatic encephalopathy (41.7%). The statistical significance was found to be significant ($p = 0.032$), thus showing that the severity and progression of the disease was influenced by the etiology.

Now the severity of liver cirrhosis in patients was determined depending on the clinical evaluation through standard parameters.

Table 6: Severity of Cirrhosis Based on Clinical Assessment (Child-Pugh Classification)

Class	Frequency (n)	Percentage (%)
Class A	24	16.0%
Class B	66	44.0%
Class C	60	40.0%
Total	150	100.0%

Most patients fell into Child-Pugh Class B (44.0% and Class C (40.0%), which included moderate to severe liver dysfunction. Class A, which represents early-stage disease, was only 16.0%. This distribution implied that the majority of the patients addressed medical care in the later stages of cirrhosis.

Discussion

The current research paper has shown that middle-aged men were more likely to have liver cirrhosis with 37.3 percent of the patients being in the 46-60 years old brackets and 68 percent of the patients being males. These results were in line with the previous literature which indicated higher prevalence of cirrhosis among males because they are more exposed to alcohol and other risk factors related to lifestyle. As an example, the article by Asrani SK et al. (2019) emphasized the worldwide prevalence of liver disease with a strong, but not exclusive, male gender, and higher rates within the middle-aged groups. On the same note, to highlight alcohol consumption habits as a leading risk factor of cirrhosis, Simpson RF et al. (2019) stressed that this also applied to adult men (Asrani et al., 2019; Simpson et al., 2019) [16, 17]. These similarities suggest that the demographic pattern that is presented in the current study is in line with the global trends in epidemiology.

Etiologically, alcohol was found to be the primary cause, with 48.0% of the cases, and then there was viral hepatitis (30.0%). Such a trend was in line with the results of various previous studies. The largest systematic review of cirrhosis in India identified alcohol as the most frequently occurring etiology (~43.2%), with viral and metabolic etiologies (Moon et al., 2020) [18]. Moreover, earlier epidemiological studies have continuously shown that the leading causes of cirrhosis globally are alcohol and viral hepatitis. Other complications in the present study like ascites (64.0%), hepatic encephalopathy (36.0%), and variceal bleeding (28.0%) were also very common and agree with previous clinical findings that ascites and complications related to portal hypertension were the most frequent manifestations of decompensated cirrhosis (D'Amico et al., 2006;) Schupp The results support the fact that cirrhosis is frequently diagnosed at a severe stage with a high clinical load.

The correlation between etiology and complications in the current study showed that alcoholic cirrhosis was associated with an increased rate of complications, especially ascites (70.8%) and hepatic encephalopathy (41.7%) and a statistically significant correlation was established ($p = 0.032$). This observation corroborates earlier studies that have suggested that alcohol-related liver disease correlates with worse disease course and increased risk of decompensation. Moreover, most of the patients in this study were Child-Pugh Class B (44.0%), Class C (40.0%), which implied late presentation [19,20]. Corresponding trends have been observed in previous research in which a high percentage of patients were diagnosed with advanced liver dysfunction (D'Amico et al., 2006). Altogether, the results of the current research were in line with the already existing literature, which highlights the importance of alcohol, late clinical manifestation, and high morbidity ratio in liver cirrhosis.

Conclusion

The current paper found that middle-aged males were the most affected by liver cirrhosis, with alcohol being the most common etiological agent followed by viral hepatitis. Clinical profile showed that the majority of patients had advanced cases, which was shown by the high prevalence of complications including ascites, hepatic encephalopathy, and bleeding varices. There was much correlation between etiology and incidence of complications and alcoholic cirrhosis was found to be more severe and had more complications. The majority of patients belonged to the Child-Pugh Class B and C, which is moderate and severe liver dysfunction at the diagnosis stage. Overall, the findings have indicated that preventable risk factors, late presentation, and high burden of complications in liver cirrhosis are vital problems that must be early diagnosed, intervened, and prevented.

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