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Original article

Characterization of Liver Cirrhosis in Patients Hospitalized at a University Hospital in Colombia

Derly Milena Peña-Ramírez,[1] César Orlando Lizarazo-Correa,[2] Ledmar Jovanny Vargas-Rodríguez.[3*]

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[1] Physician, Universidad Pedagógica y Tecnológica de Colombia, Internal Medicine Service, Hospital San Rafael. Tunja, Colombia.
[2] Student, ACEMED Research Group, Universidad Pedagógica y Tecnológica de Colombia. Tunja, Colombia.
[3] Physician, specialist in Epidemiology, Hospital San Rafael. Tunja, Colombia.

***Correspondence:** Ledmar Jovanny Vargas-Rodríguez.
lejovaro@gmail.com

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Abstract

Introduction: Cirrhosis is a chronic, diffuse, and irreversible liver disease that represents the final stage of various liver conditions caused by different etiologies. **Objective:** To characterize patients with liver cirrhosis treated at a hospital in Boyacá. **Methodology:** A retrospective, cross-sectional descriptive study was conducted, including patients over the age of 18 who were treated at the Hospital Universitario San Rafael in Tunja with a diagnosis of liver cirrhosis of any etiology between January 01, 2016, and December 31, 2021. **Results:** The age range of the study population was 28 to 89 years, with men accounting for the majority (77.51%). The most frequent complications observed were ascites and hepatic encephalopathy. A total of 12.8% of patients required admission to the intensive care unit (ICU), 38.7% were classified as having decompensated disease (Child-Pugh C), and the overall mortality rate was 34.6%. **Conclusions:** Cirrhosis imposes a significant financial burden on both the healthcare system and patients. The primary cause of cirrhosis in this population was alcohol consumption, a modifiable risk factor. The higher prevalence in men may be attributed to greater exposure to risk factors, such as alcohol consumption, which is common in the country. The mortality rate for this condition remains high, and given the natural course of the disease, it significantly impacts patients' quality of life, leading to an increased number of years lost due to disability and premature death.

Keywords

Cirrhosis, alcoholism, liver, mortality, ascites.

INTRODUCTION

Cirrhosis is a chronic and diffuse liver disease triggered by various etiologies, with the most common being alcohol consumption, hepatitis virus infection, and non-alcoholic steatohepatitis[1,2]. Regardless of its etiology, the mechanisms leading to cirrhosis are shared. They begin with hepatocyte necrosis or lysis, resulting in the loss of hepatic parenchyma and inflammation. Healthy hepatic parenchyma is progressively replaced by fibrotic tissue and regenerative nodules, ultimately leading to liver failure, portal hypertension, and hepatocellular carcinoma[3,4].

Early identification of the clinical features of cirrhosis allows physicians to guide their diagnostic strategy, reverse causal factors, establish timely treatment, and prevent complications[5]. Unfortunately, the diagnosis of cirrhosis is often made late nowadays, which means that management is primarily focused on treating complications of the decompensated disease. As a result, many patients eventually require liver transplantation. This leads to a significant impairment in their quality of life and, evidently, represents a major public health issue[3].

According to 2019 data from the National Administrative Department of Statistics (DANE), Boyacá is one of the

departments with the highest prevalence of alcohol consumption[6]. This factor is the leading cause of cirrhosis worldwide and accounts for a high rate of morbidity and mortality, resulting in a significant impact on the quality of life of individuals affected by the disease, particularly in developing countries such as Colombia[7,8].

In 2018, the World Health Organization (WHO) estimated that alcohol consumption was responsible for three million deaths annually worldwide[5]. Alcohol is the most common cause of liver damage in approximately 60% of reported cases in Europe, North America, and Latin America[9,10], where higher mortality rates due to cirrhosis secondary to alcohol consumption have been reported in countries such as Peru, Nicaragua, and Mexico[8,9]. In Colombia, the situation is similar. Although there is insufficient information regarding the clinical and sociodemographic characteristics of affected patients, some studies focused on the populations of Antioquia and Barranquilla show a high prevalence of the disease[10-12].

Given the high mortality rate, the complexity of the disease, and its poor prognosis, it is crucial to emphasize the need for timely and early diagnosis. This is especially important for populations such as Boyacá, which shows a high prevalence of alcohol consumption and presents sociodemographic characteristics different from those studied in other regions of the country. Therefore, the objective of this study is to describe the sociodemographic and clinical characteristics of patients with liver cirrhosis.

MATERIALS AND METHODS

Type of study

A descriptive, cross-sectional, retrospective study was carried out.

Population and selection criteria

The target population included all patients over 18 years of age who were treated at the Hospital Universitario San Rafael de Tunja for liver cirrhosis of any etiology between January 1, 2016, and December 31, 2021, excluding those with incomplete medical records.

Data collection and analysis

Data collection was carried out by the investigators. Initially, the list of patients was identified using the International Classification of Diseases (ICD-10) code; subsequently, a Google Forms instrument was adopted to collect all the variables from the medical records.

The variables considered included: age at the time of cirrhosis diagnosis, sex of the patient, disease progression time, sociodemographic characteristics (place of origin, education level, social security affiliation, and type of health insurance), etiology of liver cirrhosis (alcoholic, autoimmune, viral, non-alcoholic fatty liver disease, drug-induced, secondary to hemochromatosis, primary biliary, secondary biliary, or unclassified), presence of complications (ascites, hepatic encephalopathy, spontaneous bacterial peritonitis, esophageal varices, gastrointestinal bleeding, hepatorenal syndrome), and the time of evolution between cirrhosis diagnosis and the diagnosis of these complications. Additionally, the presence of comorbidities (arterial hypertension, diabetes mellitus, chronic kidney disease, rheumatoid arthritis, gastric ulcers), number and duration of hospitalizations, the time between each hospitalization in patients with more than one admission, patients requiring management in an intensive care unit (ICU) and number of days spent in the ICU, patient mortality, time from disease diagnosis to death, and age at the time of death were recorded.

The database was registered in Excel version 2013 and analyzed using SPSS statistical package version 22. Univariate analysis was performed through descriptive statistics for each group, determining absolute and relative frequencies for categorical variables; for quantitative variables, measures of central tendency (mean, median) and measures of dispersion (standard deviation and interquartile range) were calculated.

Ethical considerations

Based on Resolution 8430 of 1993, this study is considered a no-risk investigation. Authorization for the review of medical records was obtained from the Ethics and Research Committee of the Hospital Universitario San Rafael de Tunja (Minutes No. 053).

RESULTS

Selection of participants

During the study period, a total of 312 medical records were collected. However, during the review process, 23 records were excluded for the following reasons: 15 corresponded to patients with incomplete medical records with missing information, and 8 had ICD-10 coding that did not match the diagnosis of liver cirrhosis.

Sociodemographic characterization

The minimum age of the evaluated population was 28 years, and the maximum age was 89 years. The majority were male,

accounting for 77.51%. A relevant finding is that the most frequent etiological agent was alcohol consumption. However, the type or degree of alcohol consumption is not known, as it could involve non-distilled alcohol, such as "guarapo" or "chicha," which are frequently consumed in agricultural regions during working hours to quench thirst (**Table 1**).

Table 1. Sociodemographic characterization

Variables		Total (n: 289)	%
Sex	Female	65	22.49
	Male	224	77.51
Type of regime	Contributory	37	12.80
	Subsidized	252	87.20
Etiology	Alcoholic	244	84.43
	Autoimmune	12	4.15
	Primary biliary	10	3.46
	Secondary biliary	1	0.35
	Non-alcoholic fatty liver disease	5	1.73
	Drug-induced	1	0.35
	Idiopathic	10	3.45
	Hemochromatosis	4	1.38
	Viral	2	0.69
Educational Level	None	6	2.08
	Not available	196	67.82
	Primary	65	22.49
	Secondary	13	4.50
	University	9	3.11

Table created by the authors.

Comorbidities and complications

The most frequently occurring complications were ascites and hepatic encephalopathy (**Table 2**).

Prognosis

A total of 12.8% required hospital stay in the ICU, 38.7% were classified as Child-Pugh C disease, and the mortality rate was 34.6% (**Table 3**).

DISCUSSION

Cirrhosis follows an evolving course marked by different clinical stages. For a long time, it has been recognized that the natural history of cirrhosis is dominated by a prognostic milestone represented by the development of complications related to portal hypertension and liver dysfunction, such as gastrointestinal bleeding, hepatic encephalopathy, jaundice, and ascites formation. This led to the division of the disease course into two distinct clinical states: a compensated phase, characterized by preserved quality of life and an average survival exceeding 12 years, and a decompensated phase, marked by the onset of complications, with an average survival reduced to 2-4 years[3,5].

Table 2. Comorbidities and complications

Variables		Total (n: 289)	%
Ascites	No	131	45.33
	Yes	158	54.67
Hepatic encephalopathy	No	158	54.67
	Yes	131	45.33
Spontaneous bacterial peritonitis	No	272	94.12
	Yes	17	5.88
Esophageal varices	No	170	58.82
	Yes	119	41.18
Gastrointestinal bleeding	No	164	56.75
	Yes	125	43.25
Arterial hypertension	No	209	72.32
	Yes	80	27.68
Diabetes	No	256	88.58
	Yes	33	11.42
Rheumatoid arthritis	No	280	96.89
	Yes	9	3.11
Biliary lithiasis	No	245	84.78
	Yes	44	15.22
Gastric ulcers	No	205	70.93
	Yes	84	29.07

Table created by the authors.

In the compensated phase, patients are typically asymptomatic or present with nonspecific symptoms. During this stage, the liver is still able to perform its essential functions, and the patient's quality of life remains relatively stable. In contrast, the decompensated phase is characterized by the onset of evident symptoms such as ascites, hepatic encephalopathy, jaundice, gastrointestinal bleeding, and other severe complications. These events can lead to prolonged hospitalizations, liver transplantation, and even

death[13-16]. Acute decompensation is defined by the rapid development of one or more major complications, such as grade 2 or 3 ascites, acute hepatic encephalopathy, gastrointestinal bleeding, or acute bacterial infections. Additionally, the study defined multi-organ failure as a criterion for diagnosing acute-on-chronic liver failure (ACLF), which can worsen the prognosis and increase mortality[13-16].

Table 3. Variables to establish the prognosis

Variables		Total (n: 289)	%
ICU	No	252	87.20
	Yes	37	12.80
Child-Pugh Scale	Class A	47	16.26
	Class B	91	31.49
	Class C	112	38.75
	Not available	39	13.49
In-Hospital Mortality	Within 48 hours	36	12.46
	After 48 hours	64	22.15
	No	189	65.40

Table created by the authors.

Clinical events occurring during a period following acute decompensation can help classify patients into different groups based on disease progression. This classification identifies clinical trajectories that reflect various levels of instability and mortality risk[13-16].

Cirrhosis is the final result of chronic liver diseases, secondary to excessive alcohol consumption, viral hepatitis, or non-alcoholic fatty liver disease, which is becoming increasingly common due to the rise in obesity, type 2 diabetes mellitus, and sedentary lifestyles[3,4]. In our findings, the male sex represents the vast majority of cases, which contrasts with other studies conducted in Colombia, where a higher prevalence of cirrhosis in females was reported [10,17-19].

The population affiliated with the contributory health regime was a minority. In Colombia, two other studies have reported the type of affiliation to the health system, finding that 77.1% and 60% of the population, respectively, were affiliated with the contributory regime[10,20]. The reason why the majority of the population in our study had subsidized health coverage is partly due to the characteristics of the population covered by the hospital, which is mainly composed of agricultural workers from the central region of the country.

The main etiologies of liver cirrhosis in our population are consistent with findings from other studies, in which alcoholic, autoimmune, and viral causes are among the most frequent[10,17,21]. Globally, one-quarter of cirrhosis-related deaths are attributable to alcohol consumption[22]. Furthermore, in the Americas, there is a noticeable shift from predominantly viral etiologies toward an increase in alcohol-related cirrhosis. This trend is associated with improved control of viral diseases and a rise in alcohol consumption[23].

The variable of educational level emerges as a factor of particular relevance. Although the lack of complete data across the entire population limits its analysis, education remains an important factor. Most cases of cirrhosis occur in individuals with low levels of education, which is also related to the high prevalence of alcoholic liver cirrhosis and affiliation with the subsidized health insurance regime. This suggests an association between low educational level, poverty, and alcohol consumption, as individuals engaged in agricultural work do not typically consider "guarapo" or "chicha" as alcoholic beverages, but rather as drinks to quench thirst during workdays. Prospective studies are needed to evaluate the composition of these substances and, in this way, address a multidimensional problem that requires an interdisciplinary approach, considering both medical and sociocultural aspects. The interrelationship among these factors highlights the need for a comprehensive and collaborative understanding to effectively address this issue and its determinants[23].

Up to 50% of patients with cirrhosis, particularly those with alcoholic etiology, may experience decompensation with the development of ascites[9,24], a figure consistent with our findings. However, it is notably higher compared to other national studies, where prevalence ranges from 13% to 36%[10,18]. This can be mainly explained by the high proportion of patients with alcohol-related cirrhosis in our population.

Spontaneous bacterial peritonitis is a serious complication in cirrhotic patients with ascites, and its prevalence ranges from 10% to 25% among hospitalized patients[24]. However, in our population, it was a rare complication, possibly due to the high prevalence of gastrointestinal bleeding and, consequently, the administration of antibiotics, which could reduce the frequency of this complication.

The prevalence of esophageal varices increases with the progression of liver disease (Child-Pugh class A: 43%, class B: 71%, class C: 76%)[25]. Approximately 50% of patients with newly diagnosed cirrhosis have esophageal varices, and peptic ulcers are present in 35% of cases[26,27]. These figures are lower than those reported in our population. Nonetheless, our figures also remain lower compared to other studies conducted in Colombia: Vélez et al. reported a prevalence of 62.1%[17], and Escorcia & Marrugo reported 62.6%[10].

The prevalence of overt hepatic encephalopathy at the time of cirrhosis diagnosis ranges from 10% to 14%, and from 16% to 21% in decompensated cirrhosis[28,29]. National

studies are also consistent with international literature, reporting prevalences between 5.6%[18] and 22.5%[10]. The higher figures observed compared to other studies may be related to the high prevalence of alcohol-related cirrhosis, which is associated with a greater number of cases of hepatic encephalopathy.

The most common comorbidity was arterial hypertension. Our findings are consistent with the frequency of hypertension in the general Colombian population, considering that the reported national prevalence of arterial hypertension is 28.14%[30,31]. The second most common comorbidity was type 2 diabetes mellitus[32-34]. This latter finding aligns more closely with the general population prevalence and with our reported prevalence of diabetes in cirrhotic patients. However, compared to other studies, the frequency of this condition remains high, possibly due to specific dietary habits of the regional population, which are based on high carbohydrate consumption.

The high percentage of patients with rheumatoid arthritis in our population is noteworthy, considering that, according to the latest audited and analyzed period reported by the Cuenta de Alto Costo de Colombia (Colombian High-Cost Account), corresponding to the period between July 1, 2020, and June 30, 2021, only 0.27% of the Colombian population is affected by this pathology[35]. Among the group of cirrhotic patients with autoimmune etiology, one patient (8.3%) had arthritis as a comorbidity. This suggests that as autoimmunity becomes a more common etiology of cirrhosis in our setting, the occurrence of polyautoimmunity in these patients also increases.

The frequency of the history of biliary lithiasis in our population of cirrhotic patients was higher than what has been reported in the literature. In the general population, the prevalence of this condition is approximately 10%, and in Colombia, it is 8.6%[36]. However, this could be related to the local epidemiology of lithiasis, highlighting the need for further local research on this topic.

CONCLUSIONS

Liver cirrhosis is a pathology that generates high costs for both the healthcare system and the patient. The main cause of cirrhosis is alcohol consumption, a modifiable risk factor. There is a higher prevalence in males, which is attributed to exposure-related factors. The mortality rate of this condition is high, and according to the natural course of the disease, the patient's quality of life is significantly affected, increasing the years of life lost due to disability and death.

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Authors' own resources.

Conflicts of interest

The authors state that they have no conflicts of interest.

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