From the Heart of Bangladesh: Groundbreaking Study Reveals Key Factors Behind Liver Cirrhosis

Abstract:

Background:

Liver cirrhosis is a common name for a threat to public health. When healthy tissue of the liver is replaced by scar tissue, cirrhosis occurs. A bundle of exaggerated factors is responsible for this life-threatening condition.

Objective:

The present study aimed to evaluate the socio-demographic characteristics and etiological factors of liver cirrhosis in a Bangladeshi population.

Methods:

This cross-sectional analytical study was conducted in the hepatology department of Bangabandhu Sheikh Mujib Medical University. A purposeful sampling technique was used to collect the samples. The study was conducted from October 2020 to September 2021. Patients came to the outdoor hepatology department of BSMMU with the confirmed diagnosis of cirrhosis of the liver. Eight hundred ninety-six patients were included in the study. Data were collected in a predesigned data collection sheet through face-to-face interviews and medical record reviews.

Result:

In the present study, 69.6% of respondents were female. The majority of the participants (53.2%) were in the 30- 50 age group. Nearly 60% of LC patients tested positive for the Hepatitis B virus. On the other hand, only 16.3% of patients tested positive for the hepatitis C virus. In general, HBV exaggerates the chance of having cirrhosis in Bangladesh.

Conclusion:

This clinical study illustrated the etiology of liver cirrhosis in our country compared to other countries. This dissimilarity regarding etiology with other countries enhances the importance of more clinical studies in different parts of the world.

Keywords: Chronic liver disease, hepatitis B, hepatocellular carcinoma, hepatology, socio-demographic.

Introduction:

Chronic liver disease (CLD)- is one of the significant life-threatening reasons that increases its intensity year by year. “In terms of the most advanced stages of CLD, there may be a common concern, that is, cirrhosis of the liver, recognized as a global burden” [1].

According to epidemiological studies in the year 2017, around 5.2 million people in the world are affected by cirrhosis of the liver. “It found that, according to the data from 2019, around 1.48 million patients died from cirrhosis of the liver. Mostly, middle-aged people are affected, and this resembles a worst-case scenario in terms of the prognosis of the disease” [2].

Chronic liver disease is an end-stage disease associated with esophageal varices and malignancies such as hepatocellular carcinoma (HCC). Gastrointestinal (GI) symptoms, such as nausea, vomiting, abdominal pain, and diarrhea, are commonest in these advanced liver disease patients; however, the importance of portal hypertension for these symptoms is unknown.

The causes of cirrhosis depend on the geographical location. “For example, Hepatitis B is the most common cause of liver cirrhosis, followed by hepatocellular carcinoma” [3].

Generally, in the estimation of the diagnosis of cirrhosis of the liver, the signs and symptoms of the patients correspond strongly. “Once upon a time, liver biopsy was a known ‘’gold standard’’ method however nowadays, the degree of fibrosis can be estimated by measurement of biomarkers, such serum markers such as aspartate aminotransferase to platelet ratio index (APRI), FIB-4 index, aspartate aminotransferase (AST) to alanine aminotransferase (ALT) ratio, or modalities such as acoustic radiation force impulse (ARFI), transient elastography (TE), and magnetic resonance elastography” [4].

There is a close relationship between liver cirrhosis and protein-energy malnutrition (PEM). However, due to the increasing sedentary lifestyle, the prevalence of obesity is high in an alarming range. As a result, the number of obese LC patients has increased, and restriction of excessive caloric intake without the worsening of impaired nutrient metabolism is required for such patients. “Hence, if we discuss the prevention or management of cirrhosis of the liver, changes in dietary habituation followed by lifestyle modification should be considered an effective method to control the prognosis of the disease” [5].

As the etiology is changing and increasing the prevalence of chronic viral hepatitis, cirrhosis of the liver is becoming a worldwide problem in public health. To decline the prognosis, medical management can alter the progression of compensated cirrhosis to decompensated cirrhosis is currently being developed. However, being an expensive and challenging procedure, liver transplantation is the only option in a selected subgroup of patients with end-stage disease.

Methodology

This cross-sectional analytical study was conducted in the hepatology department of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. The study was conducted from October 2020 to September 2021. Patients came to the outdoor hepatology department of BSMMU with the confirmed diagnosis of cirrhosis of the liver. The diagnosis was confirmed by complete blood count (CBC), liver enzyme, liver function, electrolyte testing, and screening for other health conditions. Some of the patients underwent liver biopsy. A purposive sampling technique was applied to collect the samples. 896 patients were included in the study. The patient was interviewed for their socio-economic information. Data were collected in a predesigned data collection sheet through a face-to-face interview and medical record review.

All the patients were adults (age >18 years). Patients suffering from malignancy or mentally unstable patients were excluded from this clinical study.

The statistical analysis was conducted using SPSS (Statistical Package for social science) version 26 statistical software. The study's findings had been presented by frequency, percentage in tables. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample.

Result & Discussion:

Distribution of study population according to socio-demographic variables (n=896)

Figure 1 shows the distribution of the study population according to gender. It is evident that 69.6% of respondents were female.

Table 1 shows the distribution of participants according to age group. The majority of the participants (53.2%) were in the 30- 50 age group.

Most cirrhosis patients (54.6%) were in 30-50 years of age group (Table 2).

Table 3 illustrates the distribution of liver cirrhosis patients according to etiological causes. It is evident that about 60% of LC patients were Hepatitis B virus (HBV) positive. On the other hand, only 16.3% of patients were hepatitis C virus (HCV) positive. In general, HBV exaggerates the chance of having cirrhosis in Bangladesh.

Here, we can also see the frequency of liver cirrhosis in patients of different ages (Table 4).

Liver cirrhosis is one of the fast-growing epidemiological global problems among other life-threatening diseases. The etiology of liver cirrhosis is rapidly changing over the world.

This cross-sectional analytical study was conducted in the hepatology department of Bangabandhu Sheikh Mujib Medical University. The study was conducted from October 2020 to September 2021. Patients came to the outdoor hepatology department of BSMMU with the confirmed diagnosis of cirrhosis of the liver.

The majority of the global deaths (62.6%) due to liver diseases occurred in the Asia Pacific region from the year 2015, whereas the most typical cause of these deaths was Hepatocellular carcinoma (HCC) (72.7%). More than half of the deaths due to cirrhosis in this region occurred due to the HBV virus. “Alcohol consumption (20·8%), non-alcoholic fatty liver disease (NAFLD; 12·1%), and chronic infection with hepatitis C virus (HCV; 15·7%) were other etiological factors” [6]. So, observing the changes in etiological factors in this region is a vital discussion in our public health sector. “In the case of mortality, another Asia-Pacific region study compared two groups, and the ultimate outcome was that the cirrhotic group had significantly higher mortality and complications than the non-cirrhotic group” [7].

In our study, the majority (69.6%) of the study population were female. However, a study occurred in Japan, and the majority (61.6%) of participants were male [8].

“In the case of the age group, 53.2% of participants were under 30-50 years of age. Among them, 54.6% of liver cirrhosis patients were in the 30-50 years of age group. There was a study in North East India where the majority of adult liver cirrhosis patients were in the 35-54 years of age group” [9].

Moreover, nearly 60% of patients were hepatitis B virus (HBV) positive, which was the leading cause of the development of cirrhosis of the liver. “In the same study that occurred in South East

Asia, the majority of the patients (39.5%) were affected by liver cirrhosis due to chronic hepatitis B virus (HBV)" [10]. "Another study in South East Asia revealed that the commonest cause of CLD was undiagnosable (31%), whereas autoimmune (26%), hepatitis C virus (21%), hepatitis B virus (14%), and schistosomiasis (8%) were also found. Among the participants, most of the patients (98%) had evidence of decompensated liver disease" [11].

Having gross changes in the etiology of liver cirrhosis, there is necessary to discuss etiological differences of liver cirrhosis in the nearest countries around Bangladesh. In Nepal, Alcohol is considered one of the leading causes of cirrhosis [12]. Similarly, if we study the common etiologies of India, the most common etiology is alcohol-related liver disease, followed by NASH [13]. However, according to Pakistani studies, the commonest etiology of cirrhosis of the liver is viral hepatitis B and C [14].

In Bangladeshi ground, hepatitis B and C virus are the most common reasons of Chronic liver disease. There was a clinical study held at Chittagong Medical College; according to the study findings, hepatitis B (50%) and hepatitis C (26.67%) were the most common causes of chronic liver disease [15]. Similarly, another study held in the department of Mymensingh Medical College found a similar prevalence of HBV and HCV infections in Bangladesh followed by other Asian countries [16]. However, a study was held at Ibn Sina Diagnostics and Imaging Center, Dhanmondi, Dhaka, Bangladesh. In that study, we found a high rate of prevalence of HCV among the population (166 of 200 male samples and 131/190 female samples were found positive for HCV). However, a study was conducted at BSMMU in 2016. "According to female records, there was substantial evidence of etiological changes, whereas 52.55 % (494/940) patients had cirrhosis of the liver due to NASH, while 40.21 % (378/940) were affected due to HBV" [17]. "Another study found in the South revealed the cause of changing etiology in our country; the study revealed that obesity, dyslipidemia, insulin resistance (IR), and type-2 diabetes mellitus (DM), are the main reasons of NASH, followed by Nonalcoholic fatty liver disease" [18].

Conclusion:

Globally, liver cirrhosis is an important epidemiological concern due to its silent progression. In the end, it is evident that the etiology of liver cirrhosis is evolving rapidly compared to our country. Overall, it varies from country to country. Hence, more studies should be expected to evaluate the changing etiologies nationally and internationally in the future.

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Consent

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

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Figure 1: Distribution of study population according to gender (n=896)

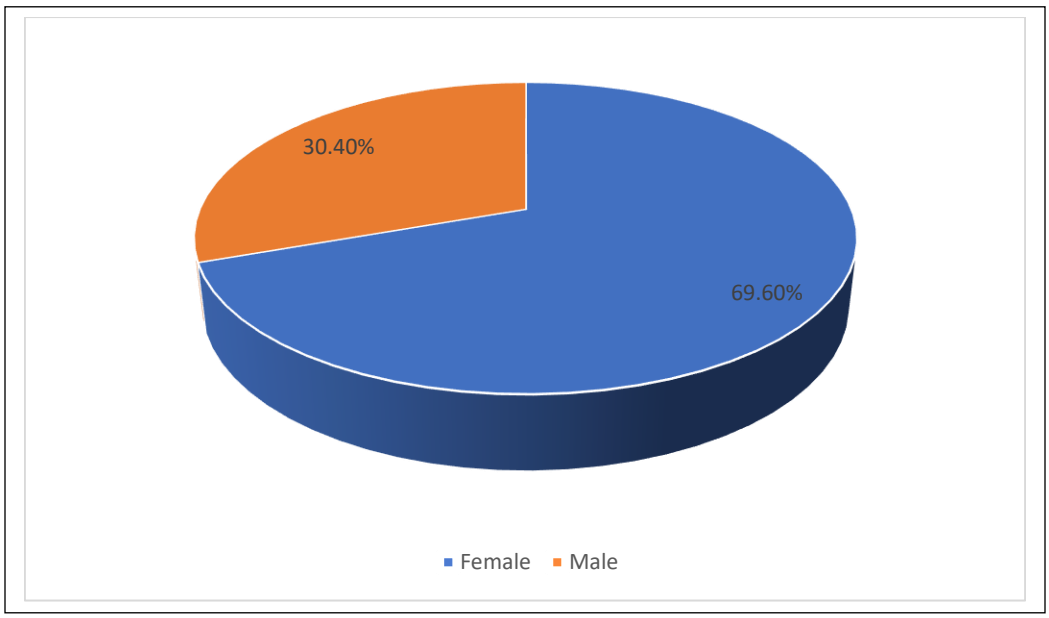

Table 1: Distribution of participants according to age group:

Age classification (years)	Frequency (N)	Percentage (%)
<30	79	8.8
30-50	477	53.2
>50	340	37.9

Table 2: Distribution of liver cirrhosis patients according to age group:

Age classification (years)	Frequency (N)	Percentage (%)
<30	74	9.7
30-50	414	54.6
>50	274	35.7

Table 3: Distribution of liver cirrhosis patients according to etiological causes (n= 896)

Cause	Frequency(N)	Percentage (%)
HBV	545	60.8
Cryptogenic	184	20.5
HCV	146	16.3
Others	21	2.3

Table 4: Gender distribution of liver cirrhosis patients according to age group

Age classification (years)	Male (Frequency)	Female (Frequency)
<30	74	9.7
30-50	414	54.6
>50	274	35.7

Table 5 :Incidence of Etiological changes of Cirrhosis of liver globally from 2010-2019

Cause	Incidence (%)
NAFLD	+26.7%
HBV	-0.34%
HCV	+28.6%

***Source:** Xiao et al., 2019

Table 6: Etiological changes of Cirrhosis of liver Globally from 1990-2019

1990	
HBV	28.2%

HCV	23.2%
2019	
HBV	25.4%
HCV	26.9%
Alcohol use	21.3%

***Source:** Wang et al., 2024

Table 4: Etiological changes of Cirrhosis of liver in Bangladesh over decades

Year	**Cause**
1981	Cryptogenic (43.7%)
2014	HBV (49.22%)
2015	HBV (48.1%)
2016	HBV (49.22%)
2019	HBV (70.7%)

*Source: Islam et al., 1981; Mahtab, 2015; Sarin et al., 2020; Das et al., 2016