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Original Article

Clinical, Biochemical and Endoscopic Evaluation of CLD Patients in a Tertiary Care Hospital of Bangladesh: A Cross-Sectional Study

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ABSTRACT

Introduction: Chronic liver disease (CLD) is one of the common cause of sickness and death. This disease usually comes with a variety of different clinical, biochemical, and endoscopic signs, especially in case of developing countries like Bangladesh. A thorough assessment of all the variables is necessary for determining the extent of the disease and mode of treatment. **Methods & Materials:** This hospital-based cross-sectional observational study was conducted among indoor patients admitted to the Departments of Medicine and Hepatology, Mymensingh Medical College Hospital, Mymensingh, Bangladesh, from April 2019 to March 2020. Data were analyzed using SPSS version 22.0. **Results:** Clinically, all patients presented with abdominal distension, with high frequencies of jaundice (82.0%) and abdominal pain (76.0%), indicating advanced disease; ascites (90.0%) and icterus (86.0%) were the most common examination findings. Hepatitis B virus was the leading etiology, 37 (74.0%). Biochemically, most patients had a serum–ascites albumin gradient (SAAG) of 1.50–1.99 g/dL (58.0%), suggesting portal hypertension. Endoscopic evaluation revealed that Grade II esophageal varices were most common (34.0%), followed by Grade III (28.0%) and Grade IV (20.0%). A progressive shift toward higher variceal grades was observed with increasing serum-ascites albumin gradient (SAAG), with the ≥2.0 g/dL group showing predominance of Grade IV varices, 9 (90.0%). **Conclusion:** Chronic liver disease (CLD) patients in this study predominantly presented at advanced stage, with middle-aged males and lower socioeconomic groups being mostly affected. Most had clinical and biochemical evidence of decompensation and portal hypertension, along with a high prevalence of moderate to severe esophageal varices.

Keywords: *Chronic Liver Disease, Endoscopy, Ascites, Serum–Ascites Albumin Gradient*

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INTRODUCTION

Chronic liver disease (CLD) is a serious global health issue that causes a large number of illnesses and deaths around the world. CLD is one of the major causes of death and results in more than one million fatalities every year. It also leads to other health problems like portal hypertension, variceal bleeding, hepatic encephalopathy and hepatocellular carcinoma [1]. CLD features continuous damage and replacement of hepatic cells, which eventually results in scarring and hardening (fibrosis and cirrhosis), thus disrupting the hepatic normal functions [2]. The incidence of CLD is quite alarming in the developing countries, including Bangladesh, where the infectious causes are still the main players. Hepatitis B virus (HBV) infection is the main culprit in chronic liver disease and liver cancer in Bangladesh. Hepatitis C virus (HCV), non-alcoholic fatty liver disease (NAFLD), and alcohol-related liver disease also play significant roles [3]. Regional research has pointed out an increasing trend of CLD prevalence in various divisions of Bangladesh, which indicates that the issue of public health is worsening [4]. This escalating load of diseases highlights the role of further investigation and the need for effective detection measures at the tertiary care level. Usually, the clinical evaluation of liver disease patients reveals a diverse range of conditions. Liver disease can sometimes show no signs at all, but in more extreme cases, liver failure can display symptoms such as collection of fluid in the abdomen (ascites), yellow discoloration of the skin and eyes (jaundice), bleeding from varices, among other things. Acute-on-chronic liver failure (ACLF) is a critical condition that results from chronic liver disease and is linked with a very high risk of death in a short period of time; thus, it needs to be recognized and treated without any delay[5]. For this reason, a thorough clinical examination is paramount in determining the seriousness of the disease and helping with the decision on the type of treatment. Biochemical tests are a vital part of the CLD check-up as they help in checking the hepatic function, inflammation, and progression of the disease. Tests that check for liver function include serum bilirubin, transaminases, albumin, and prothrombin time, and they are extensively utilized to measure the level of liver dysfunction and to categorize the severity of the disease by means of scoring systems such as Child-Pugh and MELD scores [6]. Moreover, there has been a rising use of new biomarkers and non-invasive methods in monitoring fibrosis and forecasting outcomes in patients with chronic liver disease [7]. Evaluation by an endoscope is another vital element in the assessment of chronic liver disease, and especially in the identification of the complications due to portal hypertension, such as esophageal and gastric varices. With the help of upper gastrointestinal endoscopy, not only can varices be diagnosed at the early stage, but there is also an opportunity for carrying out the treatment measures, thus lessening the risk of fatal variceal bleeding [8]. Studies that have taken place in the tertiary care hospitals of Bangladesh have drawn attention to the variety of endoscopic discoveries in patients with chronic liver disease, stressing its diagnostic and prognostic roles[8]. Chronic liver disease, being a highly complex condition, requires a thorough method that would blend clinical, biochemical, and endoscopic variables for the precise and efficient diagnosis, staging, and management to be done [9]. Though the issue of chronic liver disease has been on the rise in Bangladesh, hardly any data exists that combine these factors in a single study setting. This study, therefore, intends to assess the clinical

manifestations, biochemical characteristics, and endoscopic features of chronic liver disease patients in a tertiary care hospital of Bangladesh.

METHODS & MATERIALS

This hospital-based cross-sectional observational study was carried out on indoor patients of the Departments of Medicine and Hepatology at Mymensingh Medical College Hospital, Mymensingh, Bangladesh from April 2019 to March 2020. Adult patients with chronic liver disease admitted during the study period were screened, and those who met the eligibility criteria were enrolled using a non-probability, consecutive approach based on feasibility; in total, 50 patients were enrolled. Inclusion criteria were adult patients with liver cirrhosis aged 18-74 years, of both sex, and who gave consent to participate. Exclusion criteria were age <18 years or >74 years, haemodynamically unstable, having active gastrointestinal bleeding at the time of enrollment, and/or had prior endoscopic therapy (sclerotherapy or band ligation), receiving prophylactic treatment for portal hypertension or interferon therapy, portal vein thrombosis or hepatoma on abdominal ultrasound, hypoalbuminaemia due to nephrotic syndrome, malnutrition or malabsorption, and refusal to participate. Data were filled in a predesigned proforma, then entered into Microsoft Excel, and finally analyzed using SPSS version 22.0. Descriptive statistics of continuous variables have been represented through their mean and standard deviation, whereas categorical features have been depicted through their frequencies combined with percentages. Significant level was fixed at p-value<0.05. In detail, the aim, working methods, and potential benefits or drawbacks were explained to the participants and the guardians in a language they were able to understand; informed written consent was obtained, and the participants were free to withdraw their participation whenever they desired.

RESULTS

Table I shows among the 50 participants, the largest age group was 31–45 years, 22 (44.0%), followed by 46–60 years, 15 (30.0%), 18–30 years, 8 (16.0%), and >60 years, 5 (10.0%). Males comprised 34 (68.0%) and females 16 (32.0%). Most participants were from urban areas, 32 (64.0%), while 18 (36.0%) were rural residents. Regarding occupation, housewives were the most frequent, 13 (26.0%), followed by workers, 12 (24.0%), farmers, 10 (20.0%), business, 9 (18.0%), and service holders, 6 (12.0%). Nearly half belonged to the poor socioeconomic class, 24 (48.0%), while 17 (34.0%) were middle class and 9 (18.0%) were upper class.

Table I
Sociodemographic Characteristics of the Study Population (*n* = 50).

Characteristic	n	%
Age group (years)		
18–30	8	16.0
31–45	22	44.0
46–60	15	30.0
>60	5	10.0
Sex		
Male	34	68.0
Female	16	32.0
Residence		
Rural	18	36.0
Urban	32	64.0
Occupation		
Service holder	6	12.0
Business	9	18.0
Worker	12	24.0
Housewife	13	26.0
Farmer	10	20.0
Socioeconomic class		
Poor	24	48.0
Middle class	17	34.0
Upper class	9	18.0

Table II shows abdominal distension was reported by all participants, 50 (100.0%), while jaundice was present in 41 (82.0%) and vague abdominal pain in 38 (76.0%). Vomiting occurred in 22 (44.0%), altered consciousness in 15 (30.0%), haematemesis in 9 (18.0%), respiratory distress in 8 (16.0%), melaena in 6 (12.0%), and scanty micturition in 4 (8.0%). On examination, ascites was documented in 45 (90.0%) and icterus in 43 (86.0%), with additional stigmata including loss of body hair in 30 (60.0%), spider naevi in 24 (48.0%), palmar erythema in 7 (14.0%), and clubbing in 5 (10.0%).

Table II
Clinical Presentation of CLD Patients among Study Population (*n* = 50).

Clinical feature	n	%
Symptoms		
Abdominal distension	50	100.0
Jaundice	41	82.0
Vague abdominal pain	38	76.0
Vomiting	22	44.0
Altered consciousness	15	30.0

Haematemesis	9	18.0
Respiratory distress	8	16.0
Melaena	6	12.0
Scanty micturition	4	8.0
Clinical signs		
Ascites	45	90.0
Icterus	43	86.0
Loss of body hair	30	60.0
Spider naevi	24	48.0
Palmar erythema	7	14.0
Clubbing	5	10.0

Table III shows Hepatitis B virus was the predominant etiology of CLD, affecting 37 (74.0%) participants, followed by hepatitis C virus in 10 (20.0%). Alcohol-related CLD was uncommon, identified in 1 (2.0%) participant, and other causes accounted for 2 (4.0%) participants.

Table III
Etiology of CLD in the Study Population (*n* = 50).

Etiology	n	%
Hepatitis B virus	37	74.0
Hepatitis C virus	10	20.0
Alcohol-related	1	2.0
Others	2	4.0

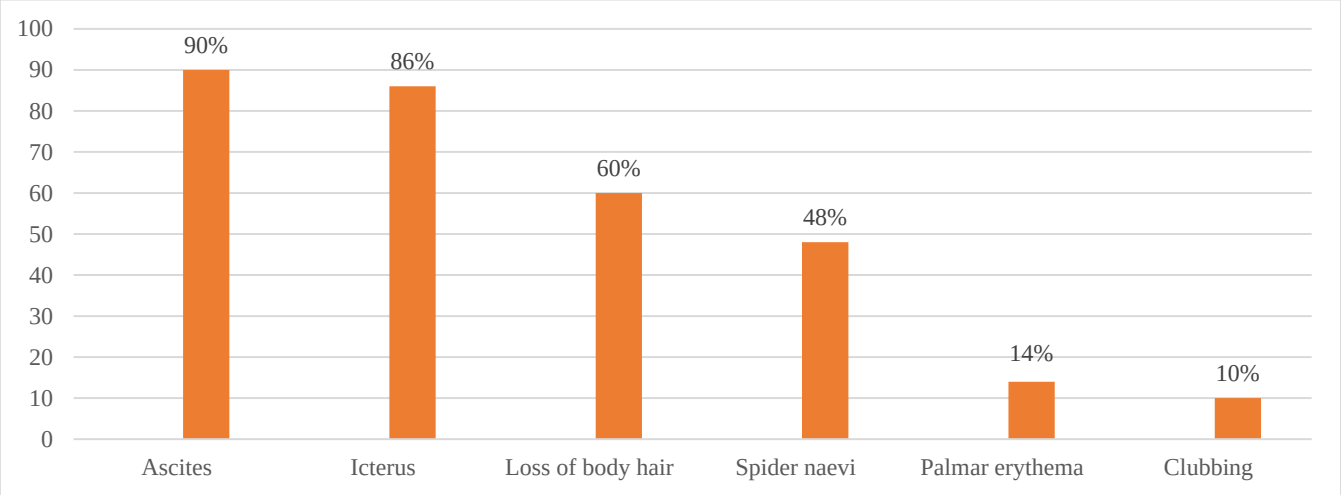

Figure 1 Distribution of Patients according to Clinical Signs (*n*=50).

Figure 1 shows among all the clinical signs, ascites (90%) was most common sign, followed by icterus (86%) and loss of body hair (60%).

Table IV shows, serum–ascites albumin gradient (SAAG) categories, most participants fell within 1.50–1.99 g/dL, 29 (58.0%), while 13 (26.0%) had values ≥2.0 g/dL and 8 (16.0%) had values 1.1–1.49 g/dL. Endoscopically, Grade II esophageal varices were most frequent, 17 (34.0%), followed by Grade III, 14 (28.0%), Grade IV, 10 (20.0%), and Grade I, 9 (18.0%) consecutively.

Table IV
Distribution of Serum–Ascites Albumin Gradient (SAAG) Categories and Esophageal Variceal Grades (*n* =50).

Variable	Category	n	%
Serum–ascites albumin gradient (g/dL)	1.1–1.49	8	16.0
	1.50–1.99	29	58.0
	≥2.0	13	26.0
Esophageal varices (endoscopic grade)	Grade I	9	18.0
	Grade II	17	34.0
	Grade III	14	28.0
	Grade IV	10	20.0

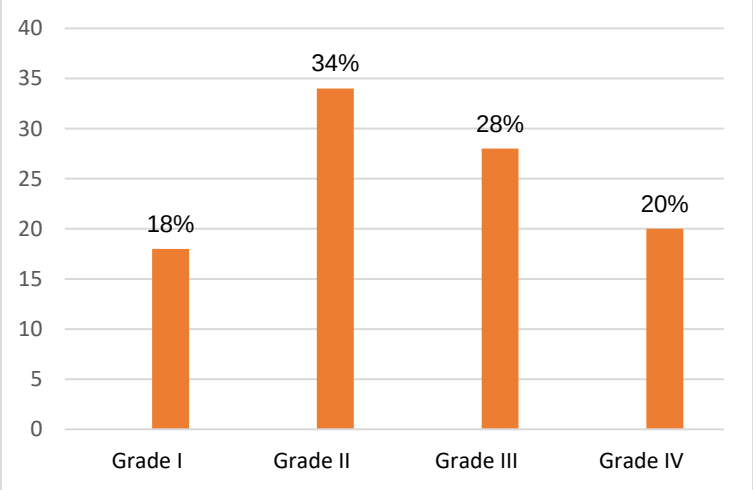

Figure 2 Distribution of Patients according to Endoscopic Grade of Esophageal Varices (*n*=50).

Figure 2 shows most of the CLD patients were in Grade-II (34%), followed by Grade-III (28%), Grade-IV (20%) & Grade-I (18%) esophageal varices consecutively.

Table V shows a stepwise shift toward higher variceal grades with increasing gradient: Grade I predominated at 1.1–1.49 g/dL (7/8, 87.5%), mixed Grade II–III predominated at 1.50–1.99 g/dL (16/29, 55.2%; 10/29, 34.5%), and Grade IV predominated at ≥2.0 g/dL (9/13, 69.2%).

Table V
Association between Serum–Ascites Albumin Gradient (SAAG) Category and Esophageal Variceal Grade (*n*=50).

Serum–ascites albumin gradient (g/dL)	Grade I (n = 9)	Grade II (n = 17)	Grade III (n = 14)	Grade IV (n = 10)	Total (N = 50)
1.1–1.49 (n = 8)	7 (87.5)	1 (12.5)	0 (0.0)	0 (0.0)	8 (100.0)
1.50–1.99 (n = 29)	2 (6.9)	16 (55.2)	10 (34.5)	1 (3.4)	29 (100.0)
≥2.0 (n = 13)	0 (0.0)	0 (0.0)	4 (30.8)	9 (69.2)	13 (100.0)
Total	9 (18.0)	17 (34.0)	14 (28.0)	10 (20.0)	50 (100.0)

DISCUSSION

Most of the participants in this study were between 31 and 45 years of age (44.0%), then came 46-60 years (30.0%), suggesting that CLD is affecting mainly an economically active age group. There was an outstanding male predominance (68.0%) in the study. Asrani et al. found in a worldwide analysis that typically CLD affects middle-aged people and more males than females are affected, approximately 60-70% of cases are males, which aligns with the present results [1]. This is also supported by the study of Mahtab et al. in Bangladesh where 65-75% of CLD patients were males, and most of them were in the 40-60 years age group, which is slightly older than the age peak observed in this study [3]. This study revealed that 64.0% of patients were from urban areas, while Rahman et al. indicated a larger proportion of rural patients (about 58%), implying differences in healthcare accessibility and referral bias may play a role[4]. Furthermore, this study found 48.0% of the participants to be from the poor class, which is in agreement with Mokdad et al., who showed that the CLD burden is mainly concentrated in lower socioeconomic groups, with >50% in low-income settings [9]. Clinically, abdominal distension was the symptom in 100.0% of patients, followed by jaundice 82.0%, and abdominal pain 76.0%, Schuppan and Afdhal reported that ascites occurs in approximately 60% of cirrhotic patients within 10 years of diagnosis, while jaundice is seen in around 60–70% of decompensated cases, which is somewhat lower than the higher proportions observed in this study [2]. Vomiting was present in 44.0% of cases, and altered consciousness in 30.0%, suggesting a considerable proportion with hepatic encephalopathy. Garcia-Tsao et al. reported that hepatic encephalopathy occurs in nearly 30–40% of cirrhotic patients during the disease course, which closely corresponds with the present findings [10]. Gastrointestinal bleeding manifestations such as haematemesis (18.0%) and melaena (12.0%) were also observed; however, Garcia-Tsao et al. documented higher rates of variceal bleeding, approximately 25–35% in cirrhotic patients, indicating relatively lower but still significant occurrence in this study [10]. On physical examination, ascites (90.0%) and icterus (86.0%) were the predominant findings. D'Amico et al. reported ascites in nearly 50–60% of cirrhotic patients and identified it as the most common complication, though the higher proportion in the present study suggests later-stage presentation [11]. Biochemically, the majority of patients had a serum–ascites albumin gradient (SAAG) between 1.50–1.99 g/dL (58.0%), followed by ≥2.0 g/dL (26.0%) and 1.1–1.49 g/dL (16.0%). This indicates that all patients had SAAG ≥1.1 g/dL, strongly suggesting portal hypertension as the underlying cause of ascites. Runyon reported that SAAG ≥1.1 g/dL has an accuracy of about 97% in diagnosing portal hypertensive ascites, which supports the findings of this study [12]. However, other studies have shown a higher proportion (around 40–50%) of patients with SAAG ≥2.0 g/dL, whereas in this study it was 26.0%. Endoscopic evaluation revealed that Grade II esophageal varices were most common (34.0%), followed by Grade III (28.0%), Grade IV (20.0%), and Grade I (18.0%). The North Italian Endoscopic Club reported that approximately 30% of cirrhotic patients have varices at diagnosis, with about 25–30% having medium to large (Grade II–III) varices, which is comparable to the predominance of Grade II and III varices (62.0%) in this study [13]. Furthermore, de Franchis reported that high-grade varices (Grade III–IV) are present in nearly 30–40% of patients with advanced cirrhosis, whereas the present study showed a higher proportion (48.0%), again indicating late presentation and advanced disease in this population[14].

LIMITATIONS

This study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study shows that chronic liver disease patients in a tertiary care hospital setting in Bangladesh commonly present at an advanced stage, predominantly affecting middle-aged males and individual from lower socioeconomic background. Most patients exhibited features of decompensation, including ascites and jaundice, along with biochemical evidence of portal hypertension. Endoscopic findings revealed a high prevalence of moderate to severe esophageal varices, indicating significant disease progression. High serum-ascites albumin gradient (SAAG) values are associated with more advanced esophageal variceal grades.

RECOMMENDATION

Early screening and regular monitoring of high-risk individual should be strengthened to enable timely diagnosis of chronic liver disease. Public awareness programs, especially at lower socioeconomic groups, are essential to promote early healthcare-seeking behavior. Improved access to diagnostic facilities, including biochemical tests and endoscopy, should be ensured at peripheral centers.

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CONFLICT OF INTEREST

None declared.

REFERENCES

1. Asrani SK, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. Journal of Hepatology. 2019 Jan 1;70(1):151-71.
2. Schuppan D, Afdhal NH. Liver cirrhosis. The Lancet. 2008 Mar 8;371(9615):838-51.
3. Mahtab MA. Epidemiology of viral hepatitis and liver diseases in Bangladesh. Euroasian Journal of Hepato-gastroenterology. 2015 Jan 6;5(1):26.
4. Rahman S, Ahmed MF, Alam MJ, Hoque MI, Hussain MM, Kabir AS, Karim MF, Khondokar FA, Mamun-Al-Mahtab AK, Masud MG, Uddin Mollick MK. Distribution of liver disease in Bangladesh: a cross-country study. Euroasian journal of hepato-gastroenterology. 2014 Jan 22;4(1):25.
5. Hernaez R, Solà E, Moreau R, Ginès P. Acute-on-chronic liver failure: an update. Gut. 2017 Mar 1;66(3):541-53.
6. Cornberg M, Tacke F, Karlsen TH. Clinical Practice Guidelines of the European Association for the Study of the Liver–Advancing methodology but preserving practicability. Journal of Hepatology. 2019 Jan 1;70(1):5-7.
7. Ndabakuranye JP, Li S, Burchall G, Fox K, Piva T, Xu Z, Kavehei O, Prawer S, Ahnood A. 70 years of bilirubin sensing: towards the point-of-care bilirubin monitoring in cirrhosis and hyperbilirubinemia. Sensors & Diagnostics. 2022;1(5):932-54.
8. Siddiqua A, Rishad MM, Noor N, Reza IB, Das A, Ahasan HN. Endoscopic Features of Chronic Liver Disease Patients Admitted in a Tertiary Care Hospital in Bangladesh: A Cross-Sectional Study. Journal of Medicine. 2023 Jul 2;24(2):135-8.
9. Mokdad AA, Lopez AD, Shahraz S, Lozano R, Mokdad AH, Stanaway J, Murray CJ, Naghavi M. Liver cirrhosis mortality in 187 countries between 1980 and 2010: a systematic analysis. BMC Medicine. 2014 Sep 18;12(1):145.
10. Garcia-Tsao G, Abraldes JG, Berzigotti A, Bosch J. Portal hypertensive bleeding in cirrhosis: Risk stratification, diagnosis, and management: 2016 practice guidance by the American Association for the study of liver diseases. Hepatology. 2017 Jan;65(1):310-35.
11. D'AMICO GE. history and prognostic indicators. InPortal Hypertension in the 21st Century: The proceedings of a symposium sponsored by Axcan Pharma Inc. and NicOx SA, held in Montrél, Canada, April 2–4, 2004 2011 Jun 27 (p. 147). Springer Science & Business Media.
12. Runyon BA. Introduction to the revised American Association for the Study of Liver Diseases Practice Guideline: Management of adult patients with ascites due to cirrhosis 2012. Hepatology. 2013 Apr;57(4):1651-3.
13. North Italian Endoscopic Club for the Study and Treatment of Esophageal Varices. Prediction of the first variceal hemorrhage in patients with cirrhosis of the liver and esophageal varices. New England Journal of Medicine. 1988 Oct 13;319(15):983-9.
14. De Franchis R, Faculty BV. Expanding consensus in portal hypertension: Report of the Baveno VI Consensus Workshop: Stratifying risk and individualizing care for portal hypertension. Journal of Hepatology. 2015 Sep 1;63(3):743-52.