ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

The Burden of Liver Cirrhosis in Patients with Upper GI Hemorrhage

Nafees Ahmad[1], Muhammad Javed[2], Arbab Muhammad Kashif Khan[3], Nowsherwan[4], Amir Ullah[5], Naeem Jan[6]

1 *Senior Registrar, Department of Medicine, Peshawar Medical College, Peshawar Pakistan*
Study concept and design, Data analysis & interpretation, Manuscript writing

2 *Assistant Professor Gastroenterology, Department of Medicine, Gajju Khan Medical College/Bacha Khan Medical Complex, Swabi Pakistan*
Data analysis & Manuscript writing

3 *Assistant Professor, Department of Gastroenterology Peshawar Medical College/ Riphah International University, Islamabad Pakistan*
Research designing, Critical analysis

4 *Associate Professor, Department of Medicine, Pak International Medical College, Peshawar Pakistan*
Discussion writing, Literature search

5 *MBBS Student, Dow International Medical College, Karachi Pakistan*
Research designing, Abstract writing

6 *Assistant Professor, Department of Gastroenterology, Hayatabad Medical Complex, Peshawar Pakistan*
Data collection, Literature search, Study concept, supervision

CORRESPONDING AUTHOR
Dr. Naeem Jan
Assistant Professor, Department of Gastroenterology, Hayatabad Medical Complex, Peshawar Pakistan
Email: naeemjan78.nj@gmail.com

Submitted for Publication: 04-01-2025
Accepted for Publication 21-03-2025

How to Cite: Ahmad N, Javed M, Khan AMK, Nowsherwan, Ullah A, Jan N. The Burden of Liver Cirrhosis in Patients with Upper GI Hemorrhage. APMC 2025;19(1):53-57.
DOI: 10.29054/APMC/2025.1721

ABSTRACT

Background: Upper GI bleeding significantly impacts patients with liver cirrhosis, increasing morbidity and mortality. While variceal bleeding is the most common cause, nonvariceal bleeding presents a higher risk of severe endoscopic stigmata, potentially leading to greater complications. **Objective:** To assess the prevalence of liver cirrhosis in acute upper GI bleeding patients and its correlation with other factors. **Study Design:** Descriptive cross-sectional study. **Settings:** Department of General Medicine, Medical Teaching Institute, Khyber Teaching Hospital, Peshawar Pakistan. **Duration:** 25 Jul 2021 to 25 Jan 2022. **Methods:** This study included 195 acute upper GI bleeding patients, selected via nonprobability sampling. Patients aged 18–70 years were analyzed through clinical history, lab tests, ultrasounds, and endoscopies by specialists. Data was processed using SPSS 20, with numerical and categorical variables evaluated. **Results:** The study included 195 patients, 53.8% of whom had liver cirrhosis. The mean age was 44.38±15.23 years, with 54.4% male. Hepatitis C was more prevalent (55.4%) than Hepatitis B (44.6%). Smoking was common (67.2%), while 9.2% reported IV drug abuse. No significant associations were found between liver cirrhosis and age (P=0.178), gender (P=0.080), viral hepatitis type (P=0.739), smoking (P=0.279), IV drug abuse (P=0.879), or BMI (P=0.841). **Conclusion:** This study found a high incidence of liver cirrhosis in acute upper GI bleeding patients. A multidisciplinary strategy emphasizing early diagnosis and timely intervention is crucial for better outcomes.

Keywords: *Abdominal pain, Upper gastrointestinal bleeding, Liver cirrhosis, Hepatitis.*

INTRODUCTION

Acute upper gastrointestinal (GI) bleeding (UGIB) is a common medical emergency and a potentially life-threatening condition, frequently leading to hospitalization.[1,2] UGIB refers to bleeding originating from a site proximal to the ligament of Treitz.[3,4] The clinical signs and symptoms of acute UGIB include hematemesis, melena, hematochezia, syncope, dyspepsia, diffuse abdominal pain, dysphagia, weight loss, and jaundice.[5]

The incidence of UGIB is approximately 100 cases per 100,000 individuals per year. Bleeding from the upper GI tract is about four times more common than lower GI tract bleeding and represents a major cause of morbidity and mortality. The overall mortality rate for UGIB ranges from 6% to 10%, with a higher rate of up to 43% in patients experiencing variceal bleeding.[6,7] UGIB occurs twice as frequently in men compared to women and is more prevalent with advancing age (>60 years). Despite this, the death rate is similar between the sexes.[5,8] Even with therapeutic advances, in-hospital mortality remains significant at 13%, and re-bleeding occurs in 15% of cases.[9] In patients with UGIB, comorbidities rather than the bleeding itself are often the primary cause of death. Comorbidity conditions are present in 50.9% of patients, with similar rates in males (48.7%) and females (55.4%). Among those who die from UGIB, 98.3% have at least one comorbidity, and in 72.3% of cases, these comorbidities are the primary cause of death.[10,11] The prevalence of significant comorbidities has risen as the population

affected by UGIB has aged. A retrospective review by Yavorski *et al.,* found that 73.2% of deaths occurred in patients over the age of 60.[12]

In hospitalized patients, the causes of upper gastrointestinal bleeding (UGIB) include peptic ulcers (32-35%), esophagitis (24%), gastric erosions or gastritis (18-22%), duodenitis (13%), liver cirrhosis (11%), and other causes such as malignancies and Mallory-Weiss tears (4%).[13] Liver cirrhosis affects 4.5% to 9.5% of the global population and ranks as the 12th leading cause of death worldwide. Due to the high prevalence of chronic hepatitis B (HBV) and hepatitis C (HCV), liver cirrhosis is particularly widespread in Pakistan. At diagnosis, 30-40% of compensated cirrhotic patients have esophageal varices, while 60% of patients with ascites also develop varices. Each year, 5-10% of cirrhotic patients develop new varices.[14] Varices can grow and rupture, leading to bleeding, with a mortality rate ranging from 7% to 15%.[15] A study by Kamboj *et al.* reported that 3.6% of UGIB cases were due to varices secondary to portal hypertension caused by liver cirrhosis.[16] Banerjee *et al.* found that the prevalence of liver cirrhosis in patients with UGIB was 62.3%.[17] The initial evaluation of UGIB involves measuring orthostatic blood pressure and performing a basic metabolic profile, along with a risk scoring assessment. Additional diagnostic tests may include endoscopy, chest radiography, and nasogastric lavage. If bleeding persists and endoscopy fails to locate the source, computed tomography (CT) angiography or angiography may be necessary. Standard CT scanning and ultrasonography may be used to assess specific conditions such as cirrhosis, hemorrhagic cholecystitis, or pancreatitis with complications like pseudocyst and hemorrhage.[18]

Liver cirrhosis is endemic in Pakistan, and complications such as acute UGIB are on the rise due to a lack of awareness regarding routine screening, resulting in substantial morbidity, mortality, and economic burden.[14] Due to limited local data, this study aims to establish baseline statistics and inform future research on this complex health issue. It seeks to determine the prevalence of liver cirrhosis in patients with acute upper GI bleeding and analyze its correlation with key patient factors, including age, gender, viral hepatitis type, smoking, intravenous drug use, and body mass index, to enhance clinical understanding and management.

METHODS

The study was a descriptive cross-sectional study conducted at the Department of Medicine, Khyber Teaching Hospital, Peshawar, from July 25, 2021, to January 25, 2022. A total of 195 patients were included, with the sample size calculated using the WHO formula based on a 53.6% prevalence of liver cirrhosis in patients with acute upper gastrointestinal bleeding.[16] A 95% confidence interval and a 7% margin of error were applied. Non-probability consecutive sampling was used to select participants. The inclusion criteria comprised patients aged 18 to 70 years presenting with acute upper GI bleeding, while those with lower GI bleeding or known cases of coagulopathy, hemophilia, or von Willebrand disease were excluded.

After obtaining approval from the Institutional Review Committee of MTI Khyber Teaching Hospital (Ref. No. KTH/Gastro/2022/510), patients who met the inclusion criteria were enrolled in the study. Written informed consent was obtained from each patient or their attendant after explaining the study's purpose and benefits. Detailed demographic data, clinical history, and physical examinations were recorded. Investigations, including liver and renal function tests, viral profiles, complete blood counts, and coagulation profiles, were performed. Ultrasound abdomen examinations were conducted by a CPSP-qualified radiologist with a minimum of five years of experience, while upper GI endoscopies to confirm variceal bleeds were performed by a CPSP-qualified gastroenterologist with at least five years of clinical experience. Strict exclusion criteria were followed to avoid bias or confounding factors.

Data was analyzed using SPSS version 20. Numerical variables, such as age, body mass index (BMI), hemoglobin, platelet levels, and portal hypertension, were expressed as mean and standard deviation. Percentages and frequencies were calculated for categorical variables, including gender, type of chronic hepatitis, and liver cirrhosis. The frequency of liver cirrhosis was further stratified based on age, gender, BMI, type of viral hepatitis, smoking, and IV drug use. Post-stratification, a Chi-square test was applied, with a p-value of less than 0.05 considered statistically significant.

RESULTS

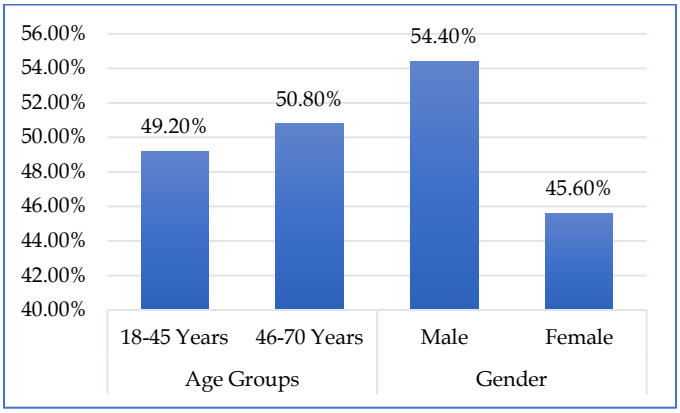
Our study comprised 195 patients, with a mean age of the participants was 44.38 years ±15.23 years. The mean hemoglobin (Hb) level was 11.14 g/dL ±1.47 g/dL. The platelet count had a mean of 100,960/µL ± 80150/µL. The average portal hypertension was recorded at 6.40 mmHg ±1.77 mmHg. The mean body mass index (BMI) was 24.68 kg/m² ± 1.03 kg/m² (Table 1).

Table 1: Demographic characteristics of the participants

Variables	Mean ± SD
Age (Years)	44.38±15.2
Hb Level (g/dL)	11.1±1.4
Platelets Count (10^3/µL)	100.9±80.1
Portal Hypertension (mmHg)	6.4±1.8
BMI (kg/m²)	24.7±1.0

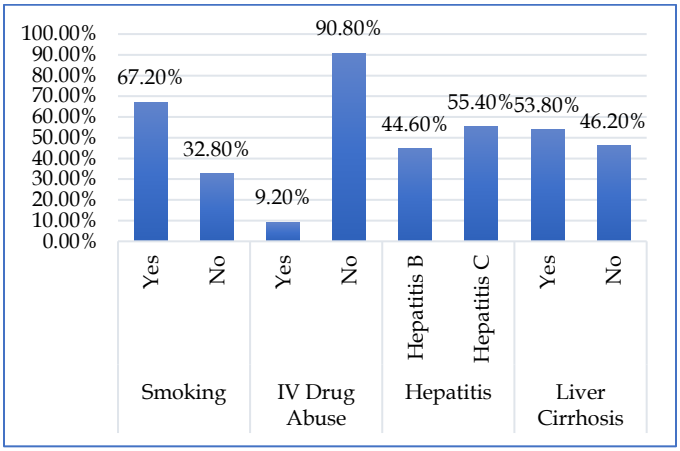
Of the 195 participants, 96 (49.2%) were aged between 18 and 45 years, while 99 (50.8%) were in the 46 to 70-year age range. In terms of gender, 106 participants (54.4%) were male, and 89 participants (45.6%) were female (Figure 1).

Figure 1: Age & gender wise distribution of participants



Among the 195 patients in the study, 131 (67.2%) were smokers, while 64 (32.8%) were non-smokers, indicating that smoking was prevalent in the majority of the participants. Regarding IV drug abuse, only 18 patients (9.2%) reported a history of intravenous drug use, while the vast majority, 177 (90.8%), did not engage in IV drug abuse. The distribution of viral hepatitis types among the study participants shows that Hepatitis C was more prevalent than Hepatitis B. Of the 195 patients, 108 (55.4%) had Hepatitis C, while 87 (44.6%) were diagnosed with Hepatitis B. About 105 patients (53.8%) were diagnosed with cirrhosis, while 90 patients (46.2%) did not have cirrhosis (Figure 2).

Figure 2: Prevalence of risk factors, hepatitis and cirrhosis among the participants



The stratification of liver cirrhosis among patients with acute upper GI bleeding based on age, gender, viral hepatitis type, smoking, intravenous (IV) drug use, and body mass index (BMI) showed no statistically significant associations. Among age groups, 49.0% of patients aged 18–45 years had cirrhosis compared to 58.6% in those aged 46–70 years (P = 0.178). Gender analysis revealed a higher prevalence in females (60.7%) than males (48.1%), but the difference was not significant (P = 0.080). Stratification by viral hepatitis type showed cirrhosis in 55.2% of Hepatitis B and 52.8% of Hepatitis C patients, with no significant difference (P = 0.739). Smoking, previously linked to liver damage due to systemic inflammation and oxidative stress, showed a cirrhosis rate of 51.1% in smokers and 59.4% in non-smokers (P = 0.279). Similarly, IV drug use had no significant impact, with 55.6% of users and 53.7% of non-users affected (P = 0.879). BMI analysis found cirrhosis in 54.7% of patients with a BMI below 25 kg/m² and 53.2% in those above 25 kg/m², again with no significant difference (P = 0.841). Post-stratification Chi-square tests confirmed that none of these factors—age, gender, viral hepatitis type, smoking, IV drug use, or BMI—were significantly associated with cirrhosis prevalence in patients presenting with upper GI bleeding (Table 2).

Table 2: Correlation analysis of liver cirrhosis with age, gender and associated risk factors

Variables		Liver Cirrhosis		
		Yes (n)	No (n)	P-value
Age Groups	18-45 Years	47	49	0.178
	46-70 Years	58	41	
	Total	105	90	
Gender	Male	51	55	0.08
	Female	54	35	
	Total	105	90	
Type of Viral Hepatitis	Hepatitis B	48	39	0.739
	Hepatitis C	57	51	
	Total	105	90	
Smoking	Yes	67	64	0.279
	No	38	26	
	Total	105	90	
IV Drug Abuse	Yes	10	8	0.879
	No	95	82	
	Total	105	90	
BMI	≤ 25 kg/m2	47	39	0.841
	> 25 kg/m2	58	51	
	Total	105	90	

DISCUSSION

In this study, we observed that 105 (53.8%) of the patients presenting with upper gastrointestinal bleeding (UGIB) had liver cirrhosis, a finding consistent with Banejee *et al.* who reported a prevalence of 62.3% in cirrhotic patients with UGIB.[17] UGIB in cirrhosis is associated with worse clinical outcomes and higher mortality rates compared to non-cirrhotic patients At At-risk for in-hospital mortality may assist in timely management and improved outcomes, highlighting the importance of understanding clinical factors associated with poor prognosis in cirrhotic UGIB patients.[19,20] In our study, patient demographic

factors such as age and gender were not significantly associated with Liver cirrhosis (P=0.178 and P=0.080, respectively). This finding suggests that more advanced liver disease predisposes patients to worse clinical outcomes when presenting with UGIB.[2]

Statistical analysis showed no significant associations between liver cirrhosis and variables such as age, gender, smoking status, IV drug use, viral hepatitis type, and BMI, reinforcing that these demographic and behavioral factors did not contribute to the increased prevalence of cirrhosis among UGIB patients. For example, age stratification (P = 0.178) and gender stratification (P = 0.080) revealed no significant differences in cirrhosis prevalence. Similarly, smoking (P = 0.279), IV drug use (P = 0.879), and viral hepatitis type (P = 0.739) also did not show a significant association with liver cirrhosis in UGIB patients.

This study's strength lies in its descriptive cross-sectional design, including consecutive UGIB patients, making the results relevant to clinical settings where UGIB etiology is often unclear before endoscopy. However, limitations include its single-center design, small sample size (n=195), and inability to establish causal relationships due to the cross-sectional nature. It also did not account for confounding variables like comorbidities or investigate specific factors contributing to both liver cirrhosis and UGIB. Future multi-center studies with larger cohorts are needed to explore clinical variables predicting mortality and morbidity in cirrhotic UGIB patients.

CONCLUSION

Our study found a high prevalence of liver cirrhosis in patients with acute upper gastrointestinal bleeding, emphasizing the complexity of managing this condition. Given the significant risk of complications, including increased morbidity and mortality, a comprehensive, multidisciplinary approach is essential. Early diagnosis, prompt interventions, and close monitoring should be prioritized for better outcomes.

LIMITATIONS

The results of this study can't be applied widely because it was only carried out in one location and had a small sample size. Furthermore, aspects like patient compliance and a thorough lifestyle history were not thoroughly investigated.

SUGGESTIONS / RECOMMENDATIONS

This study offers valuable insights into the severity of liver disease and its impact on outcomes, further research is needed to improve prognostication, clinical decision-making, and early intervention for high-risk patients in local populations.

CONFLICT OF INTEREST / DISCLOSURE

No conflicts of interest are disclosed by the authors.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude to the general medicine personnel of MTI Khyber Teaching Hospital in Peshawar for their assistance with patient care and data collecting.

SOURCE OF FUNDING

This study did not receive any outside support.

REFERENCES

1. Nigam G, Davies P, Dhiman P, Estcourt L, Grant-Casey J, Ratcliffe E, et al. Acute upper gastrointestinal bleeding in the UK: patient characteristics, diagnoses, and outcomes in the 2022 prospective audit of 5000 patients. Endoscopy. 2024 Apr;56(S 02):MP049.
2. Lam KL, Wong JC, Lau JY. Pharmacological Treatment in Upper Gastrointestinal Bleeding. Curr Treat Options Gastroenterol. 2015 Dec;13(4):369-76.
3. Carballo F, Albillos A, Llamas P, Orive A, Redondo-Cerezo E, Rodríguez de Santiago E, et al. Consensus document of the Spanish Society of Digestives Diseases and the Spanish Society of Thrombosis and Haemostasis on massive nonvariceal gastrointestinal bleeding and direct-acting oral anticoagulants. Rev Esp Enferm Dig. 2022 Jul;114(7):375-389.
4. Reeves PT, James-Davis L, Khan MA. Gastrointestinal Bleeding in the Neonate: Updates on Diagnostics, Therapeutics, and Management. Neoreviews. 2023 Jul 1;24(7):e403-e413.
5. Fahim M, Sohail M, Khan MS, Khan FU, Rashid SU, Akhter S. Frequency of Bleeding Duodenal Ulcer in Patients Presenting with Upper Gastrointestinal Bleeding: Frequency of Duodenal Ulcer in patients with Gastrointestinal Bleeding. Pakistan Journal of Health Sciences. 2022 Nov 30:88-92.
6. Oakland K. Changing epidemiology and etiology of upper and lower gastrointestinal bleeding. Best Pract Res Clin Gastroenterol. 2019 Oct-Dec;42-43:101610.
7. Alshahrani AS, Aedh AI, Alshehri WM, Sahib AA, Alwadai SD, Almurdhimah YA, et al. Assessment of the Causes and Endoscopic Findings in Patients Presented with Upper Gastrointestinal Bleeding: A Single Center Experience. Bahrain Medical Bulletin. 2023 Dec 1;45(4).
8. Barletta JF, Bruno JJ, Buckley MS, Cook DJ. Stress ulcer prophylaxis. Crit Care Med. 2016 Jul;44(7):1395–405.
9. Contreras-Omaña R, Alfaro-Reynoso JA, Cruz-Chávez CE, Velarde-Ruiz Velasco A, Flores-Ramírez DI, Romero-Hernández I, et al. The Progetto Nazionale Emorragia Digestiva (PNED) system vs. the Rockall score as mortality predictors in patients with nonvariceal upper gastrointestinal bleeding: A multicenter prospective study. Rev Gastroenterol Mex. 2017 Apr-Jun;82(2):123-128.
10. Zheng Y, Zhang N, Tse G, Li G, Lip GYH, Liu T. Co-administered oral anticoagulants with nonsteroidal anti-inflammatory drugs and the risk of bleeding: A systematic review and meta-analysis. Thromb Res. 2023 Oct 22;232:15-26.
11. Shung DL, Au B, Taylor RA, Tay JK, Laursen SB, Stanley AJ, et al. Validation of a Machine Learning Model That Outperforms Clinical Risk Scoring Systems for Upper Gastrointestinal Bleeding. Gastroenterology. 2020 Jan;158(1):160-167.
12. Malhotra P, Sanwariya Y, Vohra M, Lakshay S. Pseudo upper GI bleed in prisoners. J Clin Images Med Case Rep. 2022;3(12):2210.
13. Tari E, Frim L, Stolcz T, Teutsch B, Veres DS, Hegyi P, Erőss B. At admission hemodynamic instability is associated with increased mortality and rebleeding rate in acute gastrointestinal bleeding: a

systematic review and meta-analysis. Therap Adv Gastroenterol. 2023 Aug 30;16:17562848231190970.
14. Rohani P, Rezghi M, Imanzadeh F, Kamfar S, Hajipour M. Etiology, Presenting Features, and Endoscopic Findings of Portal Vein Hypertension in Children. Journal of Comprehensive Pediatrics. 2023 Jan 1;14(2).
15. Alruzug IM, Aldarsouny TA, Semaan T, Aldaher MK, AlMustafa A, Azzam N, et al. Time trends of causes of upper gastrointestinal bleeding and endoscopic findings. Saudi Journal of Gastroenterology. 2021 Jan 1;27(1):28-34.
16. Kamboj AK, Hoversten P, Leggett CL. Upper Gastrointestinal Bleeding: Etiologies and Management. Mayo Clin Proc. 2019 Apr;94(4):697-703.
17. Banerjee A, Bishnu S, Dhali GK. Acute upper gastrointestinal bleed: An audit of the causes and outcomes from a tertiary care center in eastern India. Indian J Gastroenterol. 2019 Jun;38(3):190-202.
18. Lee HA, Jung HK, Kim TO, Byeon JR, Jeong ES, Cho HJ, et al. Clinical outcomes of acute upper gastrointestinal bleeding according to the risk indicated by Glasgow-Blatchford risk score-computed tomography score in the emergency room. Korean J Intern Med. 2022 Nov;37(6):1176-1185.
19. Tiriveedhi K, Simon J, Cerulli MA. Does Gastric Lavage Reduce the Detection of Helicobacter Pylori in the Biopsy Specimens?. Gastrointestinal Endoscopy. 2007 Apr 1;65(5):AB312.
20. Boonpongmanee S, Fleischer DE, Pezzullo JC, Collier K, Mayoral W, Al-Kawas F, Chutkan R, Lewis JH, Tio TL, Benjamin SB. The frequency of peptic ulcer as a cause of upper-GI bleeding is exaggerated. Gastrointest Endosc. 2004 Jun;59(7):788-94.