

# Frequency of Peptic Ulcer Disease in Patients with Chronic Liver Disease Presenting with Upper Gastrointestinal Bleeding

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## Abstract

**Background:** Peptic ulcer disease (PUD) is a significant cause of morbidity and mortality worldwide, particularly in patients with chronic liver disease (CLD). The occurrence of upper gastrointestinal bleeding (UGIB) in CLD patients presents a serious complication, often requiring urgent medical intervention.

**Objective:** The main objective of this study was to determine the frequency of peptic ulcer disease in patients with chronic liver disease presenting with upper gastrointestinal bleeding.

**Methods:** This retrospective observational study was conducted at Ayub Teaching Hospital, Abbottabad, from 2021 to 2023. Data were collected from 105 patients diagnosed with chronic liver disease who presented with symptoms of upper gastrointestinal bleeding. The diagnosis of CLD was confirmed through clinical evaluation, biochemical tests, imaging studies, and/or liver biopsy. Patients included were aged 18 years and above and presented with UGIB evidenced by hematemesis, melena, or both. Exclusion criteria were individuals with bleeding disorders unrelated to CLD and those who did not undergo endoscopic evaluation. Data collection involved demographic information, clinical history, duration and etiology of CLD, comorbid conditions, and UGIB presentation. Upper gastrointestinal endoscopy was performed on all patients to identify the source of bleeding. Statistical analysis was performed using SPSS version 25, with a p-value of less than 0.05 considered statistically significant.

**Results:** The study included 105 patients, with a mean age of 55.3±3.27 years; 65 (61.9%) were male, and 40 (38.1%) were female. The etiologies of CLD were viral hepatitis (42.9%), alcoholic liver disease (28.6%), non-alcoholic fatty liver disease (19.0%), and other causes (9.5%). Clinical presentations of UGIB included hematemesis (66.7%), melena (23.8%), and both (9.5%). Endoscopic findings revealed that 35 patients (33.3%) had peptic ulcer disease, with 20 (57.1%) having duodenal ulcers and 15 (42.9%) having gastric ulcers. Other sources of UGIB included esophageal varices (38.1%), gastric varices (14.3%), erosive gastritis (9.5%), and malignancies (4.8%). Associated risk factors for PUD included NSAID use (42.9%), smoking (28.6%), and coexisting portal hypertension (71.4%). The mean size of ulcers was 10.2 mm. Endoscopic therapy was utilized in 71.4% of cases, with pharmacological treatment primarily including proton pump inhibitors (85.7%). Complications included rebleeding within 7 days (14.3%) and the need for surgical intervention (5.7%). The mean hospital stay was 7.8 days, and in-hospital mortality was observed in 8.6% of patients.

**Conclusion:** Peptic ulcer disease represents a substantial yet manageable complication in patients with chronic liver disease presenting with upper gastrointestinal bleeding. Prompt recognition and targeted therapeutic interventions are crucial for optimizing outcomes in this high-risk population.

## 1 Introduction

Peptic ulcer disease (PUD) is a significant cause of morbidity and mortality worldwide, characterized by the presence of ulcers in the stomach lining or the first part of the small intestine. The relationship between PUD and chronic liver disease (CLD) is multifaceted and complex, influenced by various factors such as portal hypertension, coagulopathy, and the use of nonsteroidal anti-inflammatory drugs (NSAIDs) (1). Patients with CLD are at a heightened risk of developing upper gastrointestinal bleeding (UGIB), a serious complication that frequently results in increased hospitalizations and healthcare burden. UGIB is a clinical condition characterized by hemorrhage proximal to the ligament of Treitz, often presenting as hematemesis or melena (2). The prevalence of UGIB is estimated to be about 100 per 100,000 population per year, with upper gastrointestinal tract bleeding being approximately three to four times more common than lower gastrointestinal bleeding. Mortality rates from UGIB range between 6-10% in the general population (3).

UGIB can be classified into variceal and non-variceal bleeding. In patients with CLD, UGIB is a frequent emergency clinical condition requiring prompt in-patient care and resuscitation. Variceal hemorrhage, a common source of UGIB in CLD, is associated with high morbidity and mortality. Other significant sources include gastroduodenal erosions and peptic ulcers, which remain a critical area of concern due to their potential for causing severe bleeding and necessitating urgent medical intervention (4). Previous studies have highlighted the prevalence of UGIB in patients with CLD, noting that peptic ulcers are the most frequent type of UGIB, accounting for approximately 50% of cases, followed by esophageal varices, Mallory-Weiss tears, tumors, erosions, and arteriovenous malformations (5). The hemodynamic state of patients with suspected UGIB is crucial, as early intervention in unstable patients with acute UGIB is associated with reduced mortality (6).

Understanding the frequency and underlying factors of PUD in patients with CLD presenting with UGIB is essential for improving diagnostic strategies, therapeutic approaches, and overall patient outcomes. This study aims to elucidate the prevalence of peptic ulcer disease among patients with chronic liver disease who present with upper gastrointestinal bleeding. By identifying the specific characteristics and risk factors associated with PUD in this high-risk population, we hope to enhance clinical practices and develop more effective management guidelines. The retrospective observational nature of this study allows for a comprehensive analysis of patient data collected from Ayub Teaching Hospital, Abbottabad, over a two-year period. This data encompasses a wide range of variables, including demographic information, clinical history, comorbid conditions, and detailed endoscopic findings, which together provide a robust foundation for our investigation (7).

In this study, we focused on patients diagnosed with chronic liver disease, confirmed through clinical evaluation, biochemical tests, imaging studies, and/or liver biopsy, and who presented with symptoms of upper gastrointestinal bleeding. The inclusion criteria were adults aged 18 years and above, with a confirmed diagnosis of CLD, and presentation with UGIB, evidenced by hematemesis, melena, or both. Patients with bleeding disorders unrelated to CLD and those who did not undergo endoscopic evaluation were excluded. Upper gastrointestinal endoscopy was performed on all patients to identify the source of bleeding, documenting the presence, location, size, and stigmata of recent hemorrhage of peptic ulcers, as well as other potential sources of bleeding such as varices, erosive gastritis, and malignancies (8).

The findings of this study are expected to provide valuable insights into the prevalence and clinical characteristics of peptic ulcer disease in patients with chronic liver disease presenting with upper gastrointestinal bleeding. By analyzing the data and identifying key trends and associations, we aim to contribute to the broader understanding of UGIB management in CLD patients, ultimately improving patient care and outcomes.

## 2 Material and methods

This retrospective observational study was conducted at Ayub Teaching Hospital, Abbottabad, from 2021 to 2023, involving patients diagnosed with chronic liver disease (CLD) who presented with symptoms of upper gastrointestinal bleeding (UGIB). The study included a sample size of 105 patients. The diagnosis of CLD was confirmed through clinical evaluation, biochemical tests, imaging studies, and/or liver biopsy, and patients were included irrespective of the etiology of their liver disease. The inclusion criteria comprised adults aged 18 years and above, with a confirmed diagnosis of CLD, and presenting with UGIB, evidenced by hematemesis, melena, or both. Patients with bleeding disorders unrelated to CLD and those who did not undergo endoscopic evaluation were excluded from the study. Data collection was carried out using the hospital's electronic medical records system. Key variables included demographic information, clinical history, duration and etiology of CLD, comorbid conditions, and details of UGIB presentation, symptoms, and hemodynamic stability at presentation. Upper gastrointestinal endoscopy was performed on all patients to identify the source of bleeding. The presence of peptic ulcers, along with their location, size, and stigmata of recent hemorrhage, was meticulously documented. Other findings such as varices, erosive gastritis, and malignancies were also noted.

Ethical approval for the study was obtained from the institutional review board of Ayub Teaching Hospital, and the study was conducted in accordance with the principles of the Declaration of Helsinki. Informed consent was obtained from all patients or their legal guardians before the commencement of any study-related procedures.

The data analysis was performed using SPSS software version 25. Descriptive statistics were employed to summarize patient demographics and clinical characteristics. Continuous variables were presented as means and standard deviations, while categorical variables were expressed as frequencies and percentages. The chi-square test was used to compare categorical variables, and independent t-tests were applied for continuous variables. A p-value of less than 0.05 was considered statistically significant.

The clinical presentation of UGIB, including hematemesis, melena, or both, and the hemodynamic stability at presentation, were assessed. Endoscopic findings were recorded in detail, focusing on the identification of peptic ulcers, their location, and characteristics, as well as other potential sources of bleeding. The presence of stigmata of recent hemorrhage was also noted. The collected data were analyzed to determine the frequency of peptic ulcer disease among patients with chronic liver disease presenting with upper gastrointestinal bleeding.

This comprehensive approach ensured that all relevant aspects of the patient’s clinical profile were considered, providing a robust foundation for understanding the prevalence and characteristics of peptic ulcer disease in this specific patient population. By adhering to rigorous data collection and analysis protocols, the study aimed to contribute valuable insights into the management of UGIB in patients with CLD, ultimately enhancing patient outcomes and clinical practices (1).

**3 Results**

The study included 105 patients diagnosed with chronic liver disease (CLD) who presented with upper gastrointestinal bleeding (UGIB). The mean age of the patients was 55.3±3.27 years. There were 61.9% male and 38.1% female patients. The etiologies of CLD were as follows: viral hepatitis in 45 patients (42.9%), alcoholic liver disease in 30 patients (28.6%), non-alcoholic fatty liver disease in 20 patients (19.0%), and other causes in 10 patients (9.5%). The clinical presentation of UGIB included hematemesis in 70 patients (66.7%), melena in 25 patients (23.8%), and both hematemesis and melena in 10 patients (9.5%). Hemodynamic stability at presentation was observed in 80 patients (76.2%), while 25 patients (23.8%) were unstable.

Endoscopic findings revealed that 35 patients (33.3%) had peptic ulcer disease (PUD), with duodenal ulcers present in 20 patients (57.1% of PUD cases) and gastric ulcers in 15 patients (42.9% of PUD cases). Other sources of upper gastrointestinal bleeding (UGIB) included esophageal varices in 40 patients (38.1%), gastric varices in 15 patients (14.3%), erosive gastritis in 10 patients (9.5%), and malignancies in 5 patients (4.8%).

The characteristics of peptic ulcer disease (PUD) in patients with chronic liver disease (CLD) are detailed in Table 2. Among the patients with PUD, 20 (57.1%) had duodenal ulcers, and 15 (42.9%) had gastric ulcers. Regarding stigmata of hemorrhage, 10 patients (28.6%) showed active bleeding, 15 patients (42.9%) had a non-bleeding visible vessel, 5 patients (14.3%) had an adherent clot, and 5 patients (14.3%) had a flat spot. The mean size of the ulcers was 10.2 mm, ranging from 5 to 20 mm. Associated risk factors included the use of NSAIDs in 15 patients (42.9%), a history of smoking in 10 patients (28.6%), and coexisting portal hypertension in 25 patients (71.4%).

**Table 1: Demographic and Clinical Characteristics of Patients**

Characteristic	Number (%) or Mean (Range)
<b>Total Number of Patients</b>	105
<b>Mean Age (years)</b>	55.3±3.27
<b>Gender - Male</b>	65 (61.9%)
<b>Gender - Female</b>	40 (38.1%)
<b>Etiology of CLD - Viral hepatitis</b>	45 (42.9%)
<b>Etiology of CLD - Alcoholic liver disease</b>	30 (28.6%)
<b>Etiology of CLD - Non-alcoholic fatty liver disease</b>	20 (19.0%)
<b>Etiology of CLD - Other causes</b>	10 (9.5%)
<b>Clinical Presentation of UGIB - Hematemesis</b>	70 (66.7%)
<b>Clinical Presentation of UGIB - Melena</b>	25 (23.8%)
<b>Clinical Presentation of UGIB - Both hematemesis and melena</b>	10 (9.5%)
<b>Hemodynamic Stability at Presentation - Stable</b>	80 (76.2%)
<b>Hemodynamic Stability at Presentation - Unstable</b>	25 (23.8%)

**Table 2: Endoscopic Findings and Comparison of Patients with and without PUD**

Endoscopic Findings	Number (%)	P-value
<b>Presence of Peptic Ulcer Disease (PUD) - Total with PUD</b>	35 (33.3%)	
<b>Presence of Peptic Ulcer Disease (PUD) - Duodenal ulcers</b>	20 (57.1%)	
<b>Presence of Peptic Ulcer Disease (PUD) - Gastric ulcers</b>	15 (42.9%)	
<b>Other Sources of UGIB - Esophageal varices</b>	40 (38.1%)	

<b>Other Sources of UGIB - Gastric varices</b>	15 (14.3%)	
<b>Other Sources of UGIB - Erosive gastritis</b>	10 (9.5%)	
<b>Other Sources of UGIB - Malignancies</b>	5 (4.8%)	
<b>Comparison of Patients with and without PUD - Mean Age (years) - With PUD</b>	56.7	0.35
<b>Comparison of Patients with and without PUD - Mean Age (years) - Without PUD</b>	54.5	
<b>Comparison of Patients with and without PUD - Gender Distribution - Male</b>	57.1%	
<b>Comparison of Patients with and without PUD - Gender Distribution - Female</b>	42.9%	
<b>Comparison of Patients with and without PUD - Hemodynamic Stability at Presentation - Stable</b>	80.0% vs. 74.3%	
<b>Comparison of Patients with and without PUD - Hemodynamic Stability at Presentation - Unstable</b>	20.0% vs. 25.7%	

**Table 3: Characteristics of Peptic Ulcer Disease (PUD) in Patients with CLD**

Peptic Ulcer Characteristics	Number (%)
<b>Location of Ulcers - Duodenal ulcers</b>	20 (57.1%)
<b>Location of Ulcers - Gastric ulcers</b>	15 (42.9%)
<b>Stigmata of Hemorrhage - Active bleeding</b>	10 (28.6%)
<b>Stigmata of Hemorrhage - Non-bleeding visible vessel</b>	15 (42.9%)
<b>Stigmata of Hemorrhage - Adherent clot</b>	5 (14.3%)
<b>Stigmata of Hemorrhage - Flat spot</b>	5 (14.3%)
<b>Size of Ulcers (mm) - Mean size (range)</b>	10.2 (5-20)
<b>Associated Risk Factors - Use of NSAIDs</b>	15 (42.9%)
<b>Associated Risk Factors - History of smoking</b>	10 (28.6%)
<b>Associated Risk Factors - Coexisting portal hypertension</b>	25 (71.4%)

**Table 4: Management and Outcomes of Patients with Peptic Ulcer Disease (PUD) in CLD**

Management and Outcomes	Number (%)
<b>Endoscopic Therapy - Injection therapy</b>	25 (71.4%)
<b>Endoscopic Therapy - Thermal therapy</b>	20 (57.1%)
<b>Endoscopic Therapy - Mechanical therapy</b>	10 (28.6%)
<b>Pharmacological Treatment - Proton pump inhibitors (PPIs)</b>	30 (85.7%)
<b>Pharmacological Treatment - H2-receptor antagonists</b>	10 (28.6%)
<b>Transfusion Requirement - Packed red blood cells</b>	15 (42.9%)
<b>Complications - Rebleeding within 7 days</b>	5 (14.3%)
<b>Complications - Need for surgical intervention</b>	2 (5.7%)
<b>Length of Hospital Stay (days) - Mean (range)</b>	7.8 (3-15)
<b>Mortality - In-hospital mortality</b>	3 (8.6%)

The study revealed that among the patients with PUD, 57.1% had duodenal ulcers, and 42.9% had gastric ulcers. The mean size of the ulcers was 10.2 mm, ranging from 5 to 20 mm. Associated risk factors included the use of NSAIDs in 42.9% of patients, a history of smoking in 28.6% of patients, and coexisting portal hypertension in 71.4% of patients. Endoscopic therapy was utilized in many cases, with injection therapy applied in 71.4% of patients, thermal therapy in 57.1%, and mechanical therapy in 28.6%. Pharmacological treatment primarily included proton pump inhibitors (PPIs), administered to 85.7% of patients, while H2-receptor antagonists were used in 28.6%.

Regarding outcomes, 42.9% of patients required packed red blood cell transfusions. Complications included rebleeding within 7 days in 14.3% of patients and the need for surgical intervention in 5.7%. The mean length of hospital stay was 7.8 days, ranging from 3 to 15 days. In-hospital mortality was observed in 8.6% of patients. Overall, the study highlights the significant prevalence of peptic ulcer disease in patients with chronic liver disease presenting with upper gastrointestinal bleeding, underscoring the importance of early diagnosis and targeted therapeutic interventions.

**4 Discussion**

Peptic ulcer disease (PUD) remains a significant cause of upper gastrointestinal bleeding (UGIB) in patients with chronic liver disease (CLD), as evidenced by the findings of this study. Approximately one-third of the patients with CLD presenting with UGIB were found to have underlying peptic ulcers. This prevalence aligns with previous studies, underscoring the need for clinicians to consider PUD as a

primary diagnosis in this high-risk population (9-11). The multifaceted relationship between PUD and CLD, influenced by factors such as portal hypertension, coagulopathy, and the use of NSAIDs, highlights the complexity of managing these patients (12,13).

The demographic and clinical characteristics of the patients with PUD did not differ significantly from those without PUD, indicating that the presence of ulcers in CLD-related UGIB is influenced more by general risk factors such as NSAID use and smoking rather than specific demographic variables. This finding is consistent with previous research, which also reported that these factors exert a significant influence on the incidence of ulcers in CLD patients (14). The study further demonstrated that patients with PUD had a high prevalence of associated risk factors, including NSAID use, a history of smoking, and coexisting portal hypertension, which have been well-documented in the literature (15).

Endoscopic findings in this study revealed that duodenal ulcers were more common than gastric ulcers among PUD patients, with a majority showing stigmata of recent hemorrhage, necessitating immediate intervention. The frequent use of endoscopic therapies such as injection therapy, thermal coagulation, and mechanical methods underscores the critical role of endoscopic management in controlling hemorrhage and preventing rebleeding (Romstad et al., 2020). The importance of early endoscopic evaluation in CLD patients presenting with UGIB cannot be overstated, as it significantly impacts patient outcomes by allowing for timely therapeutic interventions (16).

Despite the high morbidity associated with UGIB in CLD patients, the mortality rate within the study sample was relatively low, which may be attributed to the early detection and modernized treatment protocols employed. This finding is encouraging and suggests that with appropriate management strategies, the outcomes for CLD patients with PUD can be significantly improved (Bhattarai, 2020). However, the study also highlighted several complications, including rebleeding and the need for surgical intervention, which continue to pose challenges in the clinical management of these patients.

The strengths of this study include its comprehensive data collection and analysis, which provided a robust foundation for understanding the prevalence and characteristics of PUD in CLD patients with UGIB. The use of a well-defined patient cohort and standardized diagnostic criteria ensured the reliability of the findings. Additionally, the study's retrospective design allowed for the analysis of a large sample size over an extended period, enhancing the generalizability of the results.

However, the study also had several limitations. The retrospective nature of the study may have introduced selection bias, and the reliance on electronic medical records could have resulted in incomplete data capture. Moreover, the study was conducted at a single center, which may limit the generalizability of the findings to other settings. Future research should aim to include multiple centers and prospective data collection to validate these findings further and address the potential biases inherent in retrospective studies.

In conclusion, this study underscores the substantial prevalence of peptic ulcer disease in patients with chronic liver disease presenting with upper gastrointestinal bleeding. The findings highlight the need for prompt recognition and targeted therapeutic interventions, including endoscopic hemostasis and pharmacological management, to optimize patient outcomes. Clinicians should be vigilant in identifying and managing PUD in this high-risk population, considering the significant morbidity associated with UGIB. Future research should focus on refining diagnostic strategies and developing standardized treatment protocols to further improve the management of PUD in CLD patients (17).

## 5 Conclusion

In conclusion, In patients with chronic liver disease presenting with upper gastrointestinal bleeding, peptic ulcer disease emerges as a substantial yet manageable complication. The findings of this study underscore the importance of prompt recognition and targeted therapeutic interventions to optimize outcomes in this high-risk population. Early diagnostic strategies, including thorough clinical evaluations and timely endoscopic examinations, are essential in identifying peptic ulcers and other potential sources of bleeding. Implementing appropriate treatment protocols, such as endoscopic hemostasis and pharmacological management with proton pump inhibitors, can significantly reduce the morbidity and mortality associated with peptic ulcer disease in these patients. Furthermore, addressing associated risk factors, such as the use of NSAIDs and smoking, through patient education and lifestyle modifications, can help prevent the recurrence of ulcers and improve overall patient outcomes. By focusing on these comprehensive management approaches, healthcare providers can enhance the quality of care and improve the prognosis for patients with chronic liver disease and upper gastrointestinal bleeding.

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<b>Disclaimers</b>	
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