



CLINICAL AND ETIOLOGICAL SPECTRUM OF UPPER GASTROINTESTINAL BLEEDING IN A TERTIARY CARE HOSPITAL IN NORTH INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Upper gastrointestinal (UGI) bleeding is a common and potentially life-threatening emergency encountered in clinical practice. The etiological spectrum varies across regions depending on underlying risk factors such as chronic liver disease, alcohol use, and NSAID consumption. Understanding regional patterns is essential for effective management and prevention.

Objectives: To assess the clinical presentation and etiological profile of patients presenting with upper gastrointestinal bleeding in a tertiary care hospital in North India.

Methods: A hospital-based cross-sectional study was conducted over 11 months (September 2021 to July 2022) including 85 adult patients presenting with hematemesis and/or melena. Data were collected using a pretested semi-structured proforma. All patients underwent upper gastrointestinal endoscopy to determine the etiology. Descriptive and inferential statistical analyses were performed using SPSS version 20.0, with $p < 0.05$ considered statistically significant.

Results: The majority of patients were in the age group of 46–60 years, with a male predominance. Combined hematemesis and melena was the most common presentation. Alcohol consumption and chronic liver disease were the major risk factors identified. Endoscopic findings revealed esophageal varices as the most common cause of UGI bleeding, followed by peptic ulcer disease. A statistically significant association was found between chronic liver disease and variceal bleeding ($p < 0.001$).

Conclusion: Esophageal varices and peptic ulcer disease are the predominant causes of UGI bleeding in this setting. Early recognition of risk factors, especially chronic liver disease, along with timely endoscopic intervention, is essential for improving outcomes. Preventive strategies targeting modifiable risk factors are crucial to reduce disease burden.

Keywords: Upper gastrointestinal bleeding; Esophageal varices; Peptic ulcer disease; Chronic liver disease; Endoscopy; Risk factors

INTRODUCTION

Upper gastrointestinal (UGI) bleeding remains a significant global medical emergency, contributing substantially to morbidity, mortality, and healthcare burden despite advances in diagnostic and therapeutic modalities. It encompasses bleeding originating proximal to the ligament of Treitz and presents clinically with hematemesis, melena, or both. The annual incidence of UGI bleeding has been estimated at 50–150 per 100,000 population worldwide, with mortality rates ranging from 5% to 14% depending on patient characteristics and healthcare settings [1]. Although improvements in endoscopic therapy and pharmacological management have led to better outcomes, UGI bleeding continues to pose challenges due to its diverse etiology and variable clinical presentation [2].

Globally, peptic ulcer disease remains the most common cause of UGI bleeding, accounting for approximately 30–50% of cases, followed by esophageal varices, erosive mucosal disease, and malignancies [3]. The epidemiological pattern, however, varies across regions due to differences in risk factors such as prevalence of *Helicobacter pylori* infection, use of non-steroidal anti-inflammatory drugs (NSAIDs), alcohol consumption, and chronic liver disease [4]. In developed countries, a decline in peptic ulcer-related bleeding has been observed, attributed to effective eradication therapy and proton pump inhibitors, whereas variceal bleeding remains a predominant cause in regions with high burden of chronic liver disease [5].

In the Indian context, UGI bleeding represents a common cause of emergency hospital admissions, particularly in tertiary care centers. Studies from various parts of India indicate that esophageal varices secondary to portal hypertension, often related to chronic liver disease, constitute a leading cause, followed by peptic ulcer disease [6]. The high prevalence of alcohol-related liver disease, viral hepatitis, and limited access to early healthcare services contribute to this pattern [7]. Additionally, widespread over-the-counter use of NSAIDs and delayed presentation further complicate the clinical scenario [8].

At the local level, tertiary care hospitals in North India cater to a heterogeneous population, including referrals from rural and semi-urban areas, often presenting with advanced disease and complications. Variability in etiological patterns, demographic characteristics, and clinical outcomes necessitates region-specific data to guide effective management strategies. Despite the availability of several studies, there remains a paucity of updated, institution-specific data that comprehensively evaluates both the clinical presentation and etiological spectrum of UGI bleeding in this setting [9].

Understanding the clinical profile and underlying causes of UGI bleeding is essential for early risk stratification, timely intervention, and improved patient outcomes. Identification of predominant etiologies can aid in optimizing resource allocation, developing preventive strategies, and tailoring management protocols specific to regional needs. Furthermore, documenting the spectrum of disease in a tertiary care setup provides valuable insights for clinicians, policymakers, and researchers alike [10].

In this context, the present study was undertaken to assess the clinical presentation and etiological profile of patients presenting with upper gastrointestinal bleeding at a tertiary care hospital in North India. The objective of the study was to evaluate the demographic characteristics, clinical features, and endoscopic findings to identify the predominant causes and patterns of UGI bleeding in the study population.

METHODOLOGY

Study Design: This study was a hospital-based observational descriptive cross-sectional study conducted to evaluate the clinical and etiological profile of patients presenting with upper gastrointestinal bleeding.

Study Setting: The study was conducted in the Department of Medicine in collaboration with the Department of Gastroenterology at a tertiary care teaching hospital in North India, catering to both urban and rural populations.

Study Duration: The study was carried out over a period of 11 months from September 2021 to July 2022.

Study Population: The study population included all adult patients presenting with features suggestive of upper gastrointestinal bleeding, such as hematemesis, melena, or both, who were admitted to the hospital during the study period.

Inclusion Criteria

- Patients aged ≥ 18 years
- Patients presenting with clinical features of upper gastrointestinal bleeding (hematemesis and/or melena)
- Patients who underwent upper gastrointestinal endoscopy during hospital stay
- Patients who provided informed consent

Exclusion Criteria

- Patients with lower gastrointestinal bleeding
- Patients in whom endoscopy could not be performed due to contraindications or poor general condition
- Patients unwilling to participate or not providing consent
- Patients with incomplete clinical or endoscopic data

Sample Size: The sample size was calculated using the formula for estimating a proportion in a cross-sectional study:

$$n = Z^2 \times p \times q / d^2$$

Where:

- $Z = 1.96$ (standard normal variate at 95% confidence level)
- p = prevalence of peptic ulcer as a cause of UGI bleeding (assumed 50% based on prior studies for maximum sample size)
- $q = 1 - p = 50\%$
- d = allowable error = 10%

$$n = (1.96)^2 \times 0.5 \times 0.5 / (0.1)^2 = 96$$

Considering feasibility constraints and patient availability during the study period, a total of 85 patients were included in the study.

Sampling Technique: A consecutive sampling technique was employed, wherein all eligible patients presenting during the study period and meeting the inclusion criteria were enrolled until the desired sample size was achieved.

Data Collection Tools & Procedure: Data were collected using a predesigned, pretested semi-structured proforma. Upon admission, detailed history was obtained regarding presenting complaints (hematemesis, melena), duration of symptoms, drug intake (especially NSAIDs), alcohol consumption, and comorbid conditions such as chronic liver disease. A thorough clinical examination was performed, including assessment of vital parameters and signs of anemia or liver disease. Baseline

laboratory investigations such as complete blood count, liver function tests, renal function tests, and coagulation profile were conducted. All patients underwent upper gastrointestinal endoscopy after hemodynamic stabilization, and findings were recorded, including the source and nature of bleeding.

Study Variables: Independent variables included demographic factors (age, sex), behavioral factors (alcohol intake, NSAID use), and clinical characteristics (symptom type, comorbidities such as chronic liver disease). Dependent variables included etiological diagnosis based on endoscopic findings (e.g., varices, peptic ulcer disease, erosive gastritis, malignancy) and clinical presentation patterns. The relationship between risk factors and specific etiologies was also explored.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 20.0. Descriptive statistics were used to summarize the data, with categorical variables expressed as frequencies and percentages and continuous variables as mean $\pm$ standard deviation. Inferential statistics were applied using the Chi-square test or Fisher's exact test, as appropriate, to assess associations between categorical variables. A p-value of <0.05 was considered statistically significant.

Ethical Considerations: Written informed consent was obtained from all participants prior to inclusion in the study. Confidentiality and anonymity of patient information were strictly maintained. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

RESULTS

A total of 85 patients with upper gastrointestinal bleeding were included in the study. The majority of patients belonged to the age group of 46–60 years, with a male predominance (Table 1).

Table 1: Demographic Characteristics of Study Participants (n = 85)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–30	14	16.5
	31–45	26	30.6
	46–60	28	32.9
	>60	17	20.0
Gender	Male	58	68.2
	Female	27	31.8

The most common clinical presentation was a combination of hematemesis and melena, observed in more than half of the patients. Pallor was the most frequent clinical sign, followed by shock at admission (Table 2).

Table 2: Clinical Presentation of Patients with UGI Bleeding (n = 85)

Clinical Feature	Frequency (n)	Percentage (%)
Hematemesis only	24	28.2
Melena only	18	21.2
Both	43	50.6
Shock at admission	19	22.4
Pallor	61	71.8

Among risk factors, alcohol consumption was the most prevalent, followed by chronic liver disease and smoking. A significant proportion of patients also reported NSAID use (Table 3).

Table 3: Risk Factors among Study Participants (n = 85)

Risk Factor	Present (n)	Percentage (%)
Alcohol consumption	39	45.9
NSAID use	21	24.7
Chronic liver disease	34	40.0
Smoking	28	32.9

Endoscopic evaluation revealed that esophageal varices were the most common cause of upper gastrointestinal bleeding, followed by peptic ulcer disease. Other causes included erosive mucosal disease, Mallory-Weiss tear, and malignancy (Table 4).

Table 4: Etiological Profile Based on Endoscopic Findings (n = 85)

Etiology	Frequency (n)	Percentage (%)
Esophageal varices	36	42.4
Peptic ulcer disease	28	32.9
Erosive gastritis/duodenitis	12	14.1
Mallory-Weiss tear	5	5.9
Upper GI malignancy	4	4.7

A statistically significant association was found between chronic liver disease and variceal bleeding ($p < 0.001$), indicating that patients with underlying liver disease were at a significantly higher risk of variceal hemorrhage (Table 5).

Table 5: Association between Chronic Liver Disease and Variceal Bleeding

Chronic Liver Disease	Variceal Bleeding Present	Variceal Bleeding Absent	Total
Present	29	5	34
Absent	7	44	51
Total	36	49	85

Chi-square = 34.6, $p < 0.001$ (Statistically significant)

DISCUSSION

The present study evaluated the clinical and etiological profile of upper gastrointestinal (UGI) bleeding among patients presenting to a tertiary care hospital in North India. The findings demonstrated that UGI bleeding predominantly affected middle-aged individuals with a clear male preponderance. The most common clinical presentation was a combination of hematemesis and melena, and esophageal varices emerged as the leading cause of bleeding, followed by peptic ulcer disease. Additionally, a strong and statistically significant association was observed between chronic liver disease and variceal bleeding. The predominance of males (68.2%) in the present study is consistent with earlier studies, which have reported higher incidence of UGI bleeding among males due to increased exposure to risk factors such as alcohol consumption and smoking [1,6]. The majority

of patients belonged to the age group of 46–60 years, reflecting the cumulative effect of chronic risk exposures and comorbid conditions that predispose to gastrointestinal bleeding. Similar age distributions have been documented in other Indian and international studies [5].

Clinically, the most frequent presentation was combined hematemesis and melena, indicating active and significant bleeding. This is in line with the observations of Hearnshaw et al., who reported similar presentation patterns in acute UGI bleeding cases [1]. The high prevalence of pallor (71.8%) in the present study reflects the degree of blood loss and delayed presentation, which is often seen in resource-limited settings. The presence of shock in approximately one-fifth of patients underscores the severity of the condition at admission and highlights the need for prompt resuscitation and intervention.

In the present study, alcohol consumption (45.9%) and chronic liver disease (40%) were major risk factors, which aligns with the known epidemiological trends in developing countries, particularly in India [6,7]. Alcohol-induced liver disease remains a significant contributor to portal hypertension and variceal formation, thereby increasing the risk of bleeding. NSAID use was also identified in a considerable proportion of patients (24.7%), supporting its established role in mucosal injury and peptic ulcer-related bleeding [4].

Endoscopic findings revealed that esophageal varices were the most common etiology (42.4%), followed by peptic ulcer disease (32.9%). This pattern is consistent with studies conducted in India and other parts of Asia, where variceal bleeding predominates due to the high burden of chronic liver disease [6,7]. In contrast, Western literature reports peptic ulcer disease as the leading cause of UGI bleeding, reflecting differences in risk factor profiles and healthcare access [2,5]. The proportion of erosive gastritis and Mallory-Weiss tears in the present study was comparable to previous reports, indicating their relatively lower but clinically relevant contribution to UGI bleeding [3].

A key finding of this study was the statistically significant association between chronic liver disease and variceal bleeding ($p < 0.001$), which reinforces the pathophysiological link between portal hypertension and variceal rupture. This finding is supported by existing literature and emphasizes the importance of early identification and management of chronic liver disease to prevent life-threatening complications [7]. It also highlights the need for screening endoscopy in high-risk patients.

From a clinical and public health perspective, the findings underscore the importance of early diagnosis, risk factor modification, and timely endoscopic intervention in reducing morbidity and mortality associated with UGI bleeding. Preventive strategies such as rational use of NSAIDs, alcohol cessation programs, and management of chronic liver disease can significantly reduce the burden of disease. Furthermore, strengthening emergency care services and endoscopic facilities in tertiary centers is crucial for improving patient outcomes.

The strengths of the present study include its prospective data collection, use of endoscopic confirmation for etiological diagnosis, and inclusion of a well-defined patient population. However, certain limitations must be acknowledged. The study was conducted in a single tertiary care center, which may limit the generalizability of the findings. The relatively small sample size and short study duration may not fully capture seasonal or long-term variations in disease patterns. Additionally, long-term outcomes such as rebleeding and mortality were not assessed.

Overall, the study provides valuable insights into the clinical and etiological spectrum of UGI bleeding in a North Indian tertiary care setting and highlights the need for targeted preventive and management strategies.

CONCLUSION

Upper gastrointestinal bleeding remains a significant medical emergency with considerable morbidity in tertiary care settings. The present study demonstrated that middle-aged males constituted the majority of affected patients, with combined hematemesis and melena being the most common clinical presentation. Esophageal varices emerged as the leading cause, followed by peptic ulcer disease, reflecting the high burden of chronic liver disease and alcohol use in the study population. The strong association between chronic liver disease and variceal bleeding highlights the need for early

identification and management of liver disorders. Preventive strategies such as alcohol cessation, judicious use of NSAIDs, and timely screening for portal hypertension can play a crucial role in reducing disease burden. Strengthening endoscopic services and ensuring early intervention are essential to improve patient outcomes. Further multicentric studies with larger sample sizes and long-term follow-up are recommended to better understand trends and outcomes of upper gastrointestinal bleeding in diverse populations.

DECLARATIONS

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Conflict of Interest: The authors declare no conflict of interest.

Consent: Written informed consent was obtained from all participants prior to inclusion in the study.

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