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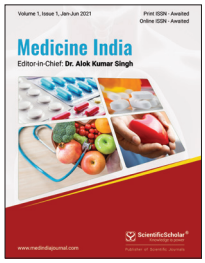

Original Article

Etiology, risk factors, and endoscopic profile in patients presenting with upper gastrointestinal bleeding – An observational study

Jnanaprakash B. Karanth[1], Vivek Hande[2], Kiran Maribashetti[2], Vijaykumar Barude[3]

[1]Department of General Medicine, Shripad Hegde Kadave Institute of Medical Sciences, [2]Department of Medicine, Indian Naval Hospital Ship Asvini, Mumbai, [3]Department of General Surgery, Shripad Hegde Kadave Institute of Medical Sciences, Sirsi, Karnataka, India.

***Corresponding author:**
Jnanaprakash B. Karanth, Department of General Medicine, Shripad Hegde Kadave Institute of Medical Sciences, Sirsi, Karnataka, India.

jbkaranth@gmail.com

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ABSTRACT

Objectives: Upper gastrointestinal bleeding (UGIB) poses a strong diagnostic and therapeutic challenge to emergency physicians and gastroenterologists. There are wide variations in the etiological profile of UGIB, and it often varies with the demography of the patient clientele. A thorough understanding of these changing patterns of the etiological profile, characteristics of the affected patients, and treatment outcomes in the wake of constantly evolving diagnostic and therapeutic protocols are vital for healthcare providers. The aim is to study the clinical profile and assess possible risk factors and endoscopic findings among the patients presenting with UGIB at two different centers: Armed Forces Tertiary Care Teaching Hospital and Civil Tertiary Care Hospital.

Materials and Methods: This is a cross-sectional observational study conducted at two centers: A tertiary care hospital of the armed forces (n = 113) from September 2015 to January 2018 and a civil tertiary care center in a tier 3 city (n = 178) from January 2019 to November 2021. The study population comprised patients presenting with UGIB. All patients diagnosed with UGIB and confirmed by endoscopy were enrolled in the study.

Results: The study included patients presenting with UGIB visiting either of the two tertiary care centers. The majority of the study population (75%) was male. Between the two clinical settings, alcohol consumption was higher in proportion in the army tertiary care than those visiting the civil tertiary care. Relatively, a history of UGIB (35%), acid peptic disease (23%), and cirrhosis of the liver (35%) was high among the armed forces tertiary care patients. Among the patients visiting a tier 3 civil hospital, more than two-thirds were diagnosed with gastritis (66.67%) and carcinoma of the esophagus (17%).

Conclusion: The etiology of UGIB varies with different clinical care settings. The risk factors are majorly driven by sociocultural factors, respectively.

Keywords: Upper gastrointestinal bleed (UGIB), Cirrhosis, Acid peptic disease (APD), Portal hypertensive gastropathy (PHG)

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is one of the most commonly encountered clinical manifestations by health-care practitioners at various levels and contributes to significant morbidity and mortality worldwide. UGIB is bleeding from the gastrointestinal tract proximal to the ligament of Trietz.[1-3]

Patients usually present with hematemesis or melena as chief complaints. When severe massive UGIB occurs (in 15% of cases), patients present with hematochezia and have a poor

prognosis.[4] Patients with occult gastrointestinal bleeding may present with symptoms of blood loss or anemia such as light-headedness, syncope, easy fatigability, dyspnea, weight loss, or positive fecal occult test.

The common causes of UGIB include peptic ulcer disease (most common cause, 50% of UGIB), esophageal or gastric varices, Mallory–Weiss tear, erosive gastritis, or duodenitis. Malignancy, angiodysplasia, Dieulafoy's lesions, etc., also contribute to the significant proportion of UGIB.[5] Portal hypertension, a serious complication of cirrhosis, is associated with esophageal varices, gastric varices, portal hypertensive gastropathy (PHG), and rarely ectopic varices, and is another noble cause of UGIB.[6] Variceal bleeding is reported to account for 10–40% of UGIB, depending on the population. Bleeding from gastric varices is usually associated with a remarkably high mortality rate.[7]

Many studies have reported a change in the relative contribution of the conditions. Kim *et al.*, in their recent study from a tertiary care hospital in India, reported a changing etiological profile of upper gastrointestinal bleed.

Table 1: Demographic profile of the study population.

Baseline parameters	Armed Forces Tertiary Care Center	Tertiary care center from a tier 3 city
n	113	178
Gender, *n* (%)		
Male	91 (80.53)	95 (53.4)
Female	22 (19.47)	83 (46.6)
Age, in years		
Mean±SD	50.7±17.3	49.9±17.3
Min	13	16
Max	88	95
95% CI	47.45–53.89	45.3–52.4
Working status, *n* (%)		
Retired	39 (33.51)	15 (8.4)
Currently working	37 (32.74)	40 (51.3)
Homemakers	12 (10.62)	58 (32.6)
Farmers	6 (5.31)	40 (22.5)
Business	-	17 (9.6)
Student	-	8 (4.5)
Risk factors		
Alcohol consumption	71 (62.83)	30 (16.9)
Tobacco use	33 (29.20)	40 (22.5)
Past upper gastrointestinal bleeding	36 (31.86)	8 (4.5)
Past acid peptic disease	26 (23)	2 (1.1)
Past cirrhosis of the liver	39 (34.5)	2 (1.1)
Comorbidities		
Coronary artery disease	7 (6.19)	4
Hypertension	6 (5.31)	-
Cerebrovascular accident	3 (2.65)	0
Chronic kidney disease	3 (2.65)	0
Malignancy	5 (4.42)	0
Treatment history with anticoagulants and anti-platelets *n* (%)		
Antiplatelets	13 (11.5)	3
NSAIDs	4 (3.53)	-
Heparin	3 (2.65)	-
Acitrom	1 (0.88)	-
Dabigatran	1 (0.88)	-
Warfarin+Apixaban	1 (0.88)	-
Presenting symptoms		
Hametemsis	84 (74.3)	178 (100)
Melena	59 (52.2)	26 (14.6)
Hematochezia	-	4 (2.2)
Syncope, Presyncope, easy fatigability	4 (3.5)	8 (4.5)
Dyspepsia, epigastric pain diffuse abdominal pain, dysphagia, loss of appetite	92 (81.4)	163 (91.6)

SD: Standard deviation, CI: Class interval, Min: Minimum, Max: Maximum, NSAID: Non-steroidal anti-inflammatory drugs

Compared with the etiological profile of the year 1991, in the year 2013, the contribution of peptic ulcer has reduced from 43% to 34%, and the proportion of bleeding caused by varices remained almost unchanged at 33%. However, the bleeding due to erosive esophagitis has increased from 2% to 8%.[8]

UGIB still poses a strong diagnostic and therapeutic challenge to emergency physicians and gastroenterologists. There are wide variations in the etiological profile of UGIB, and it is constantly changing in recent times. A higher proportion of subjects presenting with advanced age and multiple comorbidities in recent times further complicating the issue. A thorough understanding of these changing patterns of the etiological profile, characteristics of the affected patients, and treatment outcomes in the wake of constantly evolving diagnostic and therapeutic protocols are vital for healthcare providers. Few region-based studies have been conducted in India to assess the etiology and endoscopic profile of patients presenting with UGIB. Considering the need for further studies on the subject, the present study was planned and conducted in tertiary care hospitals in two different settings to document the clinical and endoscopic profiles of UGIB.

MATERIALS AND METHODS

An observational cross-sectional study was conducted at a tertiary care hospital of the Armed Forces from September 2015 to January 2018 (n = 113) and one in a tertiary care center in a tier 3 city from January 2019 to November 2021 (n = 178). The study population comprised patients presenting with UGIB. All patients diagnosed with UGIB and confirmed by endoscopy were enrolled in the study after obtaining informed consent.

All the study subjects were recruited into the study sequentially by convenient sampling. A pro forma was devised for the study and filled separately for each patient. The data and findings of individuals confirmed to have UGIB on endoscopy were collected and entered in the pro forma. The study was straightforward and descriptive; hence, no inferential statistics were done. International Business Machines Corporation Statistical Package for the Social Sciences (IBM SPSS) version 22 was used for statistical analysis.

RESULTS

[Table 1] provides the demographic summary of the included participants. The majority was male. The two major risk factors of UGIB, alcohol consumption, and tobacco usage habits, were observed in more than two-thirds and 30% of the population, respectively.

Among the patients visiting the armed tertiary hospital, the majority were male, and alcohol consumption was significantly higher in proportion than those visiting the civil tertiary care. Relatively, a history of UGIB (35%), acid peptic disease (APD) (23%), and cirrhosis of the liver (35%) was high among the armed forces tertiary care patients composing a higher proportion of retired veterans [Table 1]. The cause of bleeding in patients with APD was gastritis, and for those with cirrhosis, it was esophageal varices or PHG.

Table 2: Descriptive analysis of diagnosis in the study population of two centers.

Diagnosis	Armed Forces Tertiary Care Center n=113	Tertiary care center from a tier 3 city n=178
	n (%)	n (%)
Cirrhosis of the liver (Total)	40 (35.39)	13 (7.47)
Cirrhosis of the liver (Alcohol-related)	26 (23.01)	10 (5.75)
Cirrhosis of the liver (HBV related)	7 (6.19)	1 (0.57)
Cirrhosis of the liver (HCV related)	3 (2.70)	-
Cirrhosis of the liver (Idiopathic)	4 (3.50)	3 (1.72)
Gastritis	29 (25.70)	116 (66.67)
Duodenal ulcer	12 (10.62)	1 (0.57)
OAC/NSAID-induced UGIB	8 (7.07)	3 (1.72)
EHPVO	6 (5.30)	1 (0.57)
Gastric carcinoma	4 (3.50)	14 (8.05)
Gastric ulcer	5 (4.40)	-
Mallory–Weiss tear	4 (3.50)	-
Corrosive injury-related UGIB	1 (0.90)	-
Hepatocellular carcinoma	1 (0.90)	-
Carcinoma esophagus	1 (0.90)	30 (17.24)
Dieulafoy's lesion	1 (0.90)	-
Duodenal ulcer+Gastric ulcer	1 (0.90)	-

HBV: Hepatitis B Virus; HCV: Hepatitis C virus; OAC: Oral anticoagulants; NSAID: Non-steroidal anti-inflammatory drugs; UGIB: Upper gastrointestinal bleeding; EHPVO: Extrahepatic portal vein obstruction

Among the study population, UGIB was severe in 16 patients, and all were visiting the Army tertiary care center.

Cirrhosis of the liver, especially alcohol-related, was high in the army tertiary hospital. Duodenal ulcer (10.6%) and non-steroidal anti-inflammatory drugs (NSAID)-induced UGIB (7%) were relatively more in this group of individuals. In the other group comprising patients visiting a tier 3 city hospital, more than half were diagnosed with gastritis (66.67%), and one-fourth were diagnosed to have carcinoma (gastric carcinoma 8% and carcinoma of the esophagus after 17%) [Table 2].

In the armed forces tertiary care hospital, the duodenal ulcer was seen in 11 (8.94%), and 03 (2.7%) patients each had a duodenal ulcer with gastritis and duodenal ulcer with PHG [Table 3]. Oral anticoagulants/NSAIDs-induced bleeds were seen in 7 (6.2%). Gastric varices and PHG were relatively more prevalent among the armed forces tertiary care center than the civil care center [Table 3].

DISCUSSION

UGIB is a significant public health problem posing a substantial clinical and economic burden. The etiological profile is constantly changing, with the emergence of new risk factors and underlying comorbid conditions. Hence, the relative contribution of the different etiologies in a given setting may constantly change with time and may differ from another setting with a different population structure and lifestyle factors. Hence, systematic studies of the spectrum of clinical presentation, risk factors, etiological profile, and the treatment outcomes of UGIB cases in a given setting may provide vital inputs to guide clinical practice. The present study was conducted in two settings comprising patients visiting either an armed forces tertiary care center or a civil tertiary care center for a tier 3 city. A tertiary care teaching hospital predominantly deals with referred cases from the primary and secondary level health-care facilities in the catchment area.

The previous studies report that UGIB is twice as common among males as females. The present study concurs with this finding, wherein there were 75% of males with UGIB. The ratio was skewed among the individuals visiting the armed forces tertiary care hospital, whereas the other civil tertiary care group comprised almost equal proportions of males and females [Table 1]. Clinically, it is essential to identify the risk factors and predictors of the clinical course. One of the predominant lifestyle factors documented in this study was alcohol consumption. Ibáñez *et al.*[9] observed that a previous history of APD or UGIB increased the risk of UGIB. The odds ratio (OR) was 3.6 (3.0–4.3) in those with a history of peptic ulcer and 13.0 (10.6–16.0) in those with a history of UGIB. Weil *et al.*[10] compared the risk profiles of 1121 patients with gastrointestinal bleeding with 989 community controls. His case–control study revealed that previous peptic ulcer had an OR of 3.8 higher risks for UGIB.

Among the study population, 71 (62.83%) were consuming alcohol. A higher proportion of alcohol users (86.6%) were observed in a population-based study by Gao *et al.*[11] Their case–control study among 1004 cases and 2446 controls

Table 3: Endoscopic profile of the patient population.

UGIE findings	Armed forces tertiary care center *n*=113	Tertiary care center from a tier 3 city *n*=178
	n (%)	*n* (%)
Gastric varices+portal hypertensive gastropathy	37 (23.9)	12 (6.74)
Gastritis	29 (25.7)	116 (65.17)
Duodenal ulcer	11 (8.94)	1 (0.57)
OAC/NSAID-induced bleed	7 (6.2)	3 (1.72)
Gastric carcinoma	4 (3.5)	14 (7.86)
Mallory–Weiss tear	4 (3.5)	-
High-risk esophageal varices	4 (3.5)	1 (0.57)
Gastric ulcer	3 (2.7)	-
Portal hypertensive gastropathy	3 (2.7)	1 (0.57)
Portal hypertensive gastropathy+duodenal ulcer	3 (2.7)	-
Portal hypertensive gastropathy+gastric ulcer	2 (1.8)	-
Low-risk esophageal varices	1 (0.9)	-
Duodenal ulcer+gastric ulcer	1 (0.9)	-
Portal hypertensive gastropathy+gastritis	1 (0.9)	-
Esophageal carcinoma	1 (0.9)	30 (16.85)
Dieulafoy's lesion	1 (0.9)	-
Duodenal ulcer+esophagitis+gastritis	1 (0.9)	-

UGIE: Upper gastrointestinal endoscopy; OAC: Oral anticoagulants; NSAID: Non-steroidal anti-inflammatory drugs

found that alcohol consumption increases the risk of major gastric and duodenal bleeding in non-predisposed individuals. Evidence suggests that the gastrointestinal effects of chronic long-term alcohol abuse are related to chronic atrophic gastritis and cirrhosis of the liver. Our study revealed that 26 (23.01%) had alcohol-related cirrhosis.

Among the patients visiting the armed forces tertiary care center, the most specific diagnosis in our study was cirrhosis of the liver, 40 (35.39%) out of which 26 (65%) was cirrhosis of the liver (Alcohol-related). Most patients enrolled in the study from the Armed Forces tertiary care center had relatively easy access to alcohol. This correlates with the increased incidence of alcohol-related cirrhosis in this patient population relative to the civil tertiary care center group. Another recent study has observed alcohol consumption in about 50% of the patients with UGIB caused by variceal bleeding. The recognized common causes of liver fibrosis and cirrhosis include hepatitis B, hepatitis C, and alcohol consumption. Changing patterns of alcohol consumption in the West, as well as East and the increasing rates of obesity and diabetes, mean that advances in preventing and treating viral hepatitis may be offset by an increasing burden of fibrosis and cirrhosis related to alcohol and non-alcoholic steatohepatitis.[12]

In our study, gastritis was responsible for UGIB in 67% of the patients visiting civil tertiary care centers compared to about one-fourth (25.7%) of the cases of UGIB in the armed forces tertiary care. In the study population, the total number of patients with cirrhosis is 53, and gastritis is 145. The combined results indicate that gastritis or APD is the most common etiology of UGIB. Lifestyle modifications increased mental stress and increased over-the-counter intake of painkillers or NSAIDs have all contributed to the increased incidence of Gastritis. As per the recent update by Jafar *et al.*,[13] gastritis and erosion constitute 16% of cases in the UK and are one of the leading causes of non-variceal UGIB, closely following gastric ulcer. However, like the present study, Rathod *et al.*[14] have reported gastritis to be responsible for 34% of UGIB cases.[15,16] Hospital-based observational studies in the Indian population reported peptic ulcer as the most common cause associated with acute UGIB. Few studies have also reported esophageal varices as the common cause of UGIB.[17]

The use of NSAIDs, particularly for the long term, significantly impacts the risk of UGIB. Cheatum *et al.*[18] assessed risk factors associated with NSAID usage in patients with gastrointestinal symptoms. The study observed a prior history of peptic ulcer, increasing age, and extended duration of NSAID use as major contributing factors.

Overall, our study findings indicate that prevalence estimates of UGIB and the associated complications and risk factors could vary with different settings and diverse socio-cultural factors.

Our study was conducted in a tertiary care hospital where cases were referred to us and, hence, may not truly reflect the general population in an absolute context. However, the inclusion of tertiary care centers from two different settings with a skewed higher male-to-female ratio in the armed forces tertiary care relative to an almost equal gender distribution of the population from a tier 3 city care center increases the reliability of the results.

UGIB remains a commonly encountered manifestation in the emergency department. Effective tailored management of the patient with acute UGIB requires an organized, well-planned strategy that includes early hemodynamic resuscitation and stabilization, pre-endoscopic risk stratification using validated pharmacologic or endoscopic intervention, and post-endoscopy therapy.

CONCLUSION

The most common etiology for UGIB was liver cirrhosis, majorly alcohol-related in the army tertiary care setting, and gastritis in the civil tertiary care setting. The most common predisposing factor for bleeding was antiplatelet medication use and a history of UGIB, and the most common risk factor was alcohol consumption. We record a changing trend in the etiology of UGIB with different care settings. The risk factors and prevalence estimates vary with different socio-cultural factors. However, there is a need to conduct large-scale prospective studies and meticulously designed randomized controlled trials in different settings to enhance our understanding of the constantly changing etiological profile, a clinical manifestation with endoscopy findings in patients with UGIB.

Author contributions

The work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Ethical approval

The authors declare that they have taken ethical approval from IRB/IEC.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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