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Original Article

# Clinical and endoscopic profile of patients with upper gastrointestinal bleeding at tertiary care center of North India

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## Abstract

**Background:** Upper gastrointestinal bleeding (UGIB) is a common medical emergency associated with significant morbidity and mortality. The presentation of bleeding depends on the amount and location of hemorrhage and the endoscopic profile varies according to different etiology. Despite advancements in medical intervention UGIB still carries considerable morbidity, mortality and economic burden on health care system. At present, there is limited epidemiological data on UGIB and associated mortality from India. **Aims:** The aim was to study clinical, endoscopic profile, and associated mortality in patients presenting with UGIB. **Materials and Methods:** One hundred and fourteen patients came to Emergency Department with UGIB during the study period and were subjected to endoscopy to identify the etiology. The clinical and endoscopic profile was analyzed and mortality pattern was studied. **Results:** The mean age of patients was 49 ± 14.26. Majority of them were males (83.33%) and male to female ratio was 5:1. The most common cause of UGIB was portal hypertension related (Esophageal and gastric varices) seen in 56.14% of patients, peptic ulcer-related bleed was seen in 14.91% patients, gastric erosions were responsible for bleed in 12.28% patients, Mallory–Weiss tear was seen in 8.77% cases, gastric malignancy accounted for 4.38% of cases, Dieulafoy's lesion was responsible for bleed in 1.75% cases and 1.75% had Duodenal polyp. The mortality rate because of UGIB in our cohort of patients was 21.05%. **Conclusions:** In the present study, variceal bleed was the most common cause of UGIB, followed by peptic ulcer bleed. Overall mortality was seen in 21.05% of cases; however, majority of mortality was seen in portal hypertension related bleeding.

**Key words** Child-turcotte-pugh, international normalized ratio, mortality, portal hypertension, upper gastrointestinal bleeding

## Introduction

Upper gastrointestinal bleeding (UGIB) is a common gastrointestinal (GI) emergency presenting as hematemesis and/or melena and rarely as hematochezia and is associated with significant morbidity and mortality.[1] The incidence of UGIB varies between 40 and 150/100,000 population and increases appreciably with age. More than 350,000 patients are hospitalized each year in the United States for UGIB[2] and mortality rates of 5% to 11% have been reported representing a serious and life-threatening entity.[3] There are many causes for upper GI hemorrhage. Patients can be stratified as having either variceal or nonvariceal sources of upper GI hemorrhage as the two have different treatment algorithms and prognosis.[4] The primary diagnostic test for evaluation of UGIB is endoscopy. Early endoscopy and endoscopic appearance of certain lesions helps to guide care and thereby reduce the costs and duration

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of hospitalization.[5] At present, there is a paucity of data on clinical and endoscopic profile of patients of UGIB and their risk factors for mortality from India and particularly from this region. Therefore, this study was planned with an aim to identify clinical and endoscopic profile of patients with UGIB coming to Emergency Department of our hospital and to study the factors associated with mortality in this group of patients.

## Materials and Methods

This prospective study consisted of the clinical and endoscopic data obtained from consecutive patients with UGIB coming to emergency department of Himalayan Institute of Medical Sciences, Dehradun over a period of 1-year (January 2011–December 2012). Study was conducted after the research protocol was approved by the institute's research committee. Patients were included in the study only after obtaining written informed consent, The data analyzed included the detail history of GI bleeding (hematemesis, melena, hematochezia), risk factors for liver disease including alcoholism and history for intake of anti-platelet agents or non-steroidal anti-inflammatory drugs use and presence of co-morbid conditions such as diabetes mellitus, coronary artery disease, renal failure, etc., All patients underwent thorough physical examination, routine blood and radiological investigations and hemodynamic stabilization with intravenous fluids and blood and blood products, including fresh frozen plasma and platelet concentrates. Patients with past history of chronic liver disease or clinical suspicion of liver disease were started on intravenous vasoconstrictor therapy in the form of Octreotide bolus (100 μg), followed by infusion at 50 μg/h rate. All patients of UGIB were started on intravenous proton pump inhibitors infusion in an emergency department. Patients were subjected to upper GI endoscopy as soon as possible after hemodynamic stabilization and endoscopy were done in the majority of patients within 24 h of admission. During endoscopy, band ligation was done for bleeding large esophageal varices, and N-butyl cyanoacrylate glue was injected in bleeding gastric varices. For bleeding peptic ulcer, diluted adrenaline injection was injected around the ulcer base.

Collected data were analyzed using statistical methods such as mean, standard deviation (SD), per value, Chi-square test. The results were displayed in tables with categorical variables presented as numbers and percentages, and the continuous variables presented as mean ± SD. The data were analyzed using SPSS Version 22. $P < 0.05$ was considered significant.

## Results

The study population comprised of 114 patients of UGIB who came to hospital emergency in a given study period. The mean age in the study population was 49 ± 14.26 year's and male to female ratio was 5:1. Epidemiological and clinical profile of patients has been shown in Table 1.

In this study, portal hypertension leading to the development of esophageal and/or gastric varices was observed as the most common cause of UGIB (56.14%). In the present study, 54 patients underwent endoscopic variceal band ligation of esophageal varices four patients were injected cyano-acrylate glue into the fundal varix. Peptic ulcer related bleed was the second most common cause of UGIB in our study group (1.91%). Out of the total of 17 patients with ulcer related bleed, only 8 Patients required endotherapy with adrenaline injection. One patient with ulcer bleed required surgical intervention. The endoscopic diagnosis of UGIB cases has been shown in Table 2.

In the present study, 24 patients expired with mortality rate of 21.05% and the factors significantly associated with mortality were presence of co-morbidities (diabetes mellitus, hypertension, ischemic heart disease, chronic renal failure), systolic blood pressure <100 mm Hg, hemoglobin <10 g%, requirement of more than 2 units of packed red blood cell transfusion, international normalized ratio (INR) >1.6, serum creatinine >2.0 mg%, and re-bleeding during same admission as shown in Table 3. There was no significant association seen with increasing age of patients ($P = 0.94$) [Table 4], sex ($P = 1.0$) and platelet counts ($P = 0.66$).

## Discussion

Despite advances in diagnosis and therapy, the mortality of GI bleeding has remained relatively constant at about 10% during

**Table 1: Epidemiological and clinical features of patients presenting with upper gastrointestinal bleeding**

| | Number of patients | Percentage |
|---|---|---|
| Male patients | 95 | 83.3 |
| Female patients | 19 | 16.6 |
| Alcohol intake | 61 | 53.5 |
| NSAIDs* intake | 22 | 19.29 |
| Aspirin usage | 10 | 8.77 |
| Alcohol+NSAIDs* | 6 | 5.26 |
| Hematemesis | 31 | 27.19 |
| Melena | 14 | 12.28 |
| Hematochezia | 1 | 0.87 |
| Heamtemesis+melena | 68 | 59.64 |

*NSAIDS=Nonsteroidal anti-inflammatory drugs

**Table 2: Endoscopic diagnosis of patients with upper gastrointestinal bleeding**

| Final diagnosis | Total (%) |
|---|---|
| Portal hypertension related esophageal and gastric fundal varices | 64 (56.14) |
| Gastric and duodenal ulcer | 17 (14.91) |
| Gastric erosions/gastritis | 14 (12.28) |
| Mallory-Weiss tear | 10 (8.77) |
| Gastric malignancy | 5 (4.38) |
| Dieulafoy's lesion | 2 (1.75) |
| Duodenal polyp | 2 (1.75) |

the past half century. With a longer life expectancy, more GI bleeders are elderly and with co-morbid conditions, which contribute to the high mortality from GI bleeding. Prognostic indicators of GI bleeding offer the potential of predicting major adverse events in GI bleed, that is, re-bleeding and mortality.

Our study is aimed at understanding the clinical and endoscopic profile of patients and mortality patterns in patients who present to the emergency department with acute UGIB.

The mean age of the study population in our study group was 49 years. Previously done studies from India have shown similar age profile of the patients. In a study done by Rathi *et al*. the mean age of patients presenting with UGIB was 42 years.[6] In another study by Lakhwani *et al*. in 2000, mean age of patients were 51.9 years.[7]

Studies done in the past have shown an increase in mortality with advancing age of the patients with worse outcome noticed in the geriatric population. In a study done by Lakhwani *et al*.,[7] UGIB was more common in the older age group of 60 years. In the present study, we could show an increase in mortality with an increase in patient age however; we could not demonstrate statistically significant difference with an increase in age [Table 4]. This limitation could be explained due to overall small sample size ($n$ = 114) with patients more than 60 years of age only 22 in number (19% of total sample size) and limited duration of data collection (1-year period) in the study period.

Among 114 patients in our study, UGIB was found to be more common in men (83.33%) as compared to women (16.66%). However, there is statistically no significant relationship found between gender and outcome ($P$ = 1.000). In a study done by Singh *et al*. from costal Odisha from India it was found that UGIB is more common in males than females 6:1.[8] In another Indian study by Shenoy and Rao,[9] UGIB was seen in 74.2% males and 25.8% females and another study of 111 patients by Kashyap *et al*. 78.4% patients were males.[10]

**Table 3: Factors associated with increased mortality in the study group**

| Factors associated with mortality | *n* (%) | | *P* |
|---|---|---|---|
| | Present | Mortality | |
| Co-morbidities* | 37 (32.45) | 22 (19.29) | <0.01 |
| SBP <100 mmHg | 35 (30.7) | 23 (20.17) | 0.00 |
| Haemoglobin <10.0 g% | 83 (72.8) | 24 (21.0) | 0.00 |
| Blood transfusion >2.0 units | 72 (63.15) | 24 (21.05) | 0.01 |
| INR >1.6 | 29 (25.43) | 21 (18.42) | 0.01 |
| Serum creatinine >2.0 mg% | 25 (21.92) | 23 (20.17) | 0.001 |
| Presence of re-bleeding during admission | 25 (21.92) | 23 (20.17) | 0.001 |

*Co-morbidities included diabetes mellitus, hypertension, ischemic heart disease, chronic renal failure. SBP=Systolic blood pressure, INR=International normalized ratio

**Table 4: Relationship between age and outcome (*n*=114)**

| Age group | Discharge (%) | Expired (%) | Total (%) |
|---|---|---|---|
| 20-40 | 27 (79.41) | 7 (20.58) | 34 (29.82) |
| 41-60 | 45 (77.58) | 13 (22.41) | 58 (50.87) |
| >60 | 18 (81.81) | 4 (18.19) | 22 (19.29) |

Chi-square=0.18, $P$=0.914

In the present study, 31 (27.19%) patients presented with hematemesis, 14 (12.28%) patients presented with isolated melena, 1 (0.87%) patient presented with hematochezia and 68 (59.64%) patients presented with complaints of hematemesis and melena. In a similar Indian study melena was the presenting complaint in 95.06% and hematemesis was present in 43.09%. Both hematemesis and melena were seen in 41.78%.[8] In a study done by Bambha *et al*., 19% patients presented with complaints of melena, 28% patients presented with hematemesis and 52% patients presented with both hematemesis and melena.[11]

Etiological spectrum of UGIB has been variable in the studies from India with some studies showing variceal bleeding as the most common cause of UGIB while other studies showing peptic ulcer disease as the most common cause of UGIB. In the present study, 56.14% patients had portal HTN related esophageal and fundal varices, 14.91% had gastric and duodenal ulcer, 12.28% had gastric erosions/gastritis, 8.77% had Mallory–Weis tear, 4.38% had gastric malignancy, 1.75% had Dieulafoy's lesion and 1.75% had duodenal polyp. In contrast, in a recent study from eastern India in 2013, the endoscopic diagnosis was duodenal ulcer in 57.6% patients, variceal bleed in 12.8% patients, gastric ulcer in 1.8% patients, Mallory–Weiss tear in 1.8% patients, erosive gastritis in 1.8% patients and malignancy comprised of 7.7% of cases.[8] In another study done by Anand *et al*. from North India, causes of bleeding were esophageal varices in 45.5%, duodenal ulcer in 25%, gastric ulcer in 5% and gastritis in 8.5%.[12] Study done by Dilawari *et al*. found variceal bleeding due to portal hypertension (36%) as the most frequent cause followed by peptic ulceration (24%) and gastric erosions (19%).[13] In our study, we had more than half of patients with portal hypertension related bleed secondary to cirrhosis of the liver, which are sicker than patients with other causes of GI bleed. Ours being a tertiary referral center, many of these sick patients are referred to our center for evaluation and management therefore higher percentage of variceal bleed may be a referral bias in this study.

The mortality of UGIB is higher in patients who have co-morbid illnesses, and this effect is typically large in magnitude and highly statistically significant. In our study, it was found that there was a statistically significant relation between co-morbidities (type 2 diabetes mellitus, CAD, renal failure etc.) and clinical outcome of the patients ($P$ = 0.001). In our study, 32.45% patients had associated co-morbidities. Similar results were seen in studies done by Rockall TA

for the National Audit of acute upper GI hemorrhage in United Kingdom where co-morbidities have been described as a significant risk factor for mortality.[5] Gado *et al*. in their study from Egypt reported a mortality of 20.89% in patients who had associated major co-morbidity.[14]

The initial vital signs are the most important parameters in the physical examination. In this study, patients who presented with a systolic blood pressure of <100 mmHg had a higher mortality (65.71%) when compared to those whose blood pressure was >100 mmHg at the time of hospital admission (1.40%). These results were similar which are seen in a prospective study conducted as a part of national audit of management and outcome of acute upper GI hemorrhage where shock has been described as a significant independent risk factor for mortality.[5]

The hemoglobin levels are generally believed to be prognostically insignificant. There was statistically significant relationship seen between hemoglobin at the time of presentation and clinical outcome ($P$ = 0.000). In a study done by Chaikitamnuaychok and Patumanond,[15] mortality increased with lower presenting hemoglobin levels. The hemoglobin level when followed over time is a useful indicator of the severity of bleeding.

In the present study, there was a highly statistically significant relationship seen between INR and final outcome of patients ($P$ = 0.001). In a study done by Shingina *et al*., it was shown that the presenting INR does not predict re-bleeding among nonvariceal UGIB patients. However, an INR ≥ 1.5 is an independent predictor of mortality that needs to be taken into consideration as part of initial risk stratification.[16] In another study by Cook *et al*. they found with increase coagulopathy there is an increased risk of bleeding and mortality (odds ratio = 4.3, $P \leq 0.001$).[17]

The relationship of serum creatinine level to mortality was found to be statistically significant ($P$ = 0.001) in this study. In a study by Chaikitamnuaychok and Patumanond the severity of UGIB increases with impaired renal function,[15] In a study done by Ismail, serum creatinine (2.1 vs. 1.1 mg/dl) level were higher among nonsurvivors than among survivors. Serum creatinine level exceeding 1.5 mg/dl was more common in nonsurvivors (13/30 (43%) than in survivors (38/313 (12%); $P$ = 0.027).[18]

The risk of re-bleeding is a critical parameter in determining the outcome of patients presenting with UGIB. In a study done by Thomopoulos *et al*. noted re-bleeding occurred in 10.7% of the patients.[19] In another study, it was found that re-bleeding was an important predictor of adverse outcome.[20]

The number of units of packed erythrocytes transfused is the most frequently cited nonendoscopic predictor of persistent and recurrent bleeding. The relationship between the number of blood transfusions and outcome of the patients was found to be statistically significant ($P$ = 0.013). In a study done by Jeffery it is found that the outcome of transfused patients was significantly worse than that of nontransfused patients.[4] In a study done by Schiller *et al*. patients given a transfusion of not more than 4 bottles had a low fatality rate which was similar to that of those who were not transfused. Patients receiving 5–10 bottles of blood had double this fatality rate.[21] In a study done by Bambha *et al*. they found patients who required more blood transfusions had worse outcome ($P \leq 0.001$).[11]

Overall mortality was seen in 24 patients (21% patients out of total of 114), out of which 19 patients expired in portal hypertension group (16.6%), three patients in acid peptic group (2.63%) and two patients with gastric malignancy (1.75%). In a study by Chalasani *et al*.[22] a total of 231 subjects were included, and their in-hospital, 6-week, and overall mortality rates were 14.2%, 17.5%, and 33.5%, respectively. Similarly, Carbonell *et al*.[23] reviewed the clinical records of all patients with cirrhosis due to variceal bleeding during the years 1980, 1985, 1990, 1995, and 2000. The in-hospital mortality rate steadily decreased over the study period: 42.6%, 29.9%, 25%, 16.2%, and 14.5% in 1980, 1985, 1990, 1995, and 2000, respectively ($P$ < 0.05).

To our knowledge, this is the first study on UGIB from this region; however, this study has its own limitation. This study had small sample size and was conducted in limited time frame of 1-year only.

## Conclusion

In this study, portal HTN related esophageal and fundal varices (56.14%) were the most common cause of UGIB followed by peptic ulcer-related bleed (14.91%). Mortality because of UGIB was seen in 21.05%. The factors associated with increased mortality in our study were: Hypotension, underlying co-morbidities, prolonged INR, elevated serum creatinine level, re-bleeding during the hospital stay and hemoglobin of <10 g%.

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