

## Significance of Adequate Upper Gastrointestinal Bleeding Management Planning on Healthcare Outcomes: A Review of Current Literature

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### ABSTRACT

**Background:** Gastrointestinal bleeding is a frequent medical emergency with a steady 10% mortality rate for 20 years. Upper gastrointestinal bleeding is an increasing global health issue requiring quick evaluation, resuscitation, coagulation correction, and interventions.

**Objectives:** The study aimed to evaluate if a comprehensive approach involving quick evaluation, resuscitation, coagulation correction, and timely diagnostic or therapeutic intervention can improve outcomes of upper gastrointestinal bleeding patients.

**Patients and Methods:** The retrospective analysis examined hospital records of 224 patients with upper gastrointestinal bleeding proximal to the Treitz ligament admitted to Al-Jalla Hospital from January to December 2021. The study collected clinical presentation, investigation, and outcome data through a specialized form.

**Results:** The study analyzed 224 patients with upper gastrointestinal bleeding, with 65% male preponderance and almost half being over 60 years old. The majority (79.5%) were admitted to general surgical wards, and melena was the most common symptom (72%). Endoscopic findings revealed duodenal ulcer, gastric ulcer, and erosive gastritis in 21% of cases each, and erosive esophagitis in 9%. The mortality rate was 16%, with higher rates observed in patients over 60 years.

**Conclusion:** The study found a mortality rate of 16% in the patient population, indicating a need for more resources and a more comprehensive approach to patient management.

**Keywords:** Emergency admission, Endoscopy, Hematemesis, Melaena. GI bleeding.

### INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a medical emergency requiring fluid replacement and blood transfusion. Endoscopy should be performed within 24 hours, and bleeding can be stopped using various techniques<sup>(1)</sup>. Gastrointestinal bleeding can occur anywhere along the gastrointestinal tract and is classified as upper or lower depending on its origin. UGIB refers to bleeding from the esophagus, stomach, or duodenum, which can be accessed with a standard fiberoptic endoscope. This type of hemorrhage is subclassified as non-variceal (89%) or variceal (associated with liver disease) (11%). Mortality rates for UGIB have remained unchanged since the 1990s<sup>(1, 2)</sup>, at approximately 10%. Lower gastrointestinal bleeding (LGIB), on the other hand, occurs distal to the ligament of Treitz and includes bleeding of jejunal, ileal, colonic, rectal, or anal origin. Although less common than UGIB, in-hospital mortality rates for LGIB can be as high as 3.4%. While classifying hemorrhage as upper or lower gastrointestinal can aid in diagnosis and management, guidelines recommend that both groups be regarded as one clinical entity for the delivery of care and structured accordingly<sup>(3)</sup>.

Massive UGIB can be defined as the transfusion of at least four units of packed red blood cells, or as the loss of one blood volume in 24 hours, 50% of total blood volume within 3 hours, or blood loss of more than 150 ml/minute, according to the NHS transfusion service in

the UK<sup>(4)</sup>. Clinical aids include a systolic blood pressure of less than 90 mmHg or a heart rate of more than 110 beats per minute<sup>(4, 5)</sup>. Recent landmark UK publications on the topic include the 2015 NCEPOD Massive GI Haemorrhage Report and the 2018 UK Lower GI Bleeding Collaborative audit<sup>(1, 2, 6)</sup>. Comorbidities and lack of fitness for treatment are significant contributors to the risk of mortality following severe UGIB, as reported by NCEPOD<sup>(1, 6)</sup>.

In Western nations, UGIB has an annual incidence of approximately 100 cases per 100,000 people and is four times more common than LGIB. Despite the high incidence, more than 75% of UGIB cases are resolved with supportive treatments. Symptoms may include abdominal pain, lightheadedness, dizziness, syncope, hematemesis, and melena. Gastroenterologists, surgeons, and interventional radiologists may collaborate in the treatment of UGIB cases that require further intervention<sup>(7, 8)</sup>.

UGIB is characterized by symptoms such as melena or hematemesis. Misdiagnosis of LGIB is common when brisk upper GI bleeding presents with hematochezia. Conversely, patients with bleeding from the caecum or distal small bowel may present with melaena<sup>(7, 34)</sup>. Mortality rates have remained constant despite advancements in endoscopic and minimally invasive treatments<sup>(9)</sup>. A full gastrointestinal examination is necessary to localize the source of bleeding and identify

signs of chronic liver disease or malignancy. A digital rectal examination and proctoscopy may be performed to assess melena versus hematochezia.

The most common causes of UGIB are erosive gastroduodenitis, ulcers, esophagitis, varices, Mallory-Weiss syndrome, and tumors. Urgent endoscopy is recommended when a patient has symptoms such as haematemesis, melena, or a postural shift in blood pressure <sup>(10)</sup>. Patients taking NSAIDs, oral steroids, or undergoing radiotherapy should be evaluated for possible medication-induced ulceration. In the UK, up to a third of GIB cases are associated with antiplatelet drugs <sup>(1)</sup>. Published data confirms successful therapy for UGIB when carried out by a skilled endoscopist using one of four techniques: injection of epinephrine or sclerosants, beater-probe coagulation, bipolar electrode coagulation, or laser photocoagulation. Primary surgical surgery is an alternative to urgent endoscopy in patients with abdominal disasters, such as a perforated ulcer or gastric outlet obstruction <sup>(11)</sup>. The study aimed to investigate clinical features, underlying causes, and the future outlook of UGIB patients at Al-Jalla Hospital. Prompt evaluation of patients following national guidelines was crucial for confirming the diagnosis and addressing blood loss concerns, particularly in hospitalized patients with higher mortality risks. Healthcare staff should quickly identify and respond to any signs of UGIB raised by nursing staff.

**PATIENTS AND METHODS**

To gather comprehensive data on various aspects of patients with UGIB, a specialized form was utilized. This form facilitated the collection of pertinent information regarding the clinical presentation, investigations, management, interventions, and outcomes, including morbidity and mortality. In addition, patient registration variables, including age, gender, length of hospital stay, method of referral, and the hospital department of receipt, were included to provide a more in-depth understanding of the patient population. Common presenting abnormalities, such as melena, hematemesis, hematochezia, or syncopal attacks, were also recorded. The patient's medical history, previous monitoring, management, and treatments, as well as prior hospitalization, were considered to gain insight into the patient's overall health status. The study also aimed to evaluate the current patient management procedure and outcomes at Al-Jalla Hospital to identify any potential areas for improvement.

**1. Statistical Analysis:** The study aimed to compare the management and outcomes of the patient population under investigation with existing literature using a pre-established format. Descriptive statistical methods summarize the characteristics of the study population, such as

tables, which are presenting precise numerical data, and bar charts, which are presenting categorical data.

**2. Ethical approval statement:** The data were collected retrospectively from the patient file record at the Medical Registry Department after obtaining the approval of the Al-Jalla Hospital Administration and obtaining permission to collect these data.

**RESULTS**

In this study, 224 patients were analyzed, and their demographic characteristics are presented in (Table 1). Of the total patients, 145 were males (65%) and 79 were females (35%). Nearly half of the patients, 109 (48.7%), were over 60 years old, while 85 (38%) were between 20 and 60 years old, and 30 (14%) were under 20 years old. The average length of hospital stay was five days, ranging from one to 26 days. Majority of patients (79.5%) were admitted to general surgical wards, while 20.5% were admitted to the ICU primarily due to persistent bleeding, hemodynamic instability, and perfusion.

**Table (1):** Demographic characteristics of the studied group

Item	Study group (n=224)	Male 145 (65%)	Female 79 (35%)
<b>Age group</b>			
<20	30 (13.4%)	21(14.5%)	9 (11.4%)
20-60	85 (37.9%)	53 (36.6%)	32 (40.5%)
>60	109 (48.7%)	71 (48.9%)	38 (48.1%)
<b>Admission</b>			
ICU	46 (20.5%)	21 (14.5%)	25 (31.6%)
G.S ward	178 (79.5%)	124 (85.5%)	54 (68.4%)

**Table (2)** showed similar age group distributions and gender admission rates. More female patients were admitted to the ICU (31.6%) compared to males (14.5%).

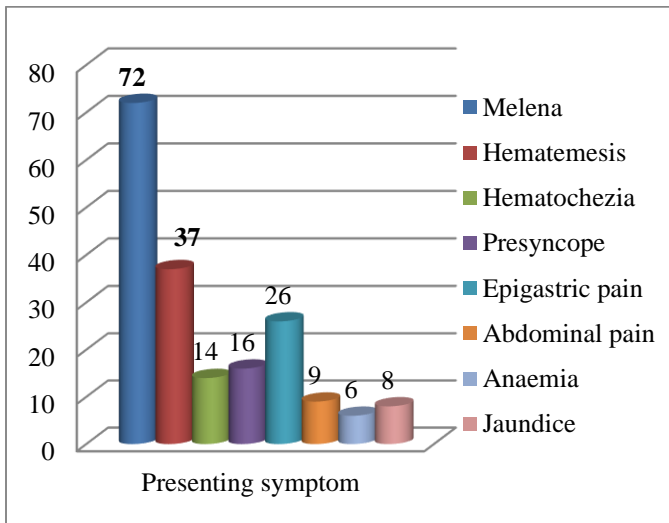
**Table (2):** Age group distribution and admission about gender in the studied group

Item	Male (n=145)	Female (n=79)
<b>Age group</b>		
<20	21(14.5%)	9 (11.4%)
20-60	53 (36.6%)	32 (40.5%)
>60	71 (48.9%)	38 (48.1%)
<b>Admission</b>		
ICU	21 (14.5%)	25 (31.6%)
G.S ward	124 (85.5%)	54 (68.4%)

Table (3) and figure (1) displayed the frequency of presenting complaints among UGIB patients. Melena was the most common complaint at 72% (n=161), followed by hematemesis at 37% (n=82) and hematochezia at 14% (n=31). Other symptoms observed were presyncope (n=36), epigastric pain (n=58), diffuse abdominal pain (n=20), and anemia and jaundice (n=14 and n=19, respectively).

**Table (3):** The frequency distribution of the main presenting symptom among the studied group

Symptom	N	%
Melena	161	72
Hematemesis	82	37
Hematochezia	31	14
Presyncope	36	16
Epigastric pain	58	26
Abdominal pain	20	9
Anaemia	14	6
Jaundice	19	8

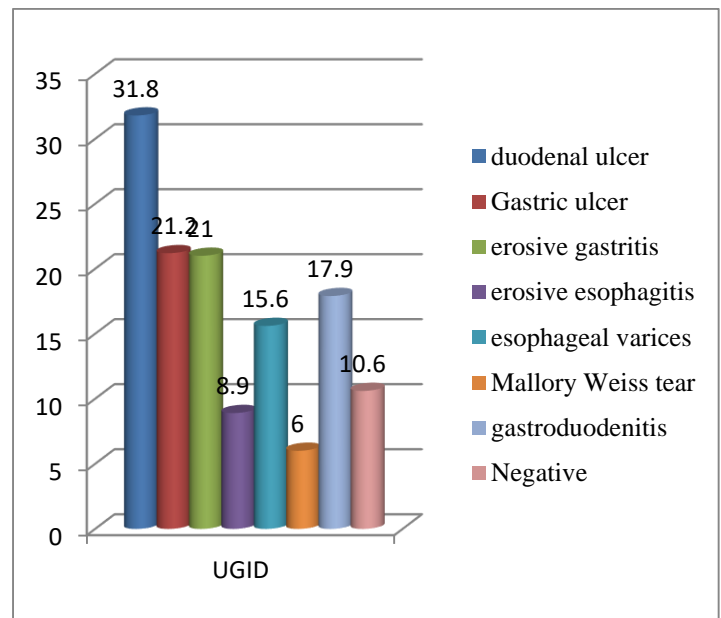


**Figure (1):** Bar chart illustrating the main presenting symptom among the studied group

Table (4) and figure (2) depict the diagnostic esophagogastroduodenoscopy (EGD) findings. The most common source of UGIB was duodenal ulcer (31.8%), followed by gastric ulcer and erosive gastritis (21% each), and esophageal varices (n=28). Erosive esophagitis (9%), Mallory Weiss tear (6%), and gastroduodenitis (n=32) were also observed. However, 19 cases had negative EGD investigations.

**Table (4):** Frequency distribution of findings of diagnostic upper GIT endoscopy among the studied groups

Findings	Study group (n=179)	
	N	%
duodenal ulcer	57	31.8
Gastric ulcer	38	21.2
erosive gastritis	37	21
erosive esophagitis	16	8.9
esophageal varices	28	15.6
Mallory Weiss tear	11	6.0
Gastroduodenitis	32	17.9
Negative	19	10.6



**Figure (2):** Bar chart illustrating the findings of diagnostic upper GIT endoscopy

**Table (5)** indicated a mortality rate of 16% (n=36).

**Table (5):** Outcome and mortality rates of the studied group

Item	Total mortality (n=36)
<b>Age group</b>	
<20	2 (5.6%)
20-60	8 (22.2%)
>60	26 (72.2%)

## DISCUSSION

Upper gastrointestinal bleeding is a prevalent medical emergency, affecting more than 100 out of 100,000 individuals, with a mortality rate of 10% were revealed by **Rockall *et al.*** <sup>(2)</sup> and **Hearnshaw** <sup>(12)</sup>. A timely upper gastrointestinal endoscopy is critical for successful treatment in over 95% of cases reported by **Barkun *et al.*** <sup>(1)</sup>. UGIB constitutes 75% of all acute GIB instances, with an annual incidence ranging from 80 to 150 per 100,000 people shown by the study of **Sehested *et al.*** <sup>(13)</sup>. Patients typically receive care from the medical team responsible for emergency upper GI endoscopy, but leadership and oversight of treatment should not be inflexibly divided. The majority of patients were older than 60 years, with melena and hematemesis being the most common presenting complaints. Other clinical manifestations were also observed, including signs of presyncope, epigastric pain, and diffuse abdominal pain.

In a prior study, **Moledina and Komba** <sup>(14)</sup> reported an acute UGIB to present with various symptoms, including hematemesis, coffee-ground emesis, melena, hematochezia, and syncope. In the current study, the source of UGIB was identified in several patients, with duodenal ulcers accounting for 31.8% of cases, followed by gastric ulcers and erosive gastritis, each affecting 21% of patients. Erosive esophagitis affected 9% of patients, while esophageal varices and Mallory Weiss tears affected 15.6% and 6% of patients, respectively.

**Stanley and Laine** <sup>(15)</sup> noted that various conditions, such as peptic ulcer disease (PUD), including *Helicobacter pylori* infection and NSAID use, can cause UGIB, which accounts for 40-50% of cases. Among PUD, duodenal ulcers are the most common. **Cooper** <sup>(16)</sup> found that erosive esophagitis accounted for 11% of cases and duodenitis accounted for 10%. Other causes include Mallory-Weiss tears and vascular malformations, each accounting for around 5% of cases. In patients who underwent endoscopy, **Moledina and Komba** <sup>(14)</sup> found that oesophageal varices were the most common cause of UGIB (57%), followed by PUD (18%) and gastritis (10%) **Aljarad & Mobayed** <sup>(17)</sup>.

Assessment of a patient with GIB involves clinical history and physical examination to evaluate for signs of shock or blood loss. Certain medical histories, such as alcohol abuse or cirrhosis, can indicate potential sources of bleeding, such as portal gastropathy or esophageal varices, as shown in the study of **Guo *et al.*** <sup>(18)</sup>. Common symptoms of UGIB include hematemesis(40-50%), melena (70-80%), and hematochezia (15-20%) which can indicate the source of bleeding. Other clinical signs such as epigastric pain, dyspepsia, weight loss, and jaundice may also be present, as reported by **Kim *et al.*** <sup>(19)</sup>. In hemodynamically stable patients, diagnostic studies for UGIB were performed. The incidence of detected UGIB sources and their causes was similar to published studies.

EGD is now the preferred method for controlling active ulcer hemorrhage, reducing rates of recurrent bleeding, the need for emergent surgery, and mortality in patients with active UGIB, as reported by **Alema *et al.*** <sup>(20)</sup>.

**Timing of endoscopy:** For patients with active bleeding and hemodynamic instability, immediate EGD is required after initial resuscitation. All admitted patients should receive endoscopy within 24 hours, and access to 24-hour endoscopy services and an on-call endoscopy team is recommended, as reported by **Barkun *et al.*** <sup>(1)</sup>. Delayed EGD increases mortality risk, and repeat intervention may be necessary even after stabilization. Correction of abnormal coagulation should not delay EGD if bleeding is life-threatening, as a study conducted by **Adler** <sup>(5)</sup>; **Wilkins *et al.*** <sup>(8)</sup>; **Nelms & Pelaez** <sup>(35)</sup>. Emergency or out-of-hours endoscopies can be performed in the emergency operating theatre or at the patient's bedside in intensive care. The endoscopist's management plan should be promptly communicated to the clinical team, and nasogastric drainage tube insertion before endoscopy is no longer recommended, which is supported by the study of **Wilkins *et al.*** <sup>(8)</sup>.

**Risk stratification:** It is important to risk stratify patients with acute UGIB to identify those at high risk of adverse events, given the associated morbidity and mortality and reported rebleed rate of 5-20% even after successful endoscopic intervention.

In a follow-up study, variceal causes were the most common (70.1%) in patients with hematemesis and/or melena, followed by non-variceal causes (26.1%) and obscure causes (3.8%). Esophageal varices (EV) represented 17.8% of causes of variceal bleeding, while combined esophageal and gastric varices represented 39.5% and isolated gastric varices 12.8% as revealed by **Elwakil *et al.*** <sup>(21)</sup>. Malignancy was reported as the most common cause of bleeding (23.8%) in another study, followed by varices (19.7%), peptic ulcers (16.3%), and gastroduodenal erosions (10.9%). A study found that 44.9% of patients had died within 30 days and the median survival was 20 days as mentioned by the study of **Maluf-Filho *et al.*** <sup>(22)</sup>. Portal hypertension-related conditions were present in 53.62% of patients in a separate study by **Mahajan & Chandail** <sup>(23)</sup>. The in-hospital mortality rate was 5.83% in this study population.

**Management, Interventional Radiology:** North American guidelines recommend CT angiography in cases of arterial bleeding that cannot be controlled endoscopically or have negative endoscopic findings, such as figures reported by **Expert Panels** <sup>(24)</sup>. NICE recommends considering interventional radiology for unstable patients who rebleed after endoscopic treatment. Further endoscopy should be considered first in cases of high risk of rebleeding or uncertainty about hemostasis as mentioned by the study of **Dworzynski *et al.*** <sup>(25)</sup>.

**Management, Surgery:** Improvements in endoscopic and interventional radiology management have made surgery a last resort for uncontrolled upper gastrointestinal hemorrhage, leading to a 50% decrease in surgery over the past decade. The 2007 BSG audit reported a 2.3% surgical management rate for uncontrolled hemorrhage, as found in the study by **Barkun *et al.***<sup>(1)</sup> & **Hearnshaw *et al.***<sup>(26)</sup>. The type of surgery required depends on the origin and underlying pathology of the hemorrhage, but surgery has a high mortality rate (29%) that has remained unchanged over time as shown in the study of **Feinman & Haut**<sup>(27)</sup> & **Siau *et al.***<sup>(28)</sup>.

**Aljarad and Mobayed**<sup>(17)</sup> found a mortality rate of 9.40% in patients with UGIB, which was associated with a higher mean age. **Moledina and Komba**<sup>(14)</sup> reported a higher mortality rate of 33.5%, significantly associated with elevated white blood cell count and liver enzymes. **Kamboj *et al.***<sup>(30)</sup> reported mortality rates between 2% to 15% for upper GIT bleeding. Mortality in a hospital-based study was 26.5%, with 6.4% dying directly from bleeding as reported by **Klebl *et al.***<sup>(31)</sup>. Variceal bleeding was associated with higher mortality rates. **Aoki *et al.***<sup>(32)</sup> found a 5-year mortality rate of 13%, associated with age 65 and older and the use of nonsteroidal anti-inflammatory drugs. Other studies reported lower mortality rates as mentioned by **Aoki *et al.***<sup>(32)</sup> & **Wilcox *et al.***<sup>(33)</sup>.

#### **Potential limitations when conducting the study**

Managing UGIB is challenging due to the risks associated with invasive procedures in elderly patients with comorbidities. Trials involving such patients are difficult to recruit, leading to underpowered studies with limited conclusions. Conducting a study that accounts for these factors while producing significant results is challenging, and further research is necessary to identify contributing factors and develop appropriate interventions.

#### **CONCLUSION AND RECOMMENDATIONS**

This study found a mortality rate of 16% among the patient population, significantly higher than rates in Western countries. Insufficient resources may contribute to this outcome, suggesting a need for more comprehensive and tailored approaches to managing this condition. Further research is necessary to determine the underlying causes of the higher mortality rate and develop interventions to reduce it.

To establish national guidelines for diagnosing UGIB, follow these steps:

1. Form a team of experts in gastroenterology, emergency medicine, primary care, and diagnostic imaging.

2. Conduct a comprehensive literature review to gather evidence on diagnostic tests, the timing of evaluations, and risk stratification criteria.
3. Define the guidelines' purpose, scope, target population, and desired outcomes.
4. Create clear, specific, and actionable recommendations in the guidelines. Consider using algorithms or flowcharts.
5. Get feedback, finalize the guidelines, and then disseminate them widely through professional societies, healthcare organizations, and government agencies.
6. Monitor guideline implementation to ensure adherence.

#### **ACKNOWLEDGEMENT**

This research was completed with the assistance of colleagues, postgraduate trainees, and staff members from various departments at Al Jalla Hospital - Benghazi. We are grateful to those who reviewed our work and provided support. The study goal was to provide benefits to medical staff, and related professionals, specifically junior physicians who seek to advance in their careers.

**DECLARATION:** This submission certifies that the research title is original and solely authored by the submitting authors. It has not been previously submitted to any organization or publication. All sources used in the research have been appropriately cited and acknowledged according to academic standards.

**COMPETING INTEREST:** The authors of this study declared no competing interests.

**FUNDING:** The authors confirmed that no funding agency supported the research.

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