

Acute upper gastrointestinal bleeding in southern Saudi Arabia: A retrospective observational study

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Abstract

Context: Upper gastrointestinal bleeding (UGIB) is a common life-threatening emergency that carries considerable mortality and morbidity; it remains a common cause for admission to hospitals worldwide.

Aims: To describe present clinical manifestations in southern Saudi Arabian UGIB patients, including both endoscopic and basic laboratory parameters, to assess the risk factors, and compare the predictive power and clinical usefulness of three risk scoring systems for the management of patients presenting with UGIB.

Methods: This was a retrospective observational study. We included 283 patients admitted to the gastrointestinal unit at Abha city, southern Saudi Arabia, from November 2017 to October 2019.

Results: Ages ranged from 18 to 97 years old with mean age of 54.5 ± 18.5 years. The majority of patients were males (72%; 203). Melina was the most common presenting symptom, in 66 (49.3%) patients. Diabetes mellitus was the most frequently recorded risk factor for UGIB (53.9%) followed by hypertension (44.9%), and aspirin use (35.7%). Endoscopic hemostatic treatment was applied in 70 patients (24.7%); 4.9% of patients re-bleed, and 21 patients (7.4%) died during the study period.

Conclusions: Comorbidities such as hypertension and diabetes, in addition to some medicines including ASA, steroids and NSAIDs were identified as risk factors of upper GIT bleeding among this study cases a list of risk factors for severe UGIB, leading to hospitalization and even death.

Keywords: upper gastrointestinal bleeding; UGIB; hemostatic treatment; re-bleeding; variceal

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Received 23 April 2019; Revised 15 June 2020; Accepted 20 June 2020; Published 25 June 2020

Citation: Alzahrani MA, Alfaifi M, Alzahr SA, Saad SS, Alshehri FM, Almatrafi MJ, Hammad MS, Nebrawi KY, Alshehri AM,

Elmalahy TM, Shehata SF. Acute upper gastrointestinal bleeding in southern Saudi Arabia: A retrospective observational study. J Med Sci Res. 2020; 8(3):105-113. DOI: <http://dx.doi.org/10.17727/JMSR.2020/8-15>

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Introduction

Upper gastrointestinal bleeding (UGIB) is a common life-threatening emergency that carries considerable mortality and morbidity and is a common cause for admission to hospitals worldwide [1]. It is characterized by unusual haematemesis and coffee-ground emesis, with/or melena that occurs adjacent to the ligament of Treitz [2]. Currently, emergency esophagogastroduodenoscopy (EGD) is the preferred method of locating the origin of bleeding, evaluating the bleeding rate, interpreting the underlying pathology, and determining the intervention if necessary. However, emergency EGD might be unavailable because of lack of endoscopists and equipment [3]. UGIB is classified as variceal bleeding or non-variceal bleeding because of distinct etiologies and management [4]. Causes of variceal bleeding include esophageal or gastric varices, whereas causes of non-variceal bleeding are mainly peptic ulcers, erosive gastroduodenitis, reflux esophagitis, tumor, and vascular ectasia [3].

Longer life expectancy in almost all countries has led to increased occurrence of comorbid diseases, especially cardiovascular diseases. This has been associated with abuse of non-steroidal anti-inflammatory drugs (NSAIDs), antiaggregants, and anticoagulants that are associated with numerous gastrointestinal problems, including peptic ulcer and gastrointestinal bleeding [5, 6], in addition to widespread obesity and opioid use, both of which are associated with higher risk of developing upper gastrointestinal bleeding [7]. These developments have been occurring during the same time period as major advances in preventive and treatment modalities, including the discovery of *Helicobacter pylori*, proton pump inhibitors, and other pharmacological therapies, as well as the development of novel endoscopic non-invasive and hemostatic modalities [2, 7].

Recent advances in pharmacologic and endoscopic management have led to re-bleeding and mortality of 10%–30% and 2%–15%, respectively [8]. Nevertheless, higher risk of re-bleeding was associated with inaccurate endoscopic hemostasis and presence of comorbidities such as cirrhosis and chronic kidney disease, in addition to high levels of C-reactive protein and hemoglobin [1]. Universal guidelines proposed that subjects at low risk of re-bleeding should be discharged soon after endoscopy [9].

The epidemiology of UGIB, according to hospital-based studies, varies across regions and countries. Loperfido et al. measured the incidence UGIB in 1983–1985 and 2002–2004, and found that the UGIB incidence rate decreased from 112.5 to 89.8 per 100,000 individuals annually [10]. Similarly, in the USA, the incidence of UGIB hospitalizations decreased 21% from 81 per 100,000 in 2002 to 67 per 100,000 individuals in 2012. Nevertheless, more than 250,000 individuals are hospitalized due to upper gastrointestinal bleeding every year [7, 11].

We found that the incidence of UGIB in Saudi Arabia tended to be lower than that reported in western countries. Nevertheless, recent national studies are lacking. A large study carried between January 1980 and July 1994 in Riyadh showed that 4.9% of endoscopies were carried out for UGIB [12]. Another report from Abha City, South Saudi Arabia, found the incidence of hospitalization for acute UGIB was 8.9% [13]. In yet another recent study from western region of Saudi Arabia Central Hospital conducted from January 2015 to December 2017, there were 120 patients with UGIB over these three years [14].

Accurate classification of high-risk patients and identification of low risk patients can aid selection of appropriate candidates for early endoscopic intervention or close follow-up in supervised care contexts. Several risk scoring systems have been developed to help professionals predict mortality, re-bleeding rates, and treatment choices. The most frequent used are the Glasgow Blatchford score (GBS), the Rockall risk score (RS), and the recently described AIMS65 score (AIMS65). These scoring systems categorize findings in three ways: those scores using endoscopic findings only; those using clinical manifestations only; and those using both of endoscopic and clinical findings [8, 15].

Published data from the Saudi Arabia region do not do justice to this issue. Therefore, the aims of this study were to describe present clinical manifestations in southern Saudi Arabian UGIB patients, including both endoscopic and basic laboratory parameters, to assess the risk factors, and compare the predictive power and clinical usefulness of three risk scoring systems (AIMS65 score, Glasgow-Blatchford score, Rockall risk score) for the management of patients presenting with UGIB.

Subjects and methods

Study design

This was a retrospective record based observational study of consecutive patients admitted to the gastrointestinal unit at Abha City, southern Saudi Arabia, from November 2017 to October 2019.

Study sample

All patients with history of haematemesis, melena, hematochezia, or a combination of these symptoms were considered eligible for the study. Inclusion criteria were age more than 18 years, diagnosis of upper GI bleeding. Exclusion criteria were other reason for occult bleeding (e.g., anemia or iron deficiency), melena with no signs of bleeding revealed in endoscopy, pregnancy, and bleeding outside the upper gastrointestinal system.

Data collection

One author reviewed all medical records and entered the following information into a database: age and sex, smoking and GI symptoms, appearance of stool (red or maroon stool, melena, brown or yellow stool), comorbid diseases (acute or chronic kidney diseases, diabetes, hypertension, and cardiovascular diseases), and medications used within one month (NSAIDs, aspirin, and/or anticoagulants). Physical examinations included both systolic and diastolic blood pressure and heart rate at presentation.

The endoscopic findings were reported by a specialized endoscopist as follows: identification of the bleeding lesion, methods of endoscopic hemostasis (agent injection/sclerotherapy, embolization, clips, and band ligation procedures). Laboratory findings included complete blood count, albumin, urea, creatinine, prothrombin time, and activated partial thromboplastin time.

Upper gastrointestinal bleeding was defined as haematemesis or coffee grounds emesis, melena, or rectal bleeding with a confirmed cause of bleeding on upper endoscopy and a negative colonoscopy.

Re-bleeding was defined as recurrent haematemesis, hematochezia, or both; mortality was defined as any death occurring during the study period as result of the initial bleeding episode.

Scores of each patient were calculated based on their record's information. The AIMS65 score is an accurate risk score to predict in-hospital mortality, length of hospital stay, and health care costs in patients with acute UGIB. The AIMS65 consists of the following components: (A) albumin level <3.0 g/dL, (I) international normalized ratio >1.5 , (M) altered mental status, (S) systolic blood pressure ≤ 90 mm Hg, and (65) age >65 years. When more than two components of the AIMS65 are present, the mortality risk is considered to be high [16]. The GBS is a formal risk assessment score for upper GI hemorrhages and uses the patient's blood results, blood pressure, known history and presentation findings to identify how urgently patients require endoscopic therapy [17]. The Rockall score, was developed to assess the risk of death following presentation with UGIB and incorporates patient age, hemodynamics, comorbidities and endoscopic findings. Rockall scores can be calculated both before and after endoscopy, but the post-endoscopic Rockall score provides a more accurate risk assessment [18].

Statistical analysis

Reports were collected, then coded and revised, and data were analyzed using the Statistical Package for Social Sciences logistic, version 20 (IBM Corp., Armonk, NY, USA). Ours was a descriptive study. The normality of continuous variables was tested using the Shapiro-Wilk test. All statistical analyses were done using two-tailed tests with an alpha error of 0.05. A P-value less than 0.05 was considered to be statistically significant. Frequencies and percentages were used to describe the categorical variables whereas means \pm standard deviations (SDs) were used to express continuous variables.

Results

The study included 283 patients with upper gastrointestinal tract bleeding disorders (Table 1). Patient ages ranged from 18 to 97 years old with mean age of 54.5 ± 18.5 years. The majority were males (72%; 203). Melena was most common, reported in 66 (49.3%) patients, followed by haematemesis (36.6%), 13.4% had melena with haematemesis, and 0.7% had coffee-ground emesis. The patients had mean systolic blood pressure of 112 ± 17 mm Hg and diastolic blood pressure of 79 ± 12 mmHg with mean pulse rate 94 ± 19 bpm.

Table 1: Demographic data of patients with acute upper gastrointestinal tract bleeding in Abha, Saudi Arabia.

Bio-demographic data	No	%
<i>Age in years</i>		
< 40	66	23.30
40–60	133	47.00
> 60	84	29.70
<i>Gender</i>		
Male	203	72.00
Female	79	28.00
<i>Presenting symptoms</i>		
Hematemesis	49	36.60
Coffee-ground emesis	1	0.70
Melena	66	49.30
Hematemesis + Melena	18	13.40
<i>Vital signs</i>		
	<i>Mean</i>	<i>SD</i>
SBP	112	17
DBP	79	12
Pulse rate	94	19

Figure 1 illustrates the reported risk factors among the study cases. Diabetes mellitus (DM) was the most frequently recorded risk factor for UGIB (53.9%) followed by hypertension (44.9%), aspirin (35.7%), CLD (20.1%), and steroid intake (15.2%). The least recorded risk factors were celecoxib and alcohol intake (1.1% for each category).

Endoscopic findings are summarized in Table 2. Esophageal endoscopy revealed esophageal varices in 65 patients (23%), esophagitis in 30 (11.1%), Mallory–Weiss tears in 4 (1.4%), and esophageal ulcers in 14 (5%). There were other signs of inflammation in 26 patients (9.3%). Stomach endoscopy revealed that 6% of the patients had fundus ulcers, 4.9% had pyloric ulcers, and 2.8% had antrum ulcers. Regarding ulcer description, 26 patients (9.2%) had clean bases and ten (3.5%) had adherent clots. On duodenal endoscopy, four patients (1.4%) had mass at the duodenum, nine had vascular ectasia (3.2%), and 63 (22.3%) had an ulcer at the first part of the duodenum. Regarding descriptions of duodenal ulcers, it was clean based among 64 (22.6%) cases and 6 cases (2.1%) had black spot in the ulcer center while another six patients had non-bleeding visible vessels.

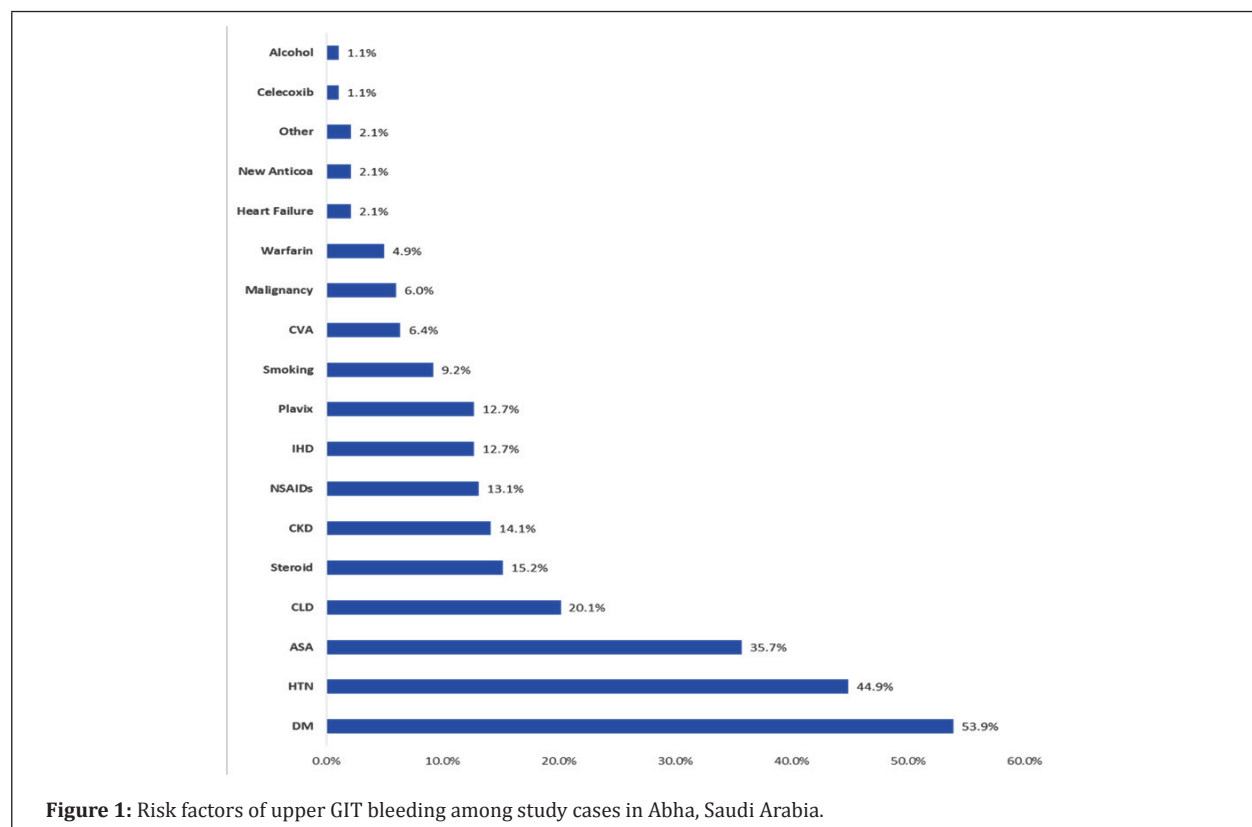


Table 2: Endoscopic findings among cases with upper gastrointestinal tract bleeding in Abha, Saudi Arabia.

Site	Endoscopic findings	No	%			
Esophageal endoscopy	Esophagitis varices	Yes	65	23.0		
	Esophagitis class	Yes	30	11.1		
	Mallory	Yes	4	1.4		
	Esophageal ulcer	Yes	14	5.0		
	Other abnormality	Yes	26	9.3		
Stomach endoscopy	Fundal varices	Yes	15	5.5		
	Mass site stomach	Yes	19	6.7		
	Vascular ectasia	Yes	4	1.4		
	Gastritis	Yes	97	34.3		
	Ulcer site	Fundus		17	6.0	
		Antrum		8	2.8	
		Pre-pylorus and pylorus		14	4.9	
	Ulcer description	Fundus + Antrum		2	0.7	
		Greater curvature pre-pylorus and pylorus		1	0.4	
		Antrum pre-pylorus and pylorus		3	1.1	
		Fundus + Lesser curvature + Greater curvature		1	0.4	
	Duodenal endoscopy	Clean based		26	9.2	
		Ulcer description duodenum	Black spot in the ulcer center		3	1.1
			Adherent clot		10	3.5
Nonbleeding visible vessel				2	0.7	
Duodenal endoscopy		Mass site duodenum	Yes	4	1.4	
		Vascular ectasia duodenum	Yes	9	3.2	
	Ulcer site duodenum	First part		63	22.3	
		Second part		3	1.1	
		First and second parts		2	0.7	
	Ulcer description duodenum	Clean based		64	22.6	
		Black spot in the ulcer center		6	2.1	
		Adherent clot		2	0.7	
	Duodenal endoscopy	Nonbleeding visible vessel		6	2.1	
Spurting artery bleeding			1	0.4		

Table 3 demonstrates hemostasis measures among cases with upper GIT bleeding cases. Of these, 48

patients (17%) underwent band ligation, 13 (4.6%) underwent histoacryl glue, sclerotherapy injection,

and four patients underwent band ligation with histoacryl glue. Bleeding was controlled among 189 cases (66.8%) and 14 cases had re-bleeding (4.9%). Only six patients required surgical intervention while seven underwent arterial embolization.

Laboratory findings of patients with acute upper GIT bleeding are displayed in Table 4. The mean hemoglobin level was 10.4 ± 3.2 g/L, mean hematocrit of $32.1\% \pm 8.8\%$, mean WBCs of 8.9 ± 5.8 , mean platelets of 224.4 ± 132 , and mean albumin of 3.0 ± 0.9 . Only one patient died (0.4%).

Gastrointestinal bleeding score methods and their findings are displayed in Table 5. AIMS65 scores revealed that 61.5% had normal scores while transfusion requirement was reported in 88 patients (31.1%). A total of 21 patients had serious score levels (7.4%). GBS scores were normal for 18 patients (6.4%) and serious outcome scores were recorded for 20 patients (7.1%), while ICU admission or mortality were scored for 18 patients (6.4%). RS scores revealed that none of the patients had normal scores while serious outcomes were detected in 26 patients (9.2%). ICU admission scores were reported in 46 patients (16.3%) (Table 6).

Table 3: Hemostasis measures among cases with upper gastrointestinal tract bleeding in Abha, Saudi Arabia.

Hemostatic measures		No	%
Endoscopic	Band ligation	48	17.0
	Histoacryl glue, sclerotherapy injection	13	4.6
	Hemoclip	2	0.7
	Adrenaline injection	2	0.7
	Band ligation + Histoacryl glue	4	1.4
	Band ligation + Hemoclip	1	0.4
	Bleeding control	Yes	189
Re-bleeding	Yes	14	4.9
Surgery	Yes	6	2.1
Arterial embolization	Yes	7	2.5

Table 4: Laboratory findings of patients with acute upper gastrointestinal tract bleeding in Abha, Saudi Arabia.

CBC	Mean	SD
Hb	10.4	3.2
Hematocrit	32.1	8.8
WBC	8.9	5.8
PLT	224.4	132.0
INR	1.4	1.1
PT	19.1	21.0
APTT	33.5	21.8
Creatinine	1.5	1.7
Urea	62.0	53.8
Albumin	3.0	0.9

Table 5: Gastrointestinal tract bleeding score methods and their findings interpretation.

Score	Findings	No	%	Range	Mean (SD)
AIMS65 score	Normal	174	61.5		
	Transfusion requirement	88	31.1	0-2	0.67 (0.69)
	Mortality	21	7.4		
Glasgow-Blatchford score	Normal	18	6.4		
	Transfusion requirement	227	80.2		
	Serious outcome	20	7.1	0-15	5.1 (3.6)
	ICU admission/ mortality	18	6.4		
	Normal	0	0.0		
Rockall risk score	Transfusion requirement	211	74.6		
	Serious outcome	26	9.2	1-11	4.8 (2.9)
	ICU admission/ mortality	46	16.3		
	Normal	0	0.0		

Table 6: Distribution of death cases by various gastrointestinal tract bleeding.

Score	Findings	No	%	Range	Mean (SD)
AIMS65 score	Normal	174	61.5		
	Transfusion requirement	88	31.1	0-2	0.67 (0.69)
	Serious/mortality	21	7.4		
Glasgow-Blatchford score	Normal	18	6.4		
	Transfusion requirement	227	80.2		
	Serious outcome	20	7.1	0-15	5.1 (3.6)
	ICU admission/mortality	18	6.4		
Rockall risk score	Normal	0	0.0		
	Transfusion requirement	211	74.6		
	Serious outcome	26	9.2	1-11	4.8 (2.9)
	ICU admission/mortality	46	16.3		

Discussion

About 72% of the study populations were males, where 47% of them aged between 40 and 60 years. The most common presenting symptom was melena (almost the half) as the commonest etiology was gastritis (34.3%), duodenum ulcer (23.8%), and esophagitis varices (23%). In previous studies, haematemesis was the most frequent presenting complaint [14, 19]. Duodenal ulcer was the commonest cause of UGIB in the past; however, recently, it was replaced by variceal bleeding due to cirrhosis because of the decreased prevalence of *H. pylori* and increased use of proton pump inhibitors [5, 14, 20]. A study from the northern region of Saudi Arabia reported that prevalence rate of gastric ulcer was two-fold higher than that of duodenal ulcer. The authors said that the use of NSAIDs, *H. pylori* infection, and stress were among the main reason behind this [21].

Endoscopic hemostatic treatment was applied in 70 patients (24.7%); 4.9% of patients re-bled, and only one patient (1.4%) died during the study period. Our results showed that males were predominant, with a

ratio of 2.6:1. This accord with an old Saudi Arabian study and previous reports from various countries where UGIB was more common in males than in females [5, 12, 20]. Furthermore, we demonstrated that older age, current comorbid diseases, especially DM and hypertension, and use of certain drugs were associated with the risk of developing UGIB. Previous studies also supported our findings on clinical conditions in patients with UGIB [22].

The use of low-dose ASA in patients with chronic cardiovascular diseases was associated with increased risk of gastrointestinal bleeding, consistent with findings of a recent Turkish review [6].

Only 4.9% of patients with UGIB re-bled, significantly lower than other rates reported in previous studies inside and outside Saudi Arabia (11%–18%). The mortality rate was also small compared to the death rate indicated in previous reports, where these rates varied from 1.8% to 20.3%. This discrepancy might be due to the higher number of participants in these studies compared to our limited sample size [14, 15, 23-25]. Cheng et al. reported a similar mortality rate (0.5%) [26]. We have reported that endoscopic treatment was used for patients with upper GIS hemorrhage at a rate of 24.7%. A similar rate was reported in a previous study [26]; however, this rate was lower than that reported by Uysal et al. (38.1%). Past research indicated endoscopic treatment of patients with upper gastrointestinal bleeding varied between 24% and 40.3% [26-29].

In our study, we compared the performance of GBS, RS, and AIMS65 scoring systems in predicting primary and secondary outcomes in patients with UGIB. The AIMS65 score was more effective and accurate than the two others in predicting mortality, which is reasonable given that this was the primary purpose of the AIMS65 score [30]. The GBS was developed to predict and assess low-risk UGIB, whereas the RS was created to avoid re-bleeding and death of individuals with upper GI hemorrhage [8]. Some studies returned the same findings or did not reported a superior scoring system [31-33]. By contrast, western studies reported the superiority of Glasgow Blatchford score to the other scores, even in terms of predicting death [24, 26]. For these reasons, argument persists regarding the ideal scoring system that is consistently relevant in clinical sites and predicts all kinds of clinical events.

This present study has some limitations. The retrospective design limits the temporality of the findings. In addition, our study included a single center with a relatively small sample size, possibly causing restriction in the generalizability and power of its findings. Nevertheless, our data (including endoscopic, laboratory and clinical information) were of high quality because all medical records were present and reviewed. Despite its limitations, this is the first study in southern Saudi Arabia to discuss clinical manifestations of UGIB patients and to compare different scoring systems.

Conclusion

There has been a substantial change in the trend of UGIB in southern Saudi Arabia over the past decades, as in other parts of the world; nevertheless, UGIB remains a life-threatening condition, especially among elderly people. Comorbidities such as hypertension and diabetes, in addition to some medicines including ASA, steroids and NSAIDs were identified as risk factors of upper GIT bleeding among this study cases, leading to hospitalization and even death. Our findings may support specialists and those in general practice, where emergency EGD is generally unavailable, to determine optimal treatment approaches more accurately.

Conflicts of interest

Authors declare no conflicts of interest.

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