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(RESEARCH ARTICLE)



## Risk score for assessment of adults with acute gastrointestinal haemorrhage: A prospective study

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### Abstract

Gastrointestinal (GI) bleeding has created an increasing demand for medical and surgical care; in addition, It is potentially serious and considered life-threatening in all age groups. This prospective study aims to find out the most common causes of GI bleedings, the incidence, the mode of treatment, and to investigate whether a simplified clinical score was able to predict the level of severity in the emergency department. About 170 patients aged (19 – 73) years who had been admitted to the emergency department in Baghdad teaching hospital were prospectively evaluated according to the causes of GI bleeding they presented with, the mode of treatment, and the degree of severity. Out of 170 patients included in this study, 95 patients (55.88%) were males, and 75 patients (44.12%) were females, with an average age of 41.11 years. The causes of GI bleeding were peptic ulcer (29.41%), gastritis (18.82%), diverticulitis (8.82%), hemorrhoids (8.23%), colonic cancer (7.64%), inflammatory bowel diseases (7.64%), anal fissure (7.05%), mesenteric ischemia (7.05%) and oesophageal varices (5.29%). Most of the cases of a peptic ulcer due to duodenal ulcer. Diagnostic endoscopy and conservative management were the main modes of treatment in these patients. Peptic ulcer and gastritis appear to be the main causes of GI bleeding, especially upper GI bleeding, while diverticulitis seems to be the main cause of lower GI bleeding and can be managed conservatively. Haemorrhoids and anal fissures will be managed surgically, either elective or emergency surgery. Also, our simplified clinical score appeared to be associated with the detection of the level of severity, which may deserve urgent interventions.

**Keywords:** Gastrointestinal bleeding; Risk score; Hemorrhage; Mode of treatment

### 1. Introduction

GI bleeding is among the most common medical emergency. It is an abnormal condition in which there is a coffee ground vomiting (hematemesis), from the throat, from the rectum (hematochezia), or blood tarry stool (melena); it is a symptom of many diseases rather than a disease itself. Several different conditions can cause gastrointestinal bleeding, and some of these causes may be life-threatening. However, most of these conditions can be healed or managed. Finding the source of the bleed is essential; knowing if the bleeding is coming from the upper or lower digestive tracts can help to make the diagnosis and know the mode of treatment. [1].

#### *Aim of the study*

This study aims to do an analysis of patients with GI bleeding and to investigate whether a simplified clinical score was able to predict the level of severity in the emergency department.

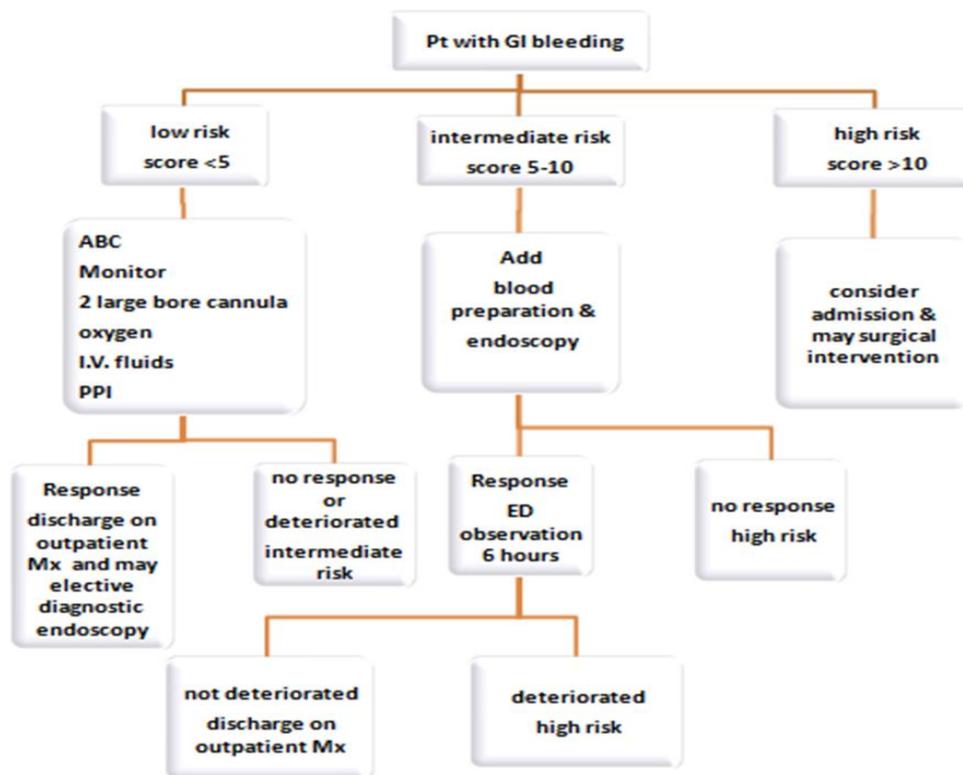
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## 2. Patients and Methods

This is a prospective study of patients with acute GI bleeding (traumatic causes excluded) aged 19 years and above admitted to Baghdad teaching hospital – emergency department from 1st of August 2015 to 31th of December 2015. A total number of 170 adult patients with acute GI bleeding were included in this study. They were divided into five age groups, first age group between 19–30 years, and the second age group between 31-40 years, the third age group between 41-50 years, the fourth age group between 51-60 years, and the fifth age group is above 60 years. Data were collected by designed questionnaires for all patients. Demographic features, causes, past medical history, and mode of treatment were analyzed as the main criteria. Diagnosis of acute GI bleeding was made depending on the good history taking and thorough physical examination, aided by investigations like X-ray, ultrasound, CT scan, and diagnostic endoscopy. All emergency surgeries were done at the operation theatres of Baghdad teaching hospital, and all the diagnostic and therapeutic endoscopes were done at the GIT and liver hospital. In this study, a new risk score (Baghdad score for assessment of the severity of GI bleeding Table (1)) has been established and depended on the most critical variables that may affect the general condition, the mode of treatment, and the disposition of the patient after ED management. Also, these variables are simply collected and easily calculated in the emergency department to assess the severity of the bleeding. Also, from the Baghdad score, we made a new algorithm for the assessment and management of GI bleeding. Figure (1)

**Table 1** Baghdad score for assessment of the severity of GI bleeding.

Variables	Risk marker	Score	
Age (years)	<40	1	
	40-60	2	
	Above 60	3	
Hb (mg\dl)	Men	>12	1
		10-12	2
		<10	3
	Women	10-12	1
		<10	2
Heart rate (beats\min)	<90	1	
	90-110	2	
	>110	3	
SBP	>110	1	
	90-110	2	
	<90	3	
Risk factors	No risk factors	0	
	Chronic medication use	1	
	Current smoker	1	
	Chronic alcoholism	1	
	Known liver disease, cirrhosis	2	
	Chronic Renal failure	2	
	Malignancy	2	
	Previous GI bleeding	2	
	Presentation with Syncope	2	
	Congestive heart failure	2	
<5 low risk			
5-10 intermediate risk			
>10 high risk			



**Figure 1** Algorithm for the assessment and management of GI bleeding.

### 3. Results

The numbers of males were 95 (55.88%), and females were 75 (44.12%) and the mean age of the patients was 41.11 (range from 19 – 73) years. The first age group includes 29 patients (17.06%), the second age group includes 53 patients (31.18%), the third age group includes 54 patients (31.76%), the fourth age group includes 25 patients (14.71%), and the fifth age group includes nine patients (5.29%). From the 170 patients: 91 patients (53.5%) complained of upper GI bleeding, 79 patients (46.5%) complained of lower GI bleeding. The main causes of GI bleeding in this study were peptic ulcer (29.41%), gastritis (18.82%), diverticulitis (8.82%), haemorrhoids (8.23%), colonic cancer (7.64%), inflammatory bowel diseases (7.64%), anal fissure (7.05%), mesenteric ischemia (7.05%), and oesophageal varices (5.29%). Of the 170 patients, 101 patients (59.41%) had a history of chronic medical diseases, 61 patients (60.4%) of them had a single concomitant disease like (Diabetes mellitus (DM), Hypertension (HT), ischemic heart disease (IHD), atrial fibrillation (AF), and liver cirrhosis), the other 50 patients (39.6%) had more than one disease. Sixty-nine patients (40.6%) had no previous chronic medical illness. Regarding male: female ratio 44 males (49.44%) and 45 females (50.56%) did diagnostic endoscopy, while 52 patients (30.58%) did surgery, 35 males (67.3%) and 17 females (32.7%). 29 patients (17.05%) had conservative management only, 16 males (55.1%) and 13 females (44.9%). Among 52 patients who did the surgery, 18 patients (34.61%) did emergency surgery in Baghdad teaching hospital-operation theatre, while 34 patients (65.38%) gave appointments for elective surgery. Also, the greater percentage of patients that did elective surgery in the second age group (38.2%) and the greater percentage of patients that did emergency surgery in the third age group (44.4%). Among 34 patients (65.3%) did elective surgery, 25 patients (73.5%) were males and 9 patients (26.5%) were females. While 10 male patients (55.5%) and 8 female patients (44.5%) did emergency surgery. The higher number of patients did elective surgery was distributed in the second age group, about 13 patients (38.2%) and the higher number of patients did emergency surgery was distributed in the third age group, about eight patients (44.5%). Regarding the past medical history, 11 patients (91.6%) of 12 patients diagnosed as mesenteric ischemia showed a history of chronic AF while 7 patients (53.8%) of 13 patients with colonic cancer showed DM & HT in their PMH. 1/3 of patients with inflammatory bowel diseases show HT in their PMH, and about 1/4 of patients with gastritis also show HT in their PMH. According to our simplified new score, 65 patients (38.2%) classified as a low-risk group, 89 patients (52.3%) as an intermediate-risk group, and 16 patients (9.41%) as high-risk score who may require surgical intervention in their management, Table (2) Distribution of patients by Baghdad score.

**Table 2** Distribution of patients by Baghdad score.

Variables	Risk marker	Score	No.	
Age (years)	<40	1	82	
	40-60	2	79	
	Above 60	3	9	
Hb (mg\dl)	Men	>12	1	63
		10-12	2	24
		<10	3	8
	Women	10-12	1	69
		<10	2	6
Heart rate (beats\min)	<90	1	99	
	90-110	2	45	
	>110	3	26	
SBP	>110	1	98	
	90-110	2	56	
	<90	3	16	
Risk factors	No risk factors	0	69	
	Chronic medication use	1	79	
	Current smoker	1	43	
	Chronic alcoholism	1	27	
	Known liver disease, cirrhosis	2	9	
	Chronic Renal failure	2	8	
	Malignancy	2	13	
	Previous GI bleeding	2	7	
	Presentation with Syncope	2	13	
	Congestive heart failure	2	19	
<5 low-risk group			65	
5-10 intermediate-risk group			89	
>10 high-risk group			16	

#### 4. Discussion

This study shows that over five months, a considerable number of adult patients needed diagnostic endoscopy. The number of adult people requiring surgical management (elective or emergency) is continuously rising secondary to the significant increase in life expectancy in recent times. It also showed that female patients underwent emergency diagnostic endoscopy more than male patients while male patients did surgery (elective or emergency) more than females. The mean age of this study population was 41.11 years, with 95 male patients (55.88%) and 75 female patients (44.12%). This result is too close with ON Alema et al.[2] who's calculate the mean age of his study was 42 years with (50.4%) males and (49.6%) females, while Mohammad J. Kaviani et al.[3] and Abdulbaset Elghuel [4] calculate the mean age was 54.9 years with (60.3%) males and(39.7%) females. We observed that the number of patients complained from

upper GI bleeding about 91 patients (53.5%), lower GI bleeding about 79 patients (46.5%); these results are too close to the results of Peura DA et al.[5] who concludes the percentage of upper GI bleeding about (76%) and the percentage of lower GI bleeding about (24%). Peptic ulcer disease (gastric or duodenal) is the most common cause of upper GI bleeding; it accounts for 50 patients (29.4%) among 170 patients, especially in the second age group and (42.3%) among 118 patients complained of upper GI bleeding. This percentage (42.3%) is slightly elevated than the percentages of Olusegun I Alatisie et al. [6], Who concluded that only (30.6%) of patients showed peptic ulcer as a cause, Cyrla Zaltman et al. [7] found that only (35%) of patients complained from this disease, and Samuel Quan et al.[8] conclude that (85.2%) of patients complained from peptic ulcer as a source of upper GI bleeding, While Segni M. Ayana et al. [9] concluded that gastritis is the most common cause of upper GI bleeding. This study showed that duodenal ulcer is the most common cause of peptic ulcer diseases about 32 (64%) patients among 50 patients complained from a duodenal ulcer which was diagnosed by emergency diagnostic endoscopy and showed that higher male incidence about 18 (56.25%) male patients among 32 patients. This, in agreement with Ajayi et al.[10] and Johann P Hreinsson et al.[11], who showed a higher percentage of duodenal ulcers, while Mohammad J Kaviani et al.[3] and Thad Wilkins et al.[12] showed that gastric ulcers were the higher prevalence. Erosive gastritis is the second most common cause of upper GI bleedings; it accounts for 32 (18.82%) patients among 170 patients, who were diagnosed by emergency diagnostic endoscopy, and the higher rate at the second age group (30-40) years. 23 (71.87%) patients their gastritis caused by H.pylori infection while the other 9 (28.13%) patients their gastritis caused by bile reflux. This in agreement with M Kaliamurthy et al.[13] who observed that gastritis was the second most common cause of upper GI bleeding, while Segni M. et al.[9] said that gastritis was the most common cause, and Sohail Bhutta et al.[14] showed that gastritis is the least common cause. Diverticulitis, which is the first most common cause of lower GI bleeding, accounts for 15 (10.71%) patients among 170 patients who were distributed mainly in the third age group. This, in agreement with John B. Adams et al.[15] who considered that diverticulitis is the main cause of lower GI bleeding, while Machicado GA et al.[16] showed that diverticulitis was the second most common cause considering angiomata as the first most common cause of lower GI bleeding. Inflammatory bowel disease, which is one of the causes of lower GI bleeding, represents 13 patients (7.64%) of a total number of patients who were distributed in the second and third age group. Infectious causes represent 7 (53.8%) of these patients. This agrees with Wehkamp J. et al.[17] who also considered infectious inflammatory bowel disease as the most common cause. Mesenteric vascular occlusion is an expected surgical emergency, especially in those with cardiovascular diseases like atrial fibrillation. This study showed that it is an uncommon cause of GI bleeding, the incidence is (7.05%) especially in the third age group, and 12 patients out of 170 patients complained of lower GI bleeding due to this cause. All of them did emergency laparotomy. This is in agreement with N. J. Menon et al.[18] and Oldenburg W. et al.[19] who showed that mesenteric ischemia is a rare cause, but it is a life-threatening and fatal cause of lower GI bleeding. This study also showed the most important effect of the endoscope as a diagnostic and therapeutic role in the management of GI bleeding, especially upper GI bleeding. Among 49 patients out of 50 patients diagnosed by emergency endoscope as a peptic ulcer (whether gastric or duodenal) and managed by sclerotherapy then they put on conservative management for 2 to 3 weeks, at the same time 32 patients complained from GI bleeding diagnosed by endoscope as gastritis (whether due to H. pylori or bile reflux) and managed at the same time by sclerotherapy then put on conservative management for 2 to 3 weeks. This is in agreement with Sarin N et al.[20], Christopher J. et al.[21], and SJ Tang [22] who considered the endoscope as a primary modality of management as diagnostic and therapeutic tools. All patients with haemorrhoids gave elective surgery except one patient diagnosed as thrombosed external haemorrhoids and did emergency surgery. At the same time, all patients diagnosed by physical examination as an anal fissure gave an appointment for elective surgery after a prescribed course of conservative management. Also, both haemorrhoids and anal fissure classified in this study as a rare cause of lower GI bleeding. This agrees with David A. Edelman et al.[23] who also showed haemorrhoids and anal fissure rare causes of lower GI bleeding. In this study, the percentage of patients who did endoscopy about 52.3%. This agrees with Custódio Lima J[24] who found that 55.2% of patients did an endoscopy, while Chang-Yuan Wang et al.[25] found that 9.09% of patients required endoscopy. Also, the Rockall score established to show the relative importance of risk factors for mortality after acute upper gastrointestinal haemorrhage[26], avoiding complications of the haemoglobin level and some of the risk factors in these patients. About 105 patients (61.8%) in this study received interventions (endoscopy, blood transfusion, and may surgical intervention); this is in close range with Ozlem K. et al.[27] who found that 55.6% of patients need intervention after admission, while Ahn S. et al.[28] notice that 87.6% of patients received interventions and Stevenson J. et al.[29] who found that 43.2% of patients required intervention. Also, the Blatchford score has excellent sensitivity. However, suboptimal specificity limits its role as the sole means of decision making in cancer patients with UGIB, avoiding age as a mean variable and some of the risk factors. We also noticed that the percentage of patients classified in the low-risk group is 38.2%. This percentage is too close to the percentage found by Tammaro L et al.[30] who concludes that 40% of patients were classified as T3 (low risk), but there is a clear difference between the percentages of the other risk groups. Also, the T score established to investigate whether a simplified clinical score before endoscopy in upper gastrointestinal bleeding (UGIB) patients could predict endoscopic findings at urgent endoscopy, avoiding the age and the comorbidities that may affect the distribution of the patients on the level of severity.

## 5. Conclusion

- Peptic ulcer and erosive gastritis appear to be the main causes of upper GI bleeding in adult people, so we should focus our attention on these pathologies.
  - Diverticulitis and inflammatory bowel disease appear to be the main cause of lower GI bleeding in adult people, so we should be careful of any patient complained of these pathologies.
  - Diagnostic endoscopy and conservative management is the main mode of treatment, and the endoscope used as diagnostic and therapeutic tools at the same time.
  - Our simplified clinical score appeared to be associated with the detection of the level of severity, which may deserve urgent interventions (endoscopy, blood transfusion, and maybe surgical interventions). A further, randomized study is needed to assess its accuracy in safely disposition and management of patients.
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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

*The authors declare that there is no conflict of interest in the present study.*

### *Statement of informed consent*

*Informed consent was obtained from all individual participants included in the study.*

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