Analysis of Clinical Rockall Score in patients with Acute Upper Gastrointestinal Bleeding in the Emergency Services of a Tertiary Hospital

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ABSTRACT

Introduction: Upper gastrointestinal bleeding (UGIB) is a gastrointestinal emergency. It is characterized by hematemesis or melena or both. Rapid identification and stabilization of patients with upper gastro-intestinal bleeding presenting to the Emergency Department (ED) is essential for patient survival. This study was done to inspect the use of the Clinical Rockall score to predict the outcome in patients with UGIB.

Methods: A prospective study of two hundred and seventy two patients who presented to the ED of T.U. Teaching hospital within a period of one year with hematemesis or melena or both was performed. The Clinical Rockall Score was calculated for each patient based on the points assigned for clinical variables.

Results: The mean age of patients with AUGIB was 47.83years with males (64.7%). The commonest cause of UGIB was esophageal varices 86 (31.6%), followed by ulcers 53 (19.5%). Hematemesis was the commonest mode of presentation in 133 (48.9%) followed by melena in 95 (34.9%) and both in 44 patients(16.2%). The overall mortality rate was 14.3% and was 0%, 0%, 9.3%, 3.2%, 6.5%, 62.1%, 83.3% and 100% for Clinical Rockall Score of 0,1,2,3,4,5,6 and 7 respectively. High clinical Rockall score of >4 was associated with outcomes like transfusion in 81% patients, rebleeding in 61.9% and mortality in 69% of patients. The predictive accuracy of clinical Rockall score for transfusion, the AUROC was 0.737(95% CI: 0.678-0.791, p=0.001); for rebleeding, the AUROC was 0.863 (95% CI: 0.8-0.927, p=0.001) and for mortality, the AUROC was 0.877 (95% CI: 0.81-0.944, p=0.001).

Conclusions: Clinical Rockall Score is a simple and rapid non endoscopic risk score that can be applied at the time of presentation to the ED to predict mortality outcomes in patients with acute UGIB.

Keywords: Acute upper gastrointestinal bleeding; Clinical Rockall Score; mortality; outcome

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a common gastrointestinal emergency throughout the world and a cause of significant morbidity and mortality.[1] AUGIB presents either as passage of black tarry stools (melena) or as passage of fresh blood or coffee ground vomitus(hematemesis).

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The etiology of AUGIB varies from trivial causes like gastric erosions to potentially severe conditions like variceal bleed and ulcer bleed.[2]

Accurate risk assessment for triaging and prognostication is very important to facilitate discharge of low risk patients from the emergency department and enable urgent active intervention and intensive care monitoring in high risk patients. Several risk scores have been used to predict the clinical outcomes in patients with UGIB.[3] An ideal risk score is the one that is easy to calculate, accurate for relevant outcome and can be measured early after presentation with UGIB. The most widely applied scoring

systems include the Glasgow- Blatchford Bleeding Score(GBS), AIMS65 score and the Clinical Rockall Score.[4,5] These scores utilize only the pre endoscopic criteria. The most commonly used risk scoring system in UGIB is the Rockall Score which was described in 1996 following the analysis of data from a large English audit. The Clinical Rockall Score relies only on clinical variables and is used to identify patients who have an adverse outcome such as death or recurrent bleeding. [6,7] The Clinical Rockall Score consisted of the following components: The patients age, the hemodynamic status and the occurrence of a comorbid disease. A maximum score of 7 is possible. The aim of this study was to assess the clinical usefulness and prognostic value of the Clinical Rockall Score in rebleeding and mortality of patients presenting to the Emergency Department with UGIB.

METHODS

This was a hospital based descriptive cross sectional study conducted in the Emergency Department of the Institute of medicine, Tribhuwan University Teaching hospital from May 2017 to April 2018. This study was approved by the Institutional Review Board of Institute of Medicine, Tribhuwan University Teaching Hospital. Patients presenting to the Emergency of Teaching hospital with hematemesis or melena or both who gave written consent for the study were included in the study. For each patient at the emergency room, the baseline clinical data along with co morbid conditions like chronic liver disease, cirrhosis of liver, chronic kidney disease, chronic obstructive lung disease, the laboratory reports including a complete hemogram, liver function tests, renal function tests and arterial blood gas analysis, chest x ray, electrocardiogram, ultrasonography of abdomen and pelvis, transfused blood units, length of hospital stay, rebleeding and outcome after 28 days were all recorded. All the patients were resuscitated according to the standard protocol of upper gastrointestinal bleeding management guidelines of the Emergency room. Clinical Rockall Score was calculated for each patient which included the age of the patient, whether the patient presented in shock or not and the comorbidity of the patient. The patients were admitted in the intensive care unit, medical intensive care unit, general wards or observation room of

the emergency after full resuscitation in the emergency room. The patients were followed up at 28th day in terms of mortality outcome by using hospital landline phone or mobile of the principal investigator. The association of 28 day outcome with the Clinical Rockall score was examined.

Data was entered into Microsoft Excel and analysed by using SPSS (Statistical Product and Service Solutions).

RESULTS

A total of 272 patients of UGIB were included in the study. The mean age of the patients was 47.83 years with the age range from 18 to 88 years. Majority of patients 176 (64.7%) were males and only 96 (35.3%) were females. Majority of the patients were in the age group of 37-56 years. The clinical presentation of the patients (Table 1) mainly in the form of hematemesis was 133 (n=272, 48.9%). Melena was seen in 95 (34.9 %) of patients whereas 44 patients (16.2%) presented with both the symptoms. Chronic liver disease was the most common co morbidity with 80 patients (29.9%) suffering from it. It was found out that the mean haemoglobin was 9.58g/dl +/- 3.11SD, the mean serum creatinine level was 127.1mg/dl +/- 81.34SD which was slightly higher than the upper limit of the reference laboratory value of the ER.

Table 1. Clinical parameters of patients presenting with Upper gastrointestinal bleeding.

Particulars	n(%) or mean +/- SD
Mean age (year)	47.83 +/-15.39
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Male: n(%)	176 (64.7)
Symptom at presentation	
Hematemesis	133 (48.9)
Melena	95 (34.9)
Both	44 (16.2)
Duration of symptoms (days)	2.78 +/- 1.91
Personal History	
Alcohol	107 (39.4)
Smoking	53 (19.5)
Both(Alcohol + smoking)	33 (12.1)

Tobacco	6 (2.2)
None	73 (26.8)
Co morbidities:	
Chronic liver disease	80 (29.4)
Kidney disease	7 (2.57)
DM	8 (2.94)
HTN	19 (6.98)
IHD	6 (2.20)
COPD	18 (6.61)
None	100 (36.76)
Drug History:	
NSAIDS	5 (1.8)
Aspirin	19 (6.98)
Warfarin	3 (1.1)
Corticosteroids	5 (1.83)
Shock	
Tachycardia (HR>100)	177 (65.1)
Systolic BP (<100)	86 (31.6)
Both	75 (27.57)

DM= Diabetes mellitus, HTN= Hypertension, IHD= Ischemic heart disease, COPD= Chronic Obstructive pulmonary disease, NSAIDS= Non steroidal anti inflammatory drugs , HR=Heart rate , BP=Blood pressure

Table 2 shows the etiology of the UGIB patients as per the UGI endoscopic findings. Of the causes that were attributed to UGIB, variceal bleeding was the most common 86 (31.6%) followed by ulcers in 53 patients.

Table 2. Etiology of Upper gastrointestinal bleeding.

UGIEndoscopic Diagnosis	n (%)
Esophagus	
Esophagitis	8 (2.9)
Esophageal ulcer	2 (0.7)
Mallory weiss Tear	13 (4.8)
Varices	86 (31.6)
Post EVL ulcer bleed	4 (1.5)
Stomach	
Gastric ulcer	25 (9.2)
Gastric Carcinoma	5 (1.9)
Erosive gastritis	36 (13.2)
Antral gastritis	31 (11.4)
Pangastritis	9 (3.3)

Gastric polyp	5 (1.9)
Portal hypertensive gastropathy	12 (4.4)
Duodenum	
Duodenal ulcer	26 (9.5)
Duodenitis	1 (0.4)
Normal	9 (3.3)

The management of the patients was done in the ER as per the standard ER protocol for UGIB. Proton pump inhibitors in the form of intravenous pantoprazole was received by 163 patients (59.9%) whereas somatostatin analogues in the form of intravenous octreotide was received by 82 patients (30.1%) and octreotide infusion as well as intravenous Terlipressin was given in 23 patients (8.5%). Out of the 114 patients who received transfusion in the form of whole blood, packed red blood cells, fresh frozen plasma or platelet rich plasma, 46 patients received more than 2 units of transfusion.

The Clinical Rockall Score was calculated based on the collected data. (Table 3) and the relationship between Clinical Rockall score and the patient outcome in terms of transfusion, rebleeding and mortality was observed. The distribution of patients classified into three risk categories (low, moderate and high) as determined by the Clinical Rockall scoring system, and the observed values of transfusion, rebleeding and mortality in each risk category are shown in Table 4.

Table 3. Relationship between Clinical Rockall Score and patient outcome.

Variables	Clinical Rockall Score							
	0	1	2	3	4	5	6	7
Number	29	34	43	62	62	29	12	1
Transfusion	2	8	16	20	34	24	9	1
Rebleeding	0	0	3	3	7	17	8	1
Mortality	0	0	4	2	4	18	10	1

Table 4. Percentages of Transfusion/ rebleeding/ death in each risk category.

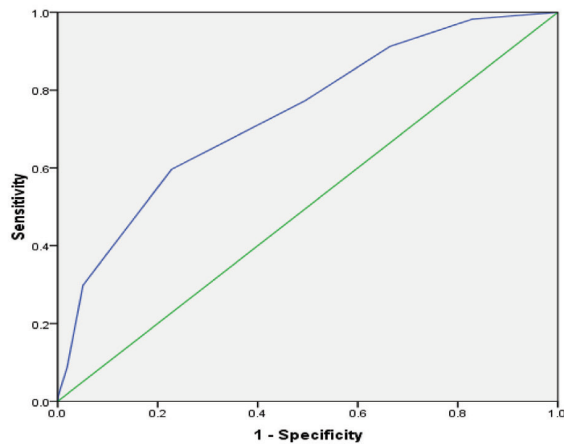| Category	Cases	Outcome		
		Transfu-sion	Rebleed-ing	Mortal-ity
Low risk (2)	106	26 (24.5)	3 (2.8)	4 (3.8)
Moderate risk (3-4)	124	54 (43.5)	10 (8.1)	6 (4.8)
High Risk (>4)	42	34 (81)	26 (61.9)	29 (69)

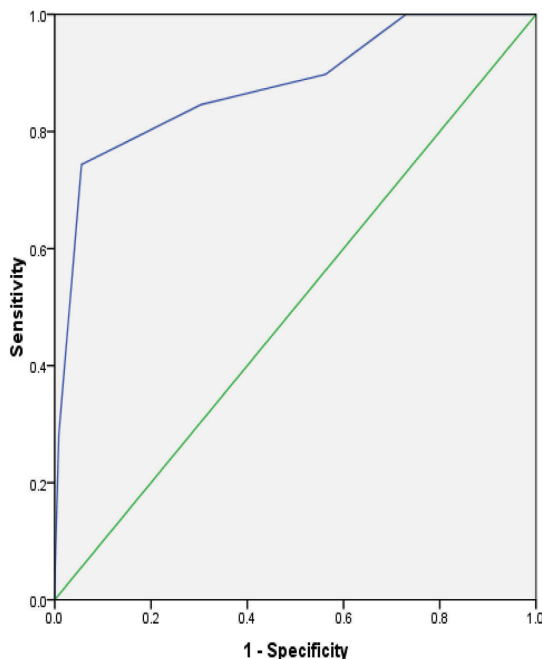**FIGURE 1.** ROC analysis of Clinical Rockall score for outcome measure: Transfusion.

Figure 3. ROC analysis of Clinical Rockall score for outcome measure: Mortality.

Table 5: **Predictive accuracy of Clinical Rockall Score for different outcome measures.**

Outcome measures	AU-ROC (95% CI)	Stand-ard error	p-value	95% CI	
				Lower bound	Upper bound
Transfusion	0.737	0.03	<0.001	0.678	0.797
Rebleeding	0.863	0.033	<0.001	0.80	0.927
Mortality	0.877	0.034	<0.001	0.81	0.944

DISCUSSION

UGIB is one of the common medical emergencies encountered in everyday clinical practice. In our study, it was more common among the males (64.7%) as compared to females (35.3%). This was similar to a prospective study by Hreinsson etal published in 2013 (males vs females: 58% vs 42%).[8] The mean age of the patients in our study was 47.83 years +/- 15.39SD which had similar results as a study done by Kim et al enrolling 1929 patients with a mean age of 52 years.[9] Variceal causes of UGIB comprised 86 (31.3%) of the cases followed by ulcers 53 (19.5%) and erosive and antral gastritis, 13.2% and 11.4% respectively. This differed from a study done by Parvez et al which showed that the most common etiology of UGIB was peptic ulcer (40.5%).[10] A previous study from Nepal by Paudel et al in 2017 among 100 patients had 43 patients with peptic ulcer followed by 23 of them with variceal bleed. [11,12]

The Clinical Rockall score is a scoring system for UGIB which is calculated without the endoscopic findings and include 3 clinical variables: the patient's age, the haemodynamic status and the occurrence of a co morbid disease. A maximum score of 7 is possible. A higher Clinical Rockall score indicated a higher risk of adverse outcomes . In the present study, we found out that 114 patients (41.9%) needed transfusion of blood and blood products, rebleeding was seen in 39 (14.3%) whereas mortality was seen in all of the 39 patients with rebleeding. Tham et al reported that patients under the low risk category with a clinical Rockall score of 0, can be managed in the out patient setting since these patients had no adverse outcomes and did not require transfusion.[13] This was similar in our study as well in terms of rebleeding and

mortality however 2 of these patients needed transfusion. Regarding the high risk patients with a clinical Rockall score of >4, our study showed a mortality rate of 69%, 61.9% of the patients rebled and 81% received transfusion in the form of blood and blood products. Our result was higher than a study by Phang et al demonstrated that the mortality rate in high risk patients with a score of >4 was 22.4%[14] The predictive accuracy of clinical Rockall score for transfusion, the AUROC was 0.737(95% CI: 0.678-0.791, p=0.001); for rebleeding, the AUROC was 0.863 (95% CI: 0.8-0.927, p=0.001) and for mortality, the AUROC was 0.877 (95% CI: 0.81-0.944, p=0.001). Our results were consistent with those of other studies like Sanders et al in 2002 and Sarwar et al in 2007 which suggested that clinical Rockall score had good predictive value for mortality outcomes.[15,16]

CONCLUSIONS

In conclusion, our study shows that the Clinical Rockall score has satisfactory predictive accuracy for outcomes like transfusion, rebleeding and mortality and can be used as an important tool in the emergency room in patients with UGIB.

We recommend the use of non endoscopic scores like clinical Rockall score in the emergency room as a decision tool to predict the outcome in patients with UGIB with a view to improve patient management and promote cost effective use of resources.

CONFLICT OF INTEREST: None

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