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COMPARISON OF VARIOUS SCORING SYSTEMS IN PATIENTS PRESENTING WITH UPPER GASTROINTESTINAL BLEEDING AND ITS CORRELATION WITH PROGNOSIS AND SURVIVAL

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ABSTRACT
Objective: To Compare various scoring systems in patients presenting with upper gastrointestinal bleeding and its correlation with prognosis and survival. Design: Observational cross sectional study. Setting: Department of Gastroenterology, Government Medical College and Super specialty hospital, Nagpur, Maharashtra. Participants: 80 patients presenting with upper gastrointestinal bleeding were included in study. Main outcome Measures: Comparison of Full Rockall, AIMS-65, Glasgow Blatchford and PNED scores for their ability to predict clinical outcome in the form of Rebleeding, intervention needed, 1 month mortality and 3 month mortality. Results: Total 80 patients were included in the study. 72 patients were presented with haematemesis, 43 patients were presented with malena, 13 patients had syncope, 38 patients had H/o Alcoholism, 10 patients had hepatic disease, 1 patient had altered sensorium. Three patients at 1 month and seven patients at 3 month had Rebleeding. No patients had died at 1 month and 5 patients were died at 3 month. GBS score had highest sensitivity in predicting need of intervention and mortality. Full rockall and AIMS 65 scoring system also had high sensitivity in predicting need of intervention and mortality. PNED score had low sensitivity in predicting mortality but had high sensitivity in predicting need of intervention. Conclusions: The Glasgow Blatchford score has high accuracy for predicting need for hospital based intervention and death as compared to other scoring systems.

KEYWORDS: Full Rockall, AIMS-65, Glasgow Blatchford and PNED.

INTRODUCTION
Upper gastrointestinal bleeding is a common cause of admission to hospital worldwide, with a UK incidence of 103-172 per 100 000 adults each year and mortality of 8-14%.[1-3] Many risk assessment scores have been developed to predict clinically relevant outcomes, including mortality, need for hospital based intervention, rebleeding and length of hospital stay.[4-9] Several of these, including the Rockall score and recently described progetto nazionale emorragia digestive (PNED) score require endoscopy before calculation.[4]

The Rockall score has been widely reported and it has been suggested that the PNED score is superior to it although it has not been externally validated[5]. Other endoscopy based scores have been described but are not appropriate for unselected patients with upper gastrointestinal bleeding, have not been externally validated or have been shown to be inferior to the Rockall score or PNED score.[10] However, requiring endoscopy to calculate a score might delay risk assessment in some healthcare settings, as there can be considerable delays in performing endoscopy out of hours.[11]

Recently, much interest has been shown in pre-endoscopy risk scores for upper gastrointestinal bleeding which can be calculated shortly after presentation to hospital.

The most widely studied scores are the abbreviated "admission" Rockall score, Glasgow Blatchford score, and recently described AIMS65 (albumin level <30 g/L (A), international normalised ratio >1.5 (I), altered mental status (M), systolic blood pressure ≤90 mm Hg (S) and age >65 years (65)) score.[7,8] These scoring systems use clinical, haemodynamic and (for Glasgow Blatchford and AIMS65 scores) readily available laboratory variables. Some studies have suggested that these scores could be used to identify patients at very low risk who could be managed as outpatients.[12] Studies have also suggested that these scores could identify

patients at higher risk who might require urgent endoscopy or management in high dependency or intensive care units.[15]

Several studies have compared scores in their ability to predict various outcomes.[16] Although the Glasgow Blatchford score seems useful in identifying very low risk patients in the UK many studies have been small and single centre and no international study has compared all the commonly used scores. Recent guidelines have suggested use of risk scores for patients with upper gastrointestinal bleeding, but uncertainty remains about their exact role in clinical practice.[20-23]

In this cross sectional observational study we compared five endoscopic and pre-endoscopic risk assessment scores for their ability to predict clinically relevant endpoints and predicts survival and prognosis of patients.

In addition we assessed the clinical utility of these scores, by determining optimal thresholds for identifying patients at very low risk who could be managed as outpatients and higher risk patients who might require specific management strategies aimed at improving outcome.

Scoring systems for UGIT bleeding we compared are as following.

1) Glasgow-Blatchford Score.

Glasgow-Blatchford Score	
Admission risk marker	**Score component value**
Blood Urea (mmol/dL)	
6.5-8.0	2
8.0-10.0	3
10.0-25	4
>25	6
Haemoglobin (g/dL) for male	
12.0-12.9	1
10.0-11.9	3
<10.0	6
Haemoglobin (g/dL) for female	
10.0-11.9	1
<10.0	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
<90	3
Other markers	
Pulse ≥100 (per min)	1
Presentation with melaena	1
Presentation with syncope	2
Hepatic disease	2
Cardiac failure	2

Low risk= 0, Any score higher than 0 is high risk for needing intervention: blood transfusion, endoscopy or surgery.

2) Total Full Rockall Score.

Variable	**Score 0**	**Score 1**	**Score 2**	**Score 3**
Age	<60	60- 79	>80	
Shock	No shock	Pulse >100 BP >100 Systolic	SBP <100	
Co-morbidity	Nil major		CHF, IHD, major morbidity	Renal failure, liver failure, metastatic cancer
Diagnosis	Mallory weiss/ NO pathology	All other diagnoses	GI malignancy	
Evidence of bleeding	None		Blood, adherent clot, spurting vessel	

Rockall score less than 3 carries good prognosis but score more than 8 carries high risk of mortality.

3) AIMS 65 Scoring System

1) Albumin level <3.0 g/dL (A)----------1
2) International normalized ratio (INR) >1.5 (I)----------1
3) Altered Mental status (M)----------1
4) Systolic blood pressure ≤90 mm Hg (S)----------1
5) Age >65 years (65) ----------1

AIMS score more than 2 predicts higher mortality rate.

4) Progetto Nazionale Emorragia Digestive Score
Score 1 2 3 4
ASA 3 Hb < 7 gm % Re-bleeding Failure of
Time to Age > 80 kg ASA 4 Endoscopic
Admission Renal Neoplasia treatment
< 8hrs Failure Liver cirrhosis
This is Italian score was developed and validated to predict 30 days mortality after non-variceal bleeding.

MATERIALS AND METHODS

Institutional ethics committee approval was obtained before the study. The approval code is 1362 EC/Pharmac/GMC/NGP dated 4th may 2018. Patients presented with UGI bleeding during study period of one year from 2018 to 2019 were enrolled in this study at Department of Gastroenterology, Government Medical College and Super speciality hospital, Nagpur, Maharashtra. This is type of Observational cross sectional study.

Inclusion and Exclusion Criteria

Inclusion criteria: Patients presenting with upper gastrointestinal bleeding during study period.

Exclusion criteria: Patients presented with Lower GIT bleeding and with superficial mucosal bleeding.

Data Collection

All patients with UGIT bleeding underwent detailed history taking, complete blood count, liver function test,kidney function test, PT-INR, HBsAg, Anti-HCV, Anti-HIV, USG abdomen and UGIT Endoscopy. Above scoring system applied to all patients presented with UGIT bleeding and score calculated. Patients followed at 1 month and 3 month to look for Rebleeding, any Intervention and mortality.

Statistical Analysis

We compared each scores ability to predict the pre-determined outcomes. In addition, the performance of the scores was assessed by calculation of sensitivity, specificity, positive predictive value and negative predictive value. Data entered in Microsoft excel and Data analysis was done using software SPSS trial version 20.

RESULT

A total of 80 patients were included in the study. All of them followed up at 1 month and 3 month. Table no. 1 shows the patients' characteristics, symptoms, Rebleeding, mortality at 1 month and 3 month. Table no.1 also shows mean score of each scoring system.

Table No. 1.

Parameter	Frequency (n=80)
Age (mean)	45.10 + 14.46
Gender	
Male	62
Female	18
Weight in kg(mean)	53.43 + 12.17
Height in cm (mean)	157.25 + 13.09
BMI	21.35 + 4.7
Pulse (mean)	92.37 + 15.68
Mean systolic BP	104.68 + 16.47
Haemoglobin (mean)	7.91 + 2.29
Sr. Albumin (mean)	3.24 + 0.40
BUN (mean)	25.69 + 21.89
PT-INR (mean)	1.48 + 1.96
History of	
Haematemesis	72
Malena	43
Syncope	13
Alcoholism	38
Altered sensorium	01
Hepatic disease	10
Rebleeding	
At 1 Month	03
At 3 Months	07
Mortality	
At 1 month	00
At 3 Month	05
Mean Score	
Glasgow Blatchford	8.98 + 4.78
Full Rockall	2.58 + 1.87
AIMS 65	0.75 + 0.88
PNED	1.30 + 1.57

Table No. 2 shows Endoscopic Diagnosis of the Patients, the most common endoscopic diagnosis was Duodenal ulcer.

Table No. 2.

Endoscopic diagnosis	
Ampullary bleeding	1
Dilated vascular channels	1
DU	21
DU & GU	1
Gastric carcinoma	4
Gastric GIST	1
GEJ tumour	1
GEJ ulcer	1
GERD Gr.C	3
GERD Gr. D	2
GERD Grade-B, post GJ status	1
GU	14
LOV	16
LOV & Large GOV1	1
LOV, small GOV1 & GOV2	2
LOV, Large GOV1 & GOV2	1
Mallory weiss tear	1
NORMAL STUDY	2
SOV & Ampullary bleeding	1
SOV & Large GOV 1	4
SOV, Large GOV1 and GOV2	1

Table No. 3 shows usefulness of GBS score for predicting mortality with sensitivity of 100%

Table No. 3: Use of GBS Score for Mortality.

GBS Score	Mortality		Total
	Yes	No	
Positive (>0)	5	75	**80**
Negative (<0)	0	0	**0**
Total	**5**	**75**	**80**

Sensitivity= 100%

Table No.4 Shows usefulness of GBS score for predicting need of intervention with sensitivity of 100%.

Table No. 4: Use of GBS Score for Need of Intervention.

GBS Score	Need of Intervention AT 3 Month		Total
	YES	NO	
Positive (>0)	7	73	**80**
Negative (<0)	0	0	**0**
Total	**7**	**73**	**80**

Sensitivity= 100%

Table no. 5 shows Usefulness of Full Rockall scoring system for predicting mortality with Sensitivity of 80%, Specificity of 72%, PPV of 16%, NPV of 98.18%.

Table No. 5: Use of Full Rockall Score for Mortality.

Fra Score	Mortality		Total
	Yes	No	
Positive (>3)	4	21	**25**
Negative (0-3)	1	54	**55**
Total	**5**	**75**	**80**

Sensitivity= 80%
Specificity= 72%
PPV= 16%
NPV= 98.18%

Table no. 6 shows Usefulness of Full Rockall scoring system for predicting need of intervention with Sensitivity of 85.71 %, Specificity of 73.97 %, PPV of 24 %, NPV of 98.18%.

Table No. 6: Use of Full Rockall Score for Need of Intervention.

Fra Score	Need of Intervention at 3 Month		Total
	Yes	No	
Positive (>3)	6	19	**25**
Negative (0-3)	1	54	**55**
Total	**7**	**73**	**80**

Sensitivity= 85.71%
Specificity= 73.97
PPV= 24%
NPV= 98.18
Table no. 7 shows Usefulness of AIMS 65 scoring system for predicting mortality with Sensitivity of 80 %, Specificity of 94.66 %, PPV of 50 %, NPV of 98.61 %.

Table No. 7: USE of Aims 65 Score for Mortality.

Aims 65 Score	Mortality		Total
	Yes	No	
Positive (>2)	4	4	**8**
Negative (<2)	1	71	**72**
Total	**5**	**75**	**80**

Sensitivity= 80.00%
Specificity= 94.66%
PPV= 50%
NPV= 98.61%

Table no. 8 shows Usefulness of AIMS 65 scoring system for predicting need of intervention with Sensitivity of 85.71 %, Specificity of 94.52 %, PPV of 60 %, NPV of 98.57 %.

Table No. 8: Use of AIMS 65 Score for Need of Intervention.

AIMS65 Score	Need of Intervention AT 3 Month		Total
	YES	NO	
Positive (>2)	6	4	**10**
Negative (<2)	1	69	**70**
Total	**7**	**73**	**79**

Sensitivity= 85.71%
Specificity= 94.52%
PPV= 60%
NPV= 98.57%

Table No. 9 shows Usefulness of PNED scoring system for predicting mortality with Sensitivity of 60 %, Specificity of 94.66 %, PPV of 42.85 %, NPV of 97.2 %.

Table No. 9: Use of Pned Score for Mortality.

Pned Score	Mortality		Total
	Yes	No	
Positive (>3)	3	4	**7**
Negative (0-3)	2	71	**73**
Total	**5**	**75**	**80**

Sensitivity= 60%
Specificity= 94.66%
PPV=42.85%
NPV= 97.2

Table no. 10 shows Usefulness of PNED scoring system for predicting need of intervention with Sensitivity of 85.71 %, Specificity of 93.15 %, PPV of 54.54 %, NPV of 98.55 %.

Table No. 10: Use of Pned Score for Need of Intervention.

Pned Score	Need of Intervention AT 3 Month		Total
	Yes	No	
Positive (>3)	6	5	**11**
Negative (0-3)	1	68	**69**
Total	**7**	**73**	**80**

Sensitivity= 85.71 %
Specificity= 93.15 %
PPV= 54.54 %

DISCUSSION

Total 80 patients were included in our study presented with UGIT bleeding. Out of which 62 were male and 18 were females.

The mean age was 45.10 + 14.46. Mean weight in kg was 53.43 + 12.17. Mean height in cm was 157.25 + 13.09. Mean pulse rate was 92.37 + 15.68. Mean systolic BP was 104.68 + 16.47.

Total 72 patients were presented with haematemesis, 43 patients were presented with malena, 13 patients had syncope, 38 patients had H/o Alcoholism, 10 patients had hepatic disease, 1 patient had altered sensorium.

Mean Hb in gm% was 7.91 + 2.29. Mean Sr.albumin in gm/dl was 3.24 + 0.40, Mean BUN in mg/dl was 25.69 + 21.89.

3 patients at 1 month and 7 patients at 3 month had Rebleeding. No patients had died at 1 month and 5 patients were died at 3 month.

Mean GBS score was 8.98 + 4.78. Mean Full Rockall was 2.58 + 1.87.Mean AIMS 65 was 0.75 + 0.88. Mean PNED score was 1.30 + 1.57.

Most common endoscopic diagnosis was Duodenal ulcer which is followed by Large esophageal varices which is followed by Gastric ulcer.

This is cross sectional observational study shows that the Glasgow Blatchford score is an accurate risk score for predicting need for clinical intervention or death after upper gastrointestinal bleeding with sensitivity for both is 100 %.

Next accurate score for predicting need of intervention and mortality is full Rockall score with sensitivity of 80% and 85.71% respectively but less sensitive as compared to GBS score.

AIMS 65 scoring system had almost same sensitivity as full rockall score for predicting need of intervention and mortality but it is more specific for predicting need of intervention and mortality when compared to full rockall scores. PNED score is more sensitive for predicting need of intervention but less sensitive for predicting mortality.

Recent single centre retrospective study from Australia of 424 patients with upper gastrointestinal bleeding compared all these scores apart from PNED.[31] The researchers reported that the AIMS65 score was best at predicting mortality which is comparable to our study, although lower than other smaller studies.[16,19,29] They also found that AIMS65, Glasgow Blatchford, and full Rockall scores were similar at predicting their composite endpoint, which unlike our study.

We identified a Glasgow Blatchford score of 0 as the optimum score threshold to identify patients who would not require intervention or die, with a sensitivity of 100 %. Some authors, however, have suggested that this low risk threshold could be extended to 1 or less or to 2 or less.[13,14,22] But in our study GBS score of 0 is cut off for low and high risk patient.

By assessing the five pre-endoscopy scores that appeared most promising for clinical use, we could investigate the optimum way to risk assess patients with upper gastrointestinal bleeding, both early after presentation and after endoscopic diagnosis and treatment. Use of an accurate score within emergency departments or acute assessment units, to identify very low risk patients with upper gastrointestinal bleeding not requiring admission has clear benefits.

An observational study suggested that patients with a Glasgow Blatchford score greater than 12 have decreased mortality if endoscopy is undertaken less than 13 hours after presentation. Our data suggest that a Glasgow Blatchford score of 0 or more and AIMS65 score of 2 or more have the highest combination of sensitivity and specificity for predicting intervention or mortality.

GBS score of 0 or more than 0 had sensitivity of 100%, so cut off value of 0 to differentiate between low risk and high risk patient is validated in our study. Full rockall score greater than 3 had high sensitivity in our study for predicting need of intervention and mortality. AIMS65 score more than 2 had high sensitivity for predicting need of intervention and mortality in our study but PNED score more than 3 had low sensitivity in predicting mortality in our study.

CONCLUSION

The Glasgow Blatchford score is accurate at predicting need for intervention or mortality in patients with upper gastrointestinal bleeding. A score of more than 0 is the optimum threshold for identifying very high risk patients suitable for intervention. AIMS65 score of 2 or more are best at predicting mortality but less sensitive as compared to GBS score. Full rockall score more than 3 is also accurate in predicting mortality but less sensitive as compared to GBS score. PNED score more than 3 had least sensitive for predicting mortality among all scoring system.

CONFLICTS OF INTEREST

No any conflict of interest.

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