A Prospective study of the Glasgow-Blatchford score performance in predicting clinical outcomes in patients with upper GI bleeding, in rural India

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Abstract

Introduction: Many patients present to the emergency department with varying grades of UGI bleed, so deciding whether a patient requires emergency endoscopy or managed on out patient basis is a challenging decision. The Glasgow-Blatchford Score (GBS) is an easy score to calculate and identifies patients who are a high risk. **Methods:** This was a prospective study. The data of adult patients presenting with upper GI bleeding were included in this study. A GBS was calculated for each patient based on clinical or laboratory variables at the time of presentation. The outcome of the patient was observed, and patients were divided in two groups i.e. high and low risk.Univariate analysis was performed to compare these two groups. **Results**: Total 86 patients with UGI bleeding were included in the study. Amongst them 88% were males and 12% females. Out of 86 patients, 38 patients were included in low risk group, and 48 patients were in high-risk group Mean Glasgow Blatchford Scoring scores were 5.94 for 38 low-risk subjects and 10.16 for 48 high-risk patients. The sensitivity and specificity were 100% and 36.82% respectively, for a cut-off value of GBS score > 3, 95.83% and 63.15% for a cut-off value of GBS score >5, and 91.66% and 73.68% for a cut-off value of GBS >7. **Conclusion:** The Glasgow-Blatchford score is based on simple clinical and laboratory variables, which helps in risk stratification [High risk / low risk] of the patients presenting with upper GI bleed, in the emergency department.

Keywords: Glasgow-Blatchford score, Upper GI bleeding. Rural India

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Introduction

The upper gastrointestinal bleeding remains one of the frequent causes of emergency hospitalization [1]. It can be caused by a wide spectrum of pathologies, some of which carry clinically significant morbidity and mortality. Upper gastrointestinal (UGI) bleeding, which accounts for 85% of all gastrointestinal bleeding cases, originates from the proximity of the Treitz ligament and it represents an important clinical and economic problem.

Its management has been transformed in recent years by use of proton pump inhibitors and secondly, the upper GI endoscopy. Upper GI endoscopy plays an important

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role not only in diagnosis but also in treatment and prognosis of patients with upper GI bleed.

The patients present to the emergency department with varying grades of for urgent endoscopy may be unnecessary and can prove to be costly and inefficient.

[2] Faced with these realities, it was essential to develop tools for early assessment of the severity of gastrointestinal bleeding and stratification of patients before performing endoscopy.

A number of risk scoring systems exist to predict clinical outcomes in patients with UGIB.

The most recent of these is the Glasgow-Blatchford score [3].

The Glasgow-Blatchford Score (GBS) is easy to calculate and it is based on clinical and laboratory variables and score identifies patients who are a high risk of using a therapeutic procedure (interventional endoscopy, surgery and / or transfusions).

Some studies have shown sensitivity 100 % for GBS score of 3 and sensitivity of 100 % at GBS cutoff value of 0 [2]. Thus we planned this study to validate Glasgow Blatchford scoring in patients with upper GI bleeding.

Material and Methods

This study was conducted for period of 1 year, in department of surgery, government Medical College, Miraj.

This was a retrospective study.
The data of adult patients presented with upper gastrointestinal bleeding were included in this study.

Ethical board permission was taken. UGIB was defined as presenting symptoms of hematemesis, coffee ground vomiting, and/or melena.

We excluded pregnant patients and traumatic patients.

The following data were obtained from identified patients and recorded:

age, sex, symptoms (hematemesis, melena, hematochezia, and syncope), alcohol use, past medical history (congestive heart failure, liver failure/ cirrhosis etc.),

vital signs, need for blood transfusion, examination findings on presentation, laboratory studies (blood urea, hemoglobin (Hb), prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR) levels), endoscopic findings, endoscopic therapy, and outcomes.

A GBS was calculated for each patient based on clinical or laboratory variables at the time of presentation, as shown in Table-1.

Moreover, the patients were classified in two groups as high-risk (patients who received blood transfusion, required endoscopic intervention or operation, or died) and low-risk patients (patients who do not show any of the high-risk criteria).

Univariate analysis was performed to compare these two groups then the ROC curve was used to identify the 'cut off point' of the SGB.

Sensitivity (Se), specificity (Sp), positive predictive value (PPV) and negative predictive value (NPV) with confidence interval of 95% were calculated.

Table-1: Glasgow Blatchford score

Variable	Score
Blood urea (mmol/L)	
6.5–7.9	2
8.0–9.9	3
10.0–25.0	4
> 25.0	6
HgB for men (g/L)	
120–129	1
100–119	3
< 100	6
HgB for women (g/L)	
100–119	1
< 100	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
< 90	3
Other markers	
Pulse ≥ 100/min	1
Presentation with melena	1
Presentation with syncope	2
Hepatic disease	2
Cardiac failure	2

Results

A total of 86 patients with upper gastrointestinal system bleeding were included in this study. Out of this 86 patients 76 (88%) were males and 10(12%) were females. The mean age of the patients in our study was 45 years; all patients were admitted in emergency surgical department, 58% were discharged, 23% patients were referred and 18.6% patients died in our study. F ig2

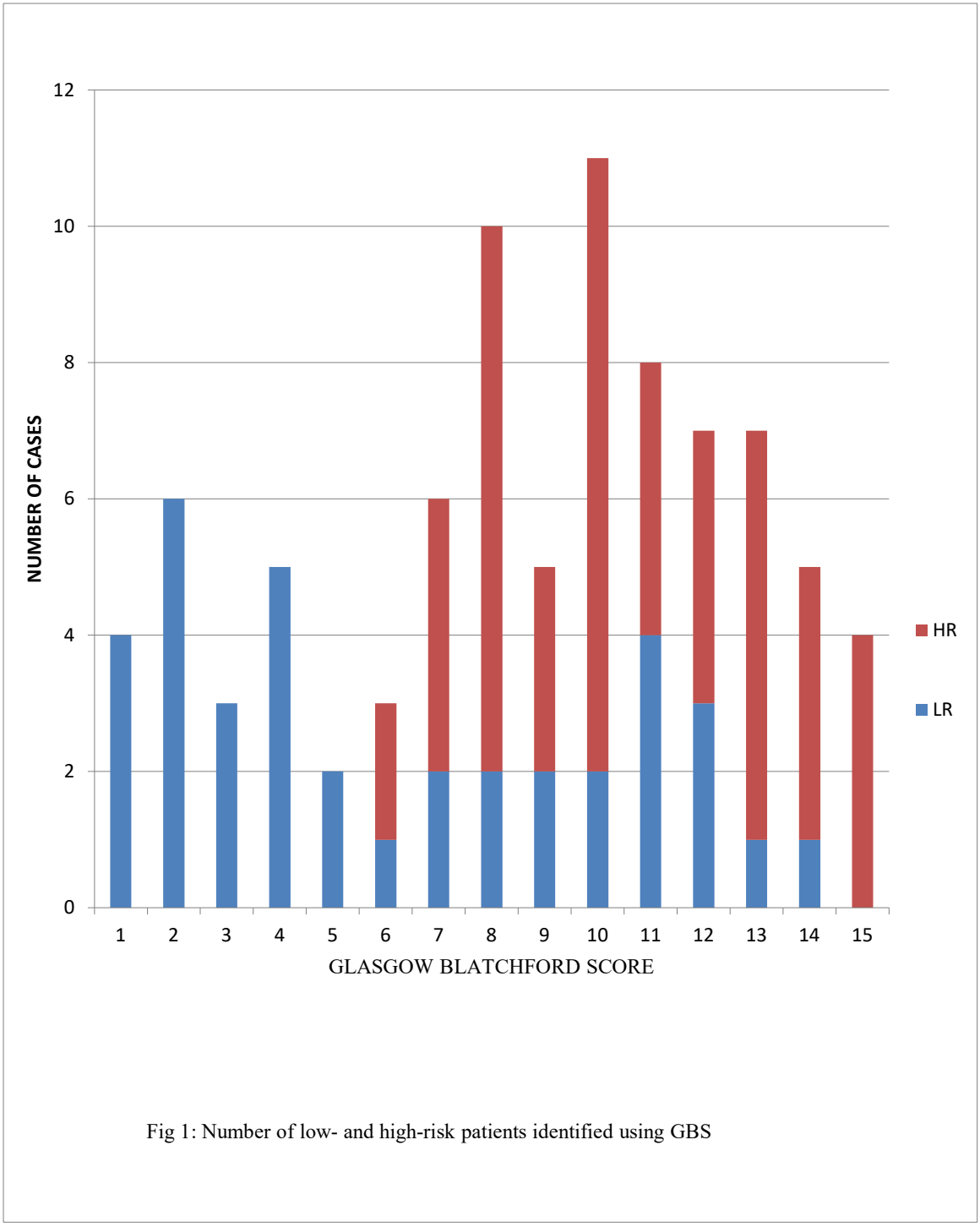

Fig 1: Number of low- and high-risk patients identified using GBS

In total, 38 patients were included in low risk group, and 48 patients were in high risk group (blood transfusion and/or therapeutic intervention).

Mean Glasgow Blatchford Scoring scores were 5.94 for 38 low-risk subjects and 10.16 for 48 high-risk patients.

The number of low and high-risk patients identified using GBS is shown in Fig 1.

Table 2: Evaluation of performance of the GBS system

GBS cut off	>3	>5	>7
sen	100	95.83333	91.66667
spec	36.84211	63.15789	73.68421
ppv	66.66667	76.66667	81.48148
npv	100	92.30769	87.5
DA	83.72093	69.76744	62.7907

When the performance of the GBS system was evaluated in the determination of high risk, the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy were calculate for GBS score cut off value of >3,>5,>7 as shown in table 2.

The sensitivity and specificity were 100% and 36.82%, respectively, for a cut-off value of GBS >0, 100% and 16.9% for a cut-off value of GBS >3, 95.83% and 63.15% for a cut-off value of GBS >5, and 91.66% and 73.68% for a cut-off value of GBS >7. A GBS cutoff value of 5 had 20 patients and all were in low risk group, if we opt for medical treatment, at the risk of being wrong is in 8% of cases.

The rate of admission and workload could decrease by almost 24.41% at this cutoff value.

Discussion

There are several risk-scoring systems to assess the patients presenting with upper gastrointestinal hemorrhage. Most scoring systems require endoscopic findings for scoring the patients, including the commonly used Rockall score, which was introduced to assess the risk of death following UGIH. [4] An admission Rockallscore that excludes the endoscopic parameters is sometimes used, however, it has not been fully validated.

The Glasgow Blatchford Score (GBS) appears to be accurate in identifying patients at risk of requiring hospital-based intervention or death following UGIH.

This score does not require endoscopy and is based on simple clinical and laboratory parameters which are available soon after the patient presents to the Emergency department.

Our results confirm that GBS is an excellent tool for assessing the severity of upper gastrointestinal bleeding. This score also allows predicting the cases in which a therapeutic procedure would be necessary. The score was developed by the team Blatchford using data from 1748 patients, hospitalized for upper GI bleeding using a logistic regression model [3].

This is a very easy to calculate since it is based on clinical and biological criteria that can be collected from the examination of the patient to score emergencies.

GBS takes into account the rate of uremia. Several studies have demonstrated that uremia was an important marker of the abundance of upper gastrointestinal bleeding [5,6,]. Increased uremia is explained by two mechanisms: on one side and hypovolemia renal hypoperfusion and another side intestinal digestion of hemoglobin [7]. GBS has another advantage over the Rockall score and the Baylor because it does not include in its calculation the result of upper gastrointestinal endoscopy.

This allows selecting patients in whom endoscopy should be performed urgently within 24 hours.

In the retrospective study performed by Chen et al. [8] in patients with non variceal UGI system bleeding, GBS and Rockall scoring systems were compared, and the sensitivity of the GBS system in the differentiation of high-risk patients for a cut-off value of GBS >0 was found to be higher (99.6%).

Similarly, in our retrospective study, which included the patients with both variceal and nonvariceal bleeding, the sensitivity of the GBS system was found to be high (100%) in the differentiation of high-risk patients for a cut-off value of GBS >3. In our study, the number of the subjects with UGI system bleeding with a GBS score ≤3 was 13 (15.11%) and, in this group of patients, none of the patients that underwent endoscopy showed a serious pathology or required an intervention during the endoscopy.

Thus, in our study, it was demonstrated that the patients with UGI system bleeding, who had a GBS score ≤3, did not require clinical and endoscopic intervention and could be safely discharged.

While the retrospective study performed by Srirajaskanthan et al [9] revealed a cut-off value of GBS ≤2 in the differentiation of low-risk patients among the patients with UGI system bleeding, other studies [3,8,10] used GBS=0 in the differentiation of the low-risk patients.

An ideal scoring system should have both a good sensitivity and high specificity. In our study, the sensitivity and specificity were 100% and 36.84 % for a cut-off value of GBS >3, 95.83% and 63.15 % for a cut-off value of GBS >5, and 91.66% and 73.68 % for a cut-off value of GBS >8. However, in the studies conducted, the sensitivity and specificity of the GBS system vary among high-risk patients with UGI system bleeding [8,9,11].

In the study performed by Chen et al. [8], positive predictiveValue (PPV) and negative predictive value (NPV) for GBS >0 were 75.2% and 96.4%, respectively. In the study conducted by Farooq et al. [11], PPV and NPV were 37% and 100%, respectively for GBS >0 and 42% and 82% for GBS >5. In our study, PPV and NPV for GBS >3 were 66% and 100% and for GBS >5 were 76.6% and 92.3% respectively.

The limitations of this study include that it was a retrospective study and performed at a single center. The number of patients was small, and all the patients did not undergo an endoscopy. Although in the

literature, there has been no consensus on the best scoring system in various studies performed using the Rockall scoring system and/or the GBS system, the GBS system seems to be more useful, especially in patients with non-variceal UGI system bleeding.

In our study, which included all the patients with variceal and non-variceal UGI system bleeding, we used the GBS system, and found it useful in the differentiation of high-risk patients. Future studies that contain more patients, multi-centered, and that follow the patients after discharge is required.

From our study we can suggest that GBS score <3 may safely be discharged, and scores >= 4 may require observation and if required endoscopy. We may be able to reduce workload on emergency endoscopy procedure by almost 24% if we use GBS score cutoff value of 5.

Conclusion

GBS is an easy scoring system based on clinical and laboratory variables only, without a need for endoscopy, and thereby, it can be easily used in emergency conditions to identify high and low risk groups of patients.

The GBS also has the potential to decrease the number of admissions to hospital, thus rendering resource use more rational.

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