

Original Article

Validation of Glasgow-Blatchford Score in Predicting Management of Upper Gastrointestinal Bleeding

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Background : Upper Gastrointestinal Bleeding is a common emergency with varying degrees of severity. Haemorrhage is managed by Therapeutic Endoscopy, Radiological Intervention or Surgery and Blood Transfusion which are available only in Tertiary Care Centre. So, when patient presents in primary healthcare setting, it is important to recognize the patients who need this treatment. Glasgow-Blatchford Score is a score which is used for this purpose. The purpose of this research was to validate its reliability in identifying such high-risk patients.

Materials and Methods : This study was prospective and observational, conducted in Medical College and Hospital, from December, 2017 to May, 2019. All adult patients presenting to Emergency Department with sudden onset Upper Gastrointestinal Bleeding were included. Glasgow-Blatchford Score was computed. Patients were followed up till their discharge (or death) from the hospital. The therapeutic management needed and its relationship with the score and treatment modalities were noted. Area under Receiver Operating Characteristic (ROC) Curve was calculated.

Results : Total 100 patients were included in study. 85% were male and 15% were female. Glasgow-Blatchford Score was found as a good predictor in discriminating patients. Patients with score 14. Interventional radiology or surgery was never used. The area under ROC Curve was 0.738 suggesting fair reliability.

Conclusion : Glasgow-Blatchford Score is good predicting tool in cases of Upper Gastrointestinal bleeding and patients with score ≥ 7 should be transferred to speciality centres.

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Key words : Upper Gastrointestinal Bleeding, Glasgow-Blatchford Score.

Any bleeding from a site proximal to the ligament of Treitz in Gastrointestinal Tract is defined as Upper Gastrointestinal Bleeding (UGIB). Hematemesis, Malena, Syncope, Epigastric Pain, Dysphagia, Dyspepsia, Weight Loss, Diffuse Abdominal Pain and Jaundice are the signs and symptoms of acute UGIB. Ulcers in the Gastrointestinal Tract such as Erosion or bleeding Ulcers may lead to Upper Gastrointestinal Bleeding. Rupture of the blood vessels like a Variceal Rupture in the esophagus, fundus and gastric cardia or Mallory-Weiss tear in distal Esophagus are the other causes for Upper Gastrointestinal Bleeding. Carcinoma of the Esophagus, Stomach and Duodenum can also cause UGIB.

Among 100,000 population per year approximately 100 cases present with UGIB¹. UGIB is approximately 4 times as common as bleeding from the Lower GI

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Editor's Comment :

- Patients presenting with Upper GI bleeding having Glasgow Blatchford Score of 7 or more than 7, should be transferred to higher center for further superspeciality care. This will reduce morbidity and mortality related to upper GI bleeding cases.

Tract and causes significant morbidity and mortality. Mortality rate is around 6-10% for UGIB². In 98.3% of mortalities in UGIB patients, one or more comorbid illnesses were noted³. In 72.3% of patients, primary cause of death was comorbid illnesses.

Glasgow Blatchford Score helps to assess whether a patient with acute UGIB will need medical intervention such as Endoscopic Intervention or Blood Transfusion. This score is also useful to recognize patients who don't need admission to the hospital after UGIB. The validity of this score in present settings will be assessed.

Patients with Haematemesis are resuscitated and stabilized immediately after admission to the hospital. Blood and blood components are transfused if necessary and proton pump inhibitors, vasopressin or its analogues and somatostatin or its analogues are given to start initial treatment.

First-line diagnostic modality and treatment option for UGIB is Endoscopy. It is an important early intervention that is used to recognize the source of bleeding. Endoscopy can also be used for Therapeutic Interventions⁴. However, findings can be non-diagnostic in about 10% of cases. For example, in a case of massive UGIB, Endoscopy may not be helpful because intraluminal blood cannot be adequately cleared.

Early Upper GI Endoscopy is recommended within 24 hours of presentation in majority patients. This is useful to confirm the diagnosis and it also allows for targeted Endoscopic management like epinephrine injection, thermo-coagulation, clips application and variceal banding⁴.

Endoscopic therapy is useful to bring down morbidity rate, risk of recurrent bleeding and hospital stay. It also reduces the need for surgery to tackle with active Upper Gastrointestinal Bleeding. In spite of successful endoscopic therapy, 10 to 20 percent of patients can present with rebleeding⁵; For such patients a second setting of endoscopic procedure is required.

Transjugular Intrahepatic Portosystemic Shunt (TIPS) which is one of the interventional radiological procedure can be indicated in some patients of Upper GI Bleeding. If there is persistent and severe bleeding then Arteriography with embolization or surgery may be needed. Surgery is useful for uncontrolled bleeding from Peptic Ulcer.

However, at Primary Health Care Centre, this advanced modalities are not available. So, GBS is a screening tool to assess whether a patient with acute UGIB will need medical intervention such as endoscopy or blood transfusion. Advantages of the GBS over the Rockall score, which is useful to assess mortality risk in patients with UGIB, includes lack of need for Oesophago Gastro Duodenoscopy (OGD) and the lack of subjective variables like the severity of systemic diseases to complete the score, which is a feature unique to the GBS.

MATERIALS AND METHODS

This study was done at Medical College and Hospital, after taking approval of the Institutional Ethics Committee during a period of 1 year and 6 months (December, 2017 to May, 2019). This was prospective, observational, descriptive study including 100 patients with age more than 18 years who were presenting in emergency services with chief complaints of having Acute Hematemesis or Malena. Repeated Hematemesis cases that were diagnosed earlier and managed were also involved in the study. All the

patients were included in study after taking informed consent. Patients who were presented electively for management of Upper GI bleeding with past history of Hematemesis or Malena were excluded from study.

A thorough history and detailed clinical examination was carried out. All patients were subjected to the biochemical investigations. The patients were simultaneously resuscitated, stabilized and if required blood and blood products transfusion was done. Once stable, Upper Gastrointestinal Endoscopy was carried out for diagnosis and for therapeutic purpose. Endoscopic therapeutic intervention was performed in same setting if indicated. Interventional radiology and surgery were other options available if needed.

Patients were followed till discharge or death in hospital. Glasgow Blatchford Score (GBS) was computed for every patient (Table 1). Outcome was measured in the form of need for blood transfusion, need for Therapeutic Endoscopy, surgical procedure and any other procedure by interventional radiology and in hospital mortality.

Data was tabulated in Microsoft excel spreadsheet (Version office 8).

Table 1 — Showing Glasgow Blatchford Score (GBS)	
Admission Risk Marker	Score Component Value
Blood Urea (mmol/L) :	
>25	6
10.0-25	4
8.0-10.0	3
6.5-8.0	2
Haemoglobin(g/L) for Men :	
<10.0	6
10.0-11.9	3
12.0-12.9	1
Haemoglobin(g/L) for Women :	
<10.0	6
10.0-11.9	1
Systolic Blood Pressure (mm Hg) :	
<90	3
90-99	2
100-109	1
Other markers :	
Hepatic Disease	2
Cardiac Failure	2
Presentation with syncope	2
Pulse > 100 (per min)	1
Presentation with Malena	1
The score is equal to "0" if all of the following are present:	
<ul style="list-style-type: none"> • Hemoglobin level >12.9 g/dL (men) or >11.9 g/dL (women) • Blood urea nitrogen level <6.5 mg/dL • Pulse <100/minute • Systolic BP >109 mm Hg • No Melena or syncope • No past or present Liver Disease or Heart Failure 	
• Interpretation of Score:	
<0: Minimal risk of needing an intervention	
>0: Higher risk of needing an intervention	
6 or >6: More than 50% risk of needing an intervention	

Statistical Analysis : Statistical Package for Social Sciences for Windows, version 16 (SPSS Inc, Chicago, IL, USA) was used for data analysis. To study association between categorical variables Chi-square test was used. Chi-square test for trend was used for ordinal data. ANOVA was used to compare means. Numerical data was shown as mean \pm standard Deviation. T-test was used to compare numerical data. Receiver Operating Characteristic (ROC) Curve was plotted. After that Area Under Curve (AUROC) was computed. AUROC between 0.7 to 0.8 was considered fairly reliable for validity of GBS score. P value <0.05 was considered significant.

RESULTS

In our study, total 100 patients were included. The age group in this study varied from 19 years to 95 years with the mean age of 45.9 years with male preponderance as 85% patients were male. 49% patients presented with hematemesis and Malena and 51% patients presented with Hematemesis alone. 31% patients had recurrent episode of Hematemesis. 70% patients were Alcoholic and 9% patients were having addiction of Smoking. 15% patients had tachycardia with pulse more than 100/min. Mean pulse value was 92.9 ± 11.84 per minute. 16% patients presented in shock with systolic BP less than 90 mmHg. Mean Systolic BP was 108.32 ± 14.80 mmHg. 67% of patients required blood transfusion. Out of 100 patients, 95% patients underwent Endoscopy and 5% patients could never be Stabilised and Endoscopy could not be performed. On Endoscopy, 68% patients showed Variceal bleeding, 14% patients had Mallory Weiss tear and 5% patients had Peptic Ulcer Disease. 2% patients showed normal study on Endoscopy. 68% of the patients who were having Variceal bleeding, underwent Endoscopic band ligation for oesophageal varices. Remaining 32% of patients were managed conservatively with medications. No surgery was done and neither interventional radiological procedure was done for management of UGIB. Mortality rate in our study was 5%. GBS score ranged from 3 to 18 with mean value of 12.03 ± 2.58 .

Patients are divided into 4 groups (Table 2) with respect to GBS Score values as <7 , 7-10, 11-14 and >14 and the percentage of patients needing a Blood Transfusion and percentage of patients needing Therapeutic Endoscopy was calculated and the graph was plotted. Both the graphs also show that as the GBS score increases, the need for Blood Transfusion (Fig 1) and Therapeutic Endoscopy (Fig 2) also increases.

GBS Score	No of Patients	No of patients having Blood Transfusion	No of patients undergone Therapeutic Endoscopy
<7	6	0 (0%)	0 (0%)
7 -10	11	5 (45.45%)	3 (27.27%)
11-14	73	52 (71.23%)	55 (75.34%)
>14	10	10 (100%)	100 %

ROC Curve for GBS Score :

Area under the curve for GBS Score found to be 0.738 with standard error of 0.058. With 95% confidence interval, lower bound value was 0.624 and upper bound value was 0.852.

DISCUSSION

The results indicate that GBS is a fairly good predictor in identifying patients needing referral to specialised centres. Patients with score <7 did not need transfusion or Therapeutic Intervention, when the score was between 7 and 10, 45% needed blood transfusion and 27% needed Therapeutic Endoscopy which further increased to 71% and 75% respectively when score was between 11-14 and 100% when more than 14. 2 patients with score 13 and 3 patients with score 14 succumbed to death. Interventional radiology

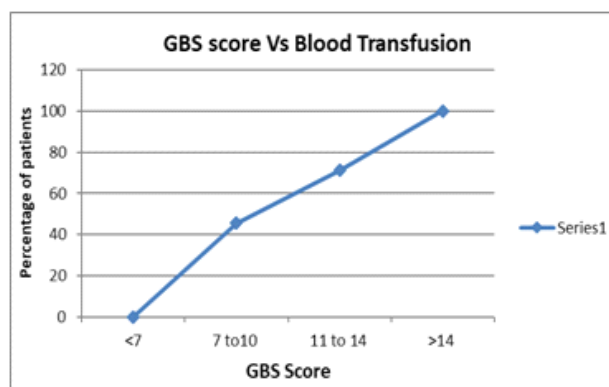


Fig 1 — GBS Score versus Blood Transfusion

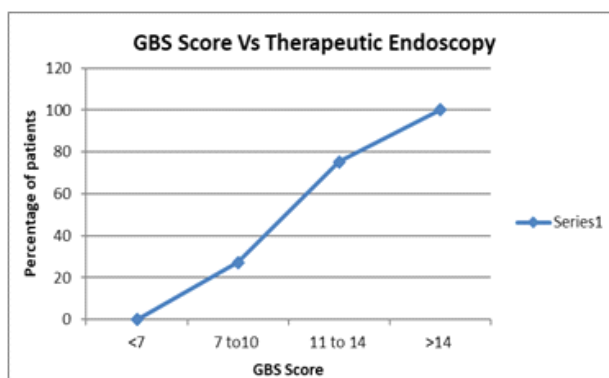


Fig 2 — GBS Score versus Therapeutic Endoscopy

or surgery was not used in any patient. The area under ROC Curve was 0.738 suggesting fair reliability.

Our findings are similar to the study done by Stevenson, *et al*⁶, in which patient with GBS Score less than 6 do not require blood product transfusion. Emergency Endoscopy was done in 86% of patients with GBS score of >6.

In study done by Blatchford O, *et al*⁷, the Area Under Curve for ROC Curve of GBS Score was 0.92 which indicates that GBS Score has very good reliability.

In study done by Chandra, *et al*⁸, in case of overall prognostic accuracy, GBS performed better than pre-endoscopy Rockall Score on ROC Curves analysis (AUC=0.79 *versus* 0.62; P=0.0001; absolute difference, 0.17). The prognostic accuracy of Post-endoscopy Rockall Score and GBS was similarly high (AUC, 0.79 *versus* 0.72; P = 0.26; absolute difference, 0.07).

Study done by Robertson M, *et al*⁹, indicates that in predicting need for ICU admission, AIMS65 Score was superior amongst all other scores. Full-Rockall Scores, GBS and AIMS65 were equivalent (AUROCs 0.63 *versus* 0.62 *versus* 0.63) and for predicting the composite endpoint, all scores were superior to Pre-endoscopy Rockall score (AUROC 0.55). For predicting Blood Transfusion, GBS was superior to all other scores.

Limitations of our study was a small sample size. The place of study being a Tertiary Care Centre, only more complicated patients were referred and only 6% of patients had GBS score <7.

CONCLUSION

Glasgow Blatchford Score was found to be a fairly good predictor for need of Blood Transfusion and/or Therapeutic Endoscopic Intervention in cases of Upper Gastrointestinal Bleeding. It's a simple scoring system that helps a Surgeon or a Physician in any setup to assess requirement for blood transfusion and

therapeutic endoscopy and consider timely transfer to specialised centres if facilities are not available locally.

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