

Diagnostic accuracy of high risk Glasgow Blatchford score and need for endoscopic intervention in upper gastrointestinal bleeding

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Objective: To determine the diagnostic accuracy of high risk Glasgow Blatchford Score (GBS) in investigating the need for endoscopic intervention in upper gastrointestinal bleeding (UGIB).

Methodology: This Cross-section validation study was carried out at Department of Medicine Holy Family Hospital, Rawalpindi, Pakistan from August 1, 2014 till January 31, 2015. Patients with UGIB were stratified according to GBS.

Results: Out of 280 patients, there were 172 (61.4%) males and 108 (38.6%) females. The mean age was 50 yrs (range 16-85yrs). Patients with stigmata of bleeding who underwent intervention were 173 (61.8%) and 107 (38.2%) patients did not have any endoscopic intervention. The median GBS score was 9 (range 0-20). The median GBS score was 11 in patients with

endoscopic intervention and 5 in patients without endoscopic intervention. Patients classified as high risk (GBS \geq 3) for UGIB were 229 (81.8%) and low risk patients (GBS < 3) were 51 (18.2%). The diagnostic accuracy of high risk GBS for identifying patients with UGIB in need for endoscopic intervention is as follows: sensitivity, specificity, positive predictive value, negative predictive value and accuracy rate was computed as 93.64%, 37.38%, 70.74%, 78.43% and 72%, respectively.

Conclusion: The diagnostic accuracy of high risk Glasgow Blatchford Score in determining the need for endoscopic intervention in UGIB is higher while the specificity still needs improvement. (Rawal Med J 2014;41:394-397)

Keywords: Upper gastrointestinal bleeding, endoscopic intervention, Glasgow Blatchford Score.

INTRODUCTION

Upper gastrointestinal bleed is a medical emergency associated with adverse clinical outcomes. It is frequently seen in patients presenting with sequelae of decompensated liver disease.^{1,2} The two commonest causes of UGIB are esophageal varices and peptic ulcer disease.³ Sudden blood loss and circulatory collapse may result in fatal cardiac or cerebrovascular events. Therefore, risk assessment is based on the severity of the hemorrhage and those at high risk of continuing bleeding or re-bleeding need intensive monitoring and early endoscopic intervention, whereas low-risk patients can be discharged from hospital earlier.

Several scoring systems like Rockall score and Glasgow Blatchford Score (GBS) have been devised to identify patients with UGIB, who are at a high risk of adverse outcomes. Rockall score was designed to assist in predicting mortality and risk of re-bleeding following UGIB and requires endoscopy. The GBS aspires to identify patients requiring intervention (endoscopic treatment or surgery) and is based on the clinical and simple laboratory data and does not

rely on endoscopic findings, hence can be used easily in the emergency department. Stanley et al performed a multicenter trial showing GBS was useful in predicting the need for endo-surgical intervention and transfusion.⁴ Farees et al showed that sensitivity of GBS is 100% while the specificity is 2.6%.⁵ At cut-off value of <2 , the GBS identifies patients with a low risk UGIB. When a cut-off value of >3 was used, sensitivity and specificity for identifying high risk bleeds was 100% and 68%.⁶ The rationale of the study was to determine the accuracy of high risk GBS in identifying Pakistani patients who are candidates for urgent endo-surgical intervention in upper GI bleed; we can focus only on the high risk patients.

METHODOLOGY

This Cross-section validation study was carried out at Department of Medicine Holy Family Hospital, Rawalpindi, Pakistan from August 1, 2014 till January 31, 2015, after the approval of ethical committee. Informed written consent was taken. Using WHO calculator, considering a sensitivity of

100% and specificity of 68%, prevalence of 20%, and Confidence Interval of 95%, a sample size of 280 patients was calculated. Non-probability consecutive sampling was done to select patients.

Patients of age >18yr presenting to the Emergency Department with UGIB of any cause (variceal or non-variceal UGIB) were included in the study. Patients with age <18 years and those not admitted through emergency were excluded from the study.

The age and gender of the patients, presence of UGIB was documented on the basis of history (haematemesis, melena) or through NG aspirate and Co-morbidities were noted. Blood pressure and pulse rate taken in ER was recorded. Hemoglobin (Hb), blood urea, LFTS and PT, APTT were collected. GBS of the patients was recorded (Table 1). Patients were admitted to High dependency unit/Intensive care depending upon clinical judgment of patients' condition.

Diagnostic endoscopy of each patient was done in the liver center by the consultants and findings recorded. Patients with active arterial bleeding, non-bleeding visible vessels or an adherent clot underwent variceal banding, vascular clipping or ethanolamine/adrenaline sclerotherapy.⁸

Table 1. Glasgow Blatchford Score.⁷

Blood urea (mmol/L)	
0 point	urea < 6.5
2 points	If 6.5- 8.0
3 points	8.0-9.9
4 points	10.0-25.0
6 points	> 25.0
Hemoglobin (g/dl)	
(In men):0 point	> 13
1 point	12.0-12.9
3 points	10.0-11.9
6 points	< 10.0
(In women): 1point	10.0-11.9
6 points	<10.0
Systolic blood pressure (mm Hg):	
1 point	100-109
2 points	90-99
3 points	< 90
Pulse: 1 point	>/= 100/min
Melena: 1 point	If+
Others: 2 points	If the patient has syncope; hepatic disease (documented history of prior liver disease or with evidence of liver dysfunction (deranged LFTS, INR>1.2, serum albumin <3.0); cardiac failure (prior echo with EF<45 %).

Low risk group: GBS of 0-2. High risk group: GBS of >/= 3.

Results were analyzed using SPSS (v.12.0). Sensitivity, specificity, positive predictive value and negative predictive value for GBS >3 were calculated. Sensitivity is the ability of GBS to identify the patients presenting with UGIB, who need endoscopic intervention. Specificity is defined as the ability of GBS to identify patients presenting with UGIB who don't need endoscopic intervention. Positive Prediction Value is the probability of individuals presenting with UGIB to undergo endoscopic intervention if the GB scores are > 3. Negative Prediction Value is the probability of individuals presenting with UGIB to undergo endoscopic intervention if the GB scores are <3.

RESULTS

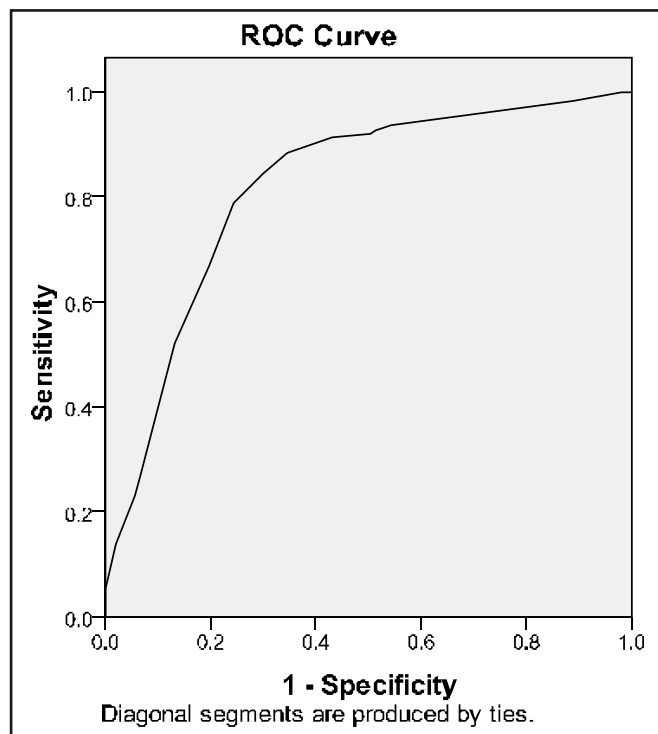
Out of 280 patients, there were 172 (61.4%) males and 108 (38.6%) females. The mean age was 50yrs (range 16-85yrs). Patients with stigmata of bleeding who underwent intervention were 173 (61.8%) and 107 (38.2%) did not have any endoscopic intervention. Variceal bleeding and gastropathy were commonest causes (Table 2).

Table 2. Endoscopic findings of patients presenting with UGIB.

Stigmata of bleeding	Number	%
Variceal Bleed	144	51.4%
Congestive Gastropathy	46	16.4%
Varices + Congestive Gastropathy	25	8.9%
Ulcer Bleed	03	1.1%
Gastritis	47	16.8%
Normal	15	5.4%
Total	280	

Over all, median GBS score was 9 (range 0-20). The median GBS score was 11 in patients with endoscopic intervention and 5 in patients without endoscopic intervention. Patients classified as high risk (GB Score >3) for UGIB were 229 (81.8%) and low risk patients (GB Score <3) were 51 (18.2%).

Fig. 1. ROC Curve for diagnostic accuracy of GBS score in predicting need for endoscopic intervention.



The diagnostic accuracy of GB score for identifying patients with high risk stigmata of UGIB and consequent requirement of interventional endoscopy is as follows (Table 3).

Table 3. Risk assessment in predicting need for UGIB.

Risk	Endoscopic Intervention	No Endoscopic Intervention
High Risk (3-11)	(TP) 162	(FP) 67
Low Risk (0-2)	(FN) 11	(TN) 40

GBS sensitivity was 93.64%, specificity 37.38%, PPV 70.74% and NPV 78.43% with diagnostic accuracy of 72%. Fig. 1 shows the ROC.

DISCUSSION

Patients with UGIB are mostly evaluated on the basis of clinical decision of the emergency physician. Risk scoring systems are not used commonly in daily practice in the emergency department (ED). More objective criteria are required for decision making regarding discharge/hospitalization, blood transfusion and determining the need for emergent endoscopy. GBS

scores is easily calculated with clinical and laboratory variables and is found to be suitable for use in the ED.¹¹

In the study by Farooq et al, sensitivity and specificity of GBS for predicting the need for endoscopic therapy was 100% and 4% at GBS 0 and 74% and 52% at GBS 5, respectively and the score was significantly higher in the high risk group than in the low risk group.¹² When a cut-off value of 2 was used, the sensitivity and specificity were 100% and 13%, respectively.¹³ In our study, a GBS score of 3 was 93% sensitive and 37% specific, thus ensuring good sensitivity with moderately poor specificity. The important point to consider is that a good clinical score for endoscopic intervention in UGIB should not miss any patient to avoid inadvertent mortality.

Increasing the cut-off value may improve the specificity, as in a study where a cut-off value of GBS 7 was used, using the ROC curve, following results were found; a sensitivity of 96%, specificity of 69% (51-87%), PPV of 74% (59 -90%) and NPV of 95% (85-100%).¹⁴ The PPV is almost similar to our study but the low NPV in our study is due to a large number of patients in our study with HCV related portal gastropathy who do not undergo endoscopic intervention but still have a high GBS score due to hemodynamic instability.

The GBS score is also reported to be missing patients at high risk for recurrent bleed (true negatives). In a study where pre-Endoscopic Rockall and Blatchford Scores were compared in identification of endoscopic intervention in UGIB, out of 63 patients with GBS equal to zero; 15 (24%; 95% CI 15-36%) were admitted to the hospital and 2 (13%; 95% CI 4-38%) received endoscopic hemostasis.¹⁵

Overall GBS score in our study was efficient in predicting the need for endoscopic therapy or surgical intervention (AUROC: 0.818) (Fig. 1). Similar values of 0.834, 0.868 and 0.739 have been reported.^{4,16,17} In a recent large study from Hong Kong, the GBS was again shown to be a better predictor of need for endoscopic therapy than the admission Rockall score, with an AUROC of 0.72 and admission Rockall score was unable to predict need for endoscopic therapy.¹⁸ The GBS score at 30

days seem to perform better with an AUROC of 0.92 with around 50% needing endoscopic intervention.¹⁹ Long term follow up of patients discharged with low GBS score still needs to be done in future studies to determine whether they had UGIB later on or required endoscopy in future.

CONCLUSION

GBS score is a useful tool with a particularly good value for identifying high risk patients in need for endoscopic intervention. Improvement in scores to account for upper GI bleed might improve the specificity of GBS score.

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