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Comparison of Glasgow Blatchford Score and ABC Score to Predict Outcomes in Patients with Acute Upper GI Bleeding

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ABSTRACT

Background: Acute upper gastrointestinal bleeding is a common medical emergency with high mortality. Risk stratification methods such as the Glasgow Blatchford Score (GBS) and the ABC score predict clinical outcomes and guide early care, although their mortality prediction accuracy varies across groups. **Objective:** To compare the predictive accuracy of Glasgow Blatchford Score (GBS) and ABC score for mortality in patients presenting with acute upper gastrointestinal bleeding. **Study Design:** Retrospective cross-sectional analytical study. **Settings:** Gastroenterology Department, Aziz Fatimah Hospital, Faisalabad Pakistan. **Duration:** 12 months from February 01, 2025 to January 31, 2026. **Methods:** Non-probability consecutive sample of 90 individuals were selected after meeting inclusion and exclusion criteria. Clinical, lab, and endoscopic data were documented. GBS and ABC scores were determined. In-hospital mortality was measured. Data was processed with SPSS 27. Predictive performance was assessed using ROC curves. **Results:** Patients' mean age was 37.49 ± 12.02 years, with 64.4% males. The mortality rate was 15.6%. The mean GBS and ABC scores were 11.97 ± 6.60 and 4.36 ± 2.74, respectively. Both scoring systems showed statistically significant association with mortality (GBS ≥7, p=0.021; ABC ≥4, p=0.001). However, ROC analysis demonstrated poor discriminatory performance, with AUC values of 0.476 for GBS and 0.433 for ABC score. **Conclusion:** Acute upper gastrointestinal bleeding mortality was poorly predicted by GBS and ABC score. Clinical value for mortality prediction remains limited, and larger trials are needed to find better prognostic methods.

Keywords: *Upper gastrointestinal bleeding, GBS, ABC score, Mortality, Risk stratification.*

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INTRODUCTION

Acute upper gastrointestinal bleeding (AUGIB) is an emergency condition having a mortality rate of 2-10%[1]. The overall annual admission rate for upper gastrointestinal (UGI) bleeding in the United States is around 160 per 100,000 individuals, and the estimated medical cost of hospital services for patients with UGI bleeding is very high.[1] AUGIB is a major emergency in Pakistan as well. Studies have reported an annual incidence of approximately 50-150 cases per 100,000 population,[2] accounting for substantial hospital admissions. Common causes of AUGIB include peptic ulcer disease (duodenal or gastric ulcers) followed by erosive gastritis and duodenitis, bleeding esophageal varices, Mallory–Weiss tears, angiodysplasias or other vascular malformations, and tumors.[3]

Management of AUGIB and understanding of risk stratification have attracted considerable research interest over the past decade. Prompt diagnosis and accurate stratification of patients at increased risk of mortality and re-bleeding are important for treatment optimization and timely decision-making by physicians in the emergency setting.[4,5] Different risk-scoring protocols have been developed to categorize patients into high-risk and low-risk AUGIB subgroups.[6,7] There are different goals in various scoring systems, such as predicting mortality, applying interventions, or determining blood transfusions. One should be aware of these facts while comparing them. Different scoring systems require various parameters, such as clinical data and endoscopic findings, etc.[8,9] Among these scores, the Glasgow Blatchford score (GBS) is one of the most common. Although the GBS score has many positive aspects however, its effectiveness in ICU settings is limited. As many parameters need to be memorized for calculations, these are used less often in emergency services.[10,11,12]

In a study conducted by Barkun et al.,[7] patients experiencing AUGIB were compared using the ABC score, AIMS65, GBS

score, and clinical Rockall score. With an Area Under the Curve (AUROC) of 0.78, the ABC score outperformed the other metrics in predicting 30-day mortality. Compared with AIMS65 (0.73) and GBS (0.69), it performed similarly. The research found a considerable clinical risk with an overall death rate of 9.9%. There were also secondary outcomes including rebleeding (11.4%) and intensive care unit hospitalization (21.1%). The scoring systems' discriminative power was low, even though they had a statistical correlation with secondary outcomes.[7]

This research will evaluate and compare the impact of GBS and ABC score on clinical practice. More effective use of medical resources is possible with scores that are easier to compute and remember. Plus, it might be a solution to the dilemma of whether or not patients with upper GI bleeding need critical care.

METHODS

This retrospective cross-sectional analytical study was conducted in the Gastroenterology Department of Aziz Fatimah Hospital, Faisalabad, for a duration of 12 months following the acceptance of the study summary by the Institutional Ethical Review Committee (vide letter no IEC/427-26, dated 21-05-2026). Using non-probability consecutive sampling, a total of 90 patients were included. Using a 95% confidence level, a 10% dropout tolerance, and an estimated death rate of 11.4%, the sample size was determined with the WHO sample size calculator. Inclusion criteria for the study were endoscopy-confirmed cases of acute upper gastrointestinal bleeding (hematemesis, coffee-ground vomiting, melena) in patients aged 18–60 years of both genders. Patients with endoscopy or hospitalization not performed, patients with lower or persistent gastrointestinal bleeding, patients with other major comorbidities (Cardiac failure, renal failure, stroke, COPD) and patients with insufficient medical records were excluded from the study.

Acquiring informed consent was the first step in enrolling eligible patients. All patients were treated according to the conventional protocol, which follows the most recent guidelines from the British Society of Gastroenterology 13. This includes administering proton pump inhibitors, providing fluid resuscitation, and ensuring airway protection as needed. Laboratory tests included hemoglobin, total leukocyte count, platelet count, INR, total and direct bilirubin, albumin, electrolytes, liver enzymes, BUN, and serum creatinine. For the purpose of diagnosing upper gastrointestinal bleeding, endoscopy was carried out in all cases where it was practicable to do so. Based on clinical and laboratory characteristics, each patient had their Glasgow-Blatchford Score (GBS) and ABC score determined. While hospitalized, patients were monitored to measure outcomes, especially all-cause mortality, and these outcomes were compared using the corresponding scoring systems.

The data were examined using SPSS version 27. The mean ± standard deviation was used to present quantitative information, such as age, hemoglobin level, GBS, and ABC score. The results and gender were examples of qualitative variables represented using frequencies and percentages. For qualitative factors, we used the chi-square test, and for quantitative data, we used the independent-samples t-test. Area under the ROC curve (AUROC) and Receiver Operating Characteristic (ROC) curves were used to assess the scoring systems' diagnostic effectiveness in predicting mortality. By using the highest Youden index, we identified the ideal cut-off values for each scoring system.

RESULTS

This research comprised a total of 90 individuals who presented with severe bleeding in the upper gastrointestinal tract. Patients' mean age 37.49 ± 12.02 years, with a mean BMI of 26.3 ± 3.8 kg/m². Among those who participated in the research, men accounted for 64.4% and women 35.6%. Out of all the patients admitted to the hospital, 15.6% (n=14) died while 84.4% (n=76) managed to stay alive. The total scores for GBS) and ABC were 11.97 ± 6.60 and 4.36 ± 2.74, respectively.

Table 1: Demographic characteristics (n = 90)

Variable		Frequency	Percentage %
Age (years)		37.49	12.02
BMI (kg/m²)		26.3	3.8
Gender	Male	58	64.4%
	Female	32	35.6%

Table 1 presents the demographic characteristics of the study population. The mean age and body mass index (BMI) show a relatively young cohort with moderate BMI, and a male predominance was observed.

Table 2: Baseline clinical characteristics

Variables		Frequency	Percent
Comorbidities	Yes	53	58.9
	No	37	41.1
Syncope	Yes	34	37.8
	No	56	62.2
Hepatic Disease	Yes	19	21.1
	No	71	78.9
Cardiac Failure	Yes	17	18.9
	No	73	81.1
Aspirin	Yes	33	36.7
	No	57	63.3
Other Antithrombotic	Yes	20	22.2
	No	70	77.8
NSAIDs	Yes	38	42.2
	No	52	57.8
Coffee Ground Vomit	Yes	34	37.8
	No	56	62.2
Hematemesis	Yes	66	73.3
	No	24	26.7
Melaena	Yes	56	62.2
	No	34	37.8
Hematochezia	Yes	19	21.1
	No	71	78.9

Comorbidities were present in 58.9% of patients (Table 2). Common presenting features included hematemesis (73.3%) and melaena (62.2%), while 37.8% had coffee-ground vomiting. Use of NSAIDs was reported in 42.2% of patients,

and 36.7% were taking aspirin. Hepatic disease and cardiac failure were observed in 21.1% and 18.9% of patients, respectively.

Table 3: Laboratory parameters

Variables	Minimum	Maximum	Mean	Std. Deviation
Hb	58.1	146.3	94.43	18.61
Urea	0.3	21.4	9.94	4.76
Albumin	22.7	50.7	35.31	5.55
Creatinine	31.7	174.0	97.75	31.14
SBP	42.0	163.0	106.10	21.75
Pulse	59	130	93.63	14.31

Mean GBS11.97±6.605

Mean ABC Score 4.36±2.74

The mean hemoglobin level was 94.43 ± 18.61 g/L, mean urea and creatinine levels were 9.94 ± 4.76 mmol/L and 97.75 ± 31.14 µmol/L, respectively. The mean systolic blood pressure was 106.10 ± 21.75 mmHg, and the mean pulse rate was 93.63 ± 14.13 beats/minute.

Table 4: Outcome

Outcome	Frequency	Percentage %
Mortality (Yes)	14	15.6
Mortality (No)	76	84.4
Total	90	100.0

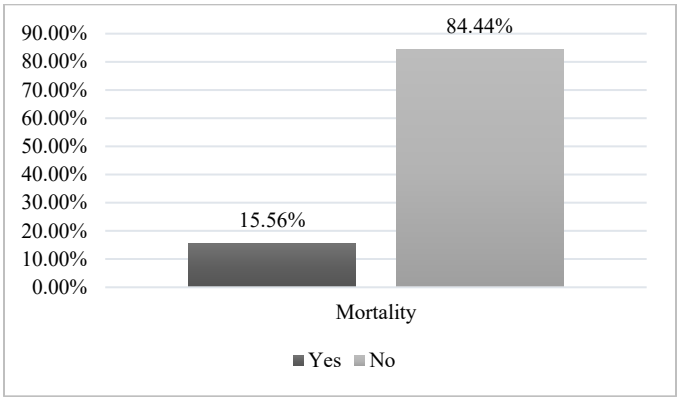
Table 4 demonstrates patient outcomes, showing that 15.6% of patients died during hospitalization, while the majority (84.4%) survived.

Table 5: Association of Risk Categories with Mortality

Risk Category	Risk Category	Mortality	Mortality	Total	p-value
Risk Category	**Risk Category**	Yes	No	**Total**	**p-value**
GBS Category	GBS ≥7	14	56	70	0.021
GBS Category	GBS ≥7	100.0%	73.7%	77.8%	0.021
GBS Category	GBS <7	0	20	20	0.021
GBS Category	GBS <7	0.0%	26.3%	22.2%	0.021
ABC	ABC ≥4	14	42	56	0.001
ABC	ABC ≥4	100.0%	55.3%	62.2%	0.001
ABC	ABC <4	0	34	34	0.001
ABC	ABC <4	0.0%	44.7%	37.8%	0.001
Total	Total	14	76	90	
Total	Total	100.0%	100.0%	100.0%	

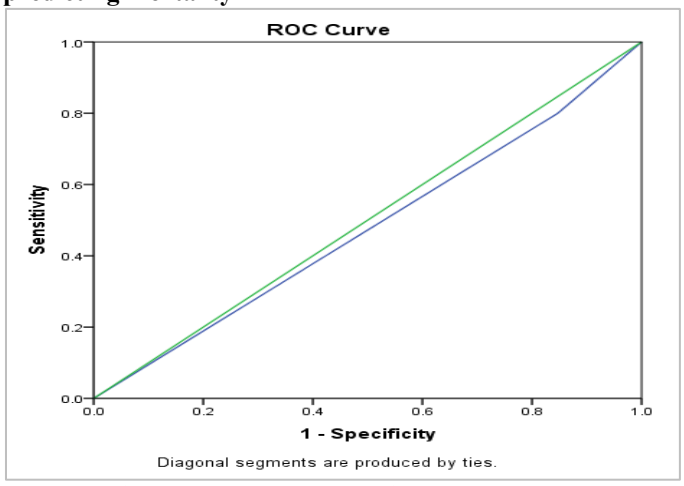
Table 5 illustrates the association between risk categories and mortality. All patients who died had a GBS ≥7 and ABC score ≥4. A statistically significant association was observed between higher risk categories and mortality for both GBS (p=0.021) and ABC score (p=0.001).

Figure 1: Distribution of mortality among study participants



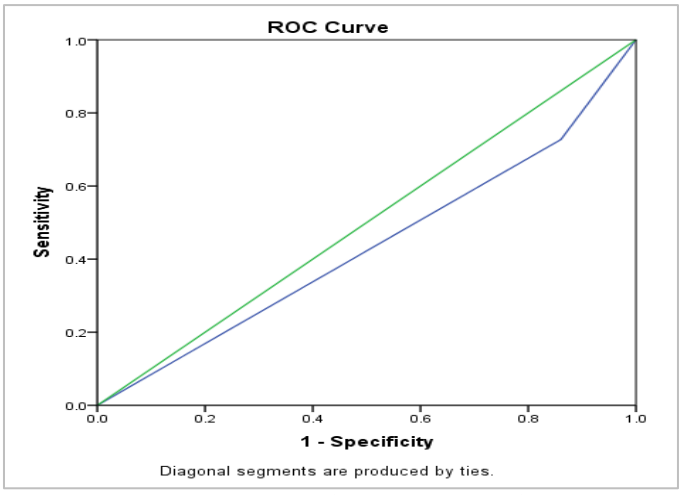
The figure demonstrates that 15.56% (n=14) of patients died during hospitalization, while the majority, 84.44% (n=76), survived. This indicates that although most patients had a favorable outcome, a considerable proportion experienced mortality.

Figure 2: ROC curve of Glasgow Blatchford score for predicting mortality



The curve lies close to the diagonal, with an AUC of 0.476, indicating poor discriminative ability.

Figure 3: ROC curve of ABC score for predicting mortality.



The curve demonstrates poor predictive performance with an AUC of 0.433.

The ROC curve for the ABC score also closely follows the diagonal, indicating poor predictive performance. The AUC was 0.433, indicating that the ABC score failed to differentiate between patients who survived and those who died effectively. Similar to GBS, the presence of ties may have contributed to reduced discriminatory power.

DISCUSSION

Our study evaluated the predictive performance of GBS and the ABC score in determining mortality among AUGIB patients. The results showed that both scoring systems demonstrated poor discriminatory ability, with AUC values of 0.476 for GBS and 0.433 for the ABC score. These results suggest that neither tool was effective at differentiating survivors from non-survivors in the present cohort. This contrasts with several previously published studies.

In this study, the overall mortality rate was 15.6%, which is higher than the mortality rate reported by Barkun et al., who reported 9.9% in a large Canadian registry[7]. The higher mortality in our cohort may be attributed to differences in healthcare infrastructure, delayed presentation, and variability in patient management protocols in a resource-limited setting.

The ABC score has been shown in previous studies to have superior predictive accuracy for mortality. For instance, Barkun et al. demonstrated that the ABC score had an AUROC of 0.78, outperforming the GBS and Rockall scores and showing performance comparable to AIMS65[7]. Similarly, a study by Kherad et al. reported good discrimination of the ABC score in predicting mortality, reinforcing its clinical utility 14. However, in contrast to these findings, our study showed poor performance of the ABC score, which may be due to differences in sample size, patient characteristics, and clinical heterogeneity.

The primary purpose of the GBS score is to determine the need for clinical intervention, not mortality. Previous research has consistently shown that GBS performs well in identifying low-risk patients suitable for outpatient management but is less accurate in predicting mortality. Laursen SB et al. demonstrated that while GBS is useful for early risk stratification, it lacks sufficient discriminatory power for mortality outcomes[15].

Reports indicate that AIMS65, another popular scoring system, performs well at predicting mortality. Compared with GBS, AIMS65 offers superior mortality prediction, according to studies by Hyett et al. [16]. This study's low prediction accuracy might be due to several factors. To start, it's possible that the statistical power and reliability of the ROC analysis were compromised due to the small sample size (n=90) and the low number of mortality events (n=14). The second issue is that the scoring methods aren't very good at discriminating because the dataset contains ties, as ROC analysis shows. This means that the survivors and non-survivors have overlapping score distributions.

The present study provides valuable insight into the real-world performance of GBS and ABC scores in a tertiary care hospital setting. The findings highlight the need for caution when applying these scoring systems in different populations and emphasize the importance of developing region-specific risk stratification tools. Both the GBS and ABC scores performed poorly at predicting mortality among UGIB patients in our study. These observations were in contrast with previous literature, specifically regarding the ABC score, which is reported to have superior predictive accuracy. However, large-scale, multicenter studies are required to validate these findings and explore more reliable, context-specific prognostic models for UGIB patients.

CONCLUSION

Both the GBS and ABC scores showed limited accuracy in predicting mortality among patients presenting with AUGIB. Although higher scores were significantly associated with mortality, their overall discriminatory performance was poor. These findings suggest that these scoring systems may have limited clinical application for predicting mortality in this population.

LIMITATIONS

Study was conducted in single-center with small sample size.

SUGGESTIONS / RECOMMENDATIONS

Large-scale, multicentred studies are required to validate these results.

CONFLICT OF INTEREST / DISCLOSURE

No conflict of interest.

FUNDING SOURCE

Not funding source required.

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