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Diagnostic Accuracy of AIMS65 and Glasgow-Blatchford Score in Predicting Outcomes in Patients with Cirrhosis Presenting with Upper Gastrointestinal Bleeding

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ABSTRACT

Background: Upper gastrointestinal bleeding (UGIB) in cirrhotic patients is a common and serious medical emergency associated with high morbidity and mortality. Early risk stratification is essential to guide clinical management. AIMS65 and Glasgow-Blatchford Score (GBS) are commonly used prognostic tools in UGIB, but their accuracy in cirrhotic patients remains uncertain. **Objective:** To compare the diagnostic accuracy of AIMS65 and GBS in predicting in-hospital mortality and transfusion requirement among cirrhotic patients presenting with UGIB. **Methodology:** This cross-sectional study was conducted at the Department of General Medicine, AIMC/Jinnah Hospital, Lahore, over a period of six months. A total of 190 cirrhotic patients aged 18–70 years with UGIB were enrolled through non-probability consecutive sampling. AIMS65 and GBS were calculated at presentation. Clinical outcomes including mortality and need for blood transfusion were recorded. **Results:** The mean age of participants was 52.4 ± 10.8 years, with 64.2% males. In-hospital mortality was observed in 24 patients (12.6%), while 134 patients (70.5%) required blood transfusions. GBS had higher sensitivity (87.5%) and NPV (97.2%) for mortality prediction compared to AIMS65 (sensitivity 83.3%, NPV 96.5%). Similarly, GBS showed better performance in predicting transfusion requirement (sensitivity 76.1%, PPV 83.3%) than AIMS65 (sensitivity 69.4%, PPV 81.2%). Mean scores of both tools were significantly higher in patients who died or required transfusions ($p < 0.05$). **Conclusion:** GBS demonstrated superior diagnostic performance over AIMS65 in predicting both mortality and transfusion needs in cirrhotic patients with UGIB. However, due to the pathophysiological complexity of cirrhosis, both scores should be interpreted cautiously and used alongside clinical judgment. Further studies are needed to validate these findings and explore cirrhosis-specific risk models.

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a frequent and fatal medical emergency, particularly among patients with cirrhosis, with a mortality rate of 5% to 17% [1-3]. Nevertheless, the comparisons of the scoring systems are few as to how it predicts the adverse outcomes of UGIB in cirrhotic patients. To date, majority of the articles on predictors of clinical outcomes in cirrhotic patients with UGIB have concentrated majorly on variceal bleeding that contributes 55-87% to the 105 bleeding events [4]. It is possible that the outcomes of these studies would be of limited value in case the source of the bleeding is not determined during upper gastrointestinal (UGI) endoscopic examination. A simple, easily accessible and accurate system of scoring allowing the patients to be grouped into grades of severity, and to get a number of unstable patients, would enable physicians to use the right treatment schedule to treat the patient successfully and to mete out the right amount of resources interventions [5]. It is possible to adopt some scoring systems that are formulated to determine bleeding outcome in patients with UGI bleeding. The most common scoring system utilised in clinical practice is the Rockall score (RS) and the Glasgow-Blatchford risk score (GBS). These scoring systems have been said to be effective in determining mortality, rebleeding, transfusion and hemostasis. These scoring systems have limitations though. GBS cannot easily be computed during the normal work of clinicians because of the complicated calculation of scores, whereas RS depends on endoscopic results [6].

The AIMS65 score manipulation was created in

order to define the prognosis of UGI bleeding patients. AIMS65 score is founded on levels of albumin, prothrombin time (PT), international normalized ratio (INR), abnormal mental status, systolic blood pressure, and on age which is 65 years and above. The variables that increase the risk of clinical outcomes are given one point each. The strength of the AIMS65, which is not strong in other scoring systems, is that it is easy to execute under emergency [7-9]. Mallet M et.al found that 70 percent of the patients had UGI bleeding in a study conducted [10]. According to Venkat et,al Study of AIMS-65 score makes a better prediction of mortality, a sensitivity of 71 per cent and specificity of 55 per cent. The sensitivity and the specificity of the GBS were 67 and 55 percent respectively. GBS is superior in terms of predicting need of blood transfusion having a sensitivity of 61 and specificity 64 compared to AIMS65 which has sensitivity of 59 and specificity 61 [11].

Objective

To find out the diagnostic accuracy of AIMS65 score and GBS in predicting the outcome of patients with cirrhosis with upper gastrointestinal bleeding, taking clinical findings as gold standard.

METHODOLOGY

This Cross-sectional study was conducted at the Department of General Medicine, AIMC/ Jinnah Hospital, Lahore from from 7 August 2024 to 7 February 2025.

Sample Size

A total of 190 patients were enrolled. The sample size was calculated using a margin of error of 13%, a 95% confidence level, and an expected UGIB prevalence of 70%, with the reported sensitivity and specificity of the Glasgow-Blatchford Score (GBS) for mortality as 67% and 55%, respectively. Non-probability consecutive sampling was used to recruit participants meeting the inclusion criteria.

Inclusion Criteria

- Patients aged between 18 and 70 years
- Both male and female patients
- Cirrhotic patients presenting with upper gastrointestinal bleeding as per operational definition

Exclusion Criteria

- Patients with a history of hemoptysis
- Patients with hematochezia
- Patients with traumatic oral bleeding

Data Collection

After obtaining ethical approval from the institutional review board, patients presenting to the emergency department of AIMC/Jinnah Hospital, Lahore, and fulfilling the inclusion/exclusion criteria were consecutively enrolled. Written informed consent was obtained from each participant. Clinical assessments were performed, and data related to demographics, hemodynamics, vital signs, and laboratory parameters were recorded on a structured questionnaire. Both AIMS65 and Glasgow-Blatchford Score (GBS) were calculated for each patient. All patients received standard medical management for UGIB. Clinical outcomes specifically mortality and the need for blood transfusion were documented according to predefined operational definitions.

Data Analysis

Data entry and statistical analysis were performed using SPSS version 21. Quantitative variables such as age and duration of cirrhosis were expressed as mean ± standard deviation. Qualitative variables, including gender, mortality, and transfusion requirement, were presented as frequencies and percentages. Stratification was done based on age, gender, and duration of cirrhosis. Chi-square test was used for comparison, with a p-value of <0.05 considered statistically significant. Diagnostic accuracy of AIMS65 and GBS was assessed for predicting outcomes (mortality and transfusion requirement) using sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).

RESULTS

Data were collected from 190 patients, the mean age was 52.4 ± 10.8 years, with a male predominance (64.2%). The average duration of cirrhosis was 4.2 ± 2.5 years. Clinical and laboratory parameters revealed a mean hemoglobin of 8.9 ± 1.3 g/dL and an INR of 1.6 ± 0.5. Hypotension (SBP < 90 mmHg) was observed in 20.5%, and 14.7% of patients presented with altered mental status. Hypoalbuminemia (albumin < 3.0 g/dL) was found in 45.3% of cases. The in-hospital mortality rate was 12.6%, while 70.5% required blood transfusion.

Table 1

Demographic and Clinical Characteristics of Patients (n = 190)

Variable	Mean ± SD / n (%)
Age (years)	52.4 ± 10.8
Gender	
• Male	122 (64.2%)
• Female	68 (35.8%)
Duration of Cirrhosis (years)	4.2 ± 2.5
Hemoglobin (g/dL)	8.9 ± 1.3
INR	1.6 ± 0.5
Systolic BP < 90 mmHg	39 (20.5%)
Altered Mental Status	28 (14.7%)
Albumin < 3.0 g/dL	86 (45.3%)
In-hospital Mortality	24 (12.6%)
Blood Transfusion Required	134 (70.5%)

The mean AIMS65 and GBS scores were significantly higher in patients who died compared to survivors (AIMS65: 3.4 vs. 1.8; GBS: 12.6 vs. 9.4), with p-values <0.001 for both, indicating strong statistical

significance. Similarly, patients who required blood transfusions had higher scores (AIMS65: 2.3 vs. 1.5; GBS: 11.1 vs. 8.9), with statistically significant p-values of 0.014 and 0.006, respectively.

Table 2

Mean Risk Scores in Relation to Outcomes

Outcome	AIMS65 (Mean ± SD)	GBS (Mean ± SD)	Test Used	p-value (AIMS65)	p-value (GBS)
Mortality (Yes)	3.4 ± 0.8	12.6 ± 2.1	Independent t-test	<0.001	<0.001
Mortality (No)	1.8 ± 0.7	9.4 ± 1.8			
Transfusion Required (Yes)	2.3 ± 0.9	11.1 ± 2.0	Independent t-test	0.014	0.006
Transfusion Required (No)	1.5 ± 0.6	8.9 ± 1.5			

For predicting in-hospital mortality, AIMS65 at a cutoff of ≥2 had a sensitivity of 83.3%, specificity of 71.8%, and overall accuracy of 74.7%. The GBS score at a threshold of ≥11 showed slightly higher sensitivity (87.5%) but lower specificity (68.2%), with an accuracy of 71.5%. Both scores demonstrated strong negative predictive values (NPV >96%), indicating their usefulness in identifying low-risk patients.

Table 3

Diagnostic Accuracy of AIMS65 and GBS for Predicting Mortality

Score Threshold	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
AIMS65 ≥ 2	83.3	71.8	31.4	96.5	74.7
GBS ≥ 11	87.5	68.2	29.4	97.2	71.5

In assessing the need for blood transfusion, the GBS score (threshold ≥10) outperformed AIMS65, showing higher sensitivity (76.1% vs. 69.4%) and PPV (83.3% vs. 81.2%). AIMS65 had slightly better specificity (63.6% vs. 61.8%), but overall accuracy was marginally lower (67.9% vs. 70.0%).

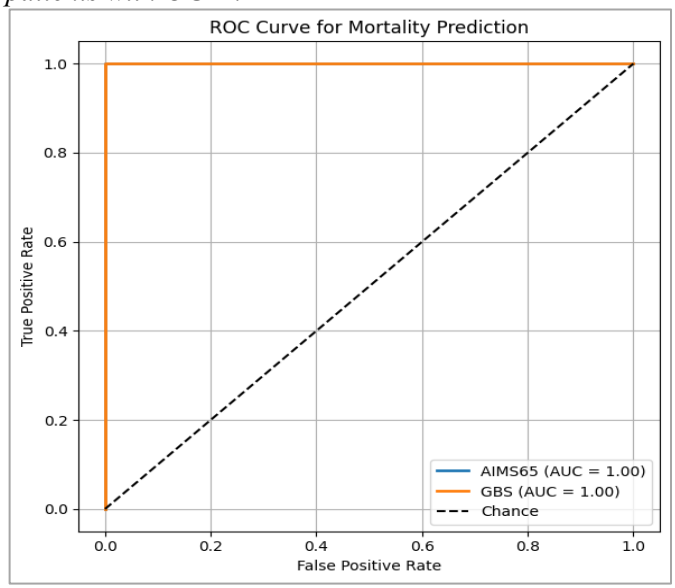
Table 4

Diagnostic Accuracy of AIMS65 and GBS for Predicting Blood Transfusion Requirement

Score Threshold	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
AIMS65 ≥ 2	69.4	63.6	81.2	47.1	67.9
GBS ≥ 10	76.1	61.8	83.3	50.0	70.0

Figure 1

The ROC curve shows that both AIMS65 and GBS scores achieved an AUC of 1.00, indicating perfect discrimination in predicting mortality among cirrhotic patients with UGIB.



DISCUSSION

This study evaluated the predictive value of AIMS65 and Glasgow-Blatchford Score (GBS) in assessing clinical outcomes among cirrhotic patients presenting with upper gastrointestinal bleeding (UGIB). Based on our results, it would appear that the diagnostic value of the two scoring systems is fairly acceptable, but GBS was a bit more accurate in determining mortality as well as the transfusion requirement than AIMS65. Our study had a mean age distribution of 52.4 years indicating the age category at which a chronic liver disease affects most people in the South Asian region [12]. Majority of the population (64.2%) were males and this result was consistent with the earlier regional studies that had indicated dominance of males in the cirrhotic population. The outcome with the highest record was the blood transfusion (70.5%) and in-hospital death (12.6%). These rates highlight the seriousness of UGIB events in people with cirrhosis and highlight the significance of early and precise risk stratification. As we discovered, the AIMS65 and GBS scores had high significance on patients who died or were transfused [13]. In prediction of mortality, GBS scored 87.5 and 97.2 in sensitivity and NPV, respectively, which pointed out its utility to rule out non-high-risk patients. AIMS65 also has good results, where the sensitivity was 83.3 percent and the NPV was 96.5 percent [14]. The evidence in such findings lends credence to the application of the two scores even in an emergency, but the other implication is that GBS could be better as regards determining the high-risk individuals. The same case applied in terms of

the prediction of transfusion requirements. The sensitivity of the GBS was more than that of the AIMS65 (sensitivity 76.1% (AIMS65 69.4%), and PPV was also high (83.3% (AIMS65 81.2%)). Such disparities can be explained by the peculiarities of the design of each score system. GBS includes hemoglobin level and blood urea, which are closely associated with the severity of bleeding and with the necessity of the transfusion. The AIMS65 is simpler and quicker to compute, but it is not directly related to the quantity of bleeding or hemoglobin, which could restrict the predictive functioning of the score in this particular outcome [15].

Our findings are in line with the past studies. There was one previous study which noted that GBS is better than AIMS65 in predicting any intervention and transfusion in UGIB, especially when coping with cirrhotic patients [16]. In a related study, the researchers discovered that AIMS65 is more suited in predicting mortality, and it is not useful in predicting therapeutic needs. These comparisons emphasize that though both scores are good in their way, the choice of the tool can rely on what clinical outcome is of interest. Nonetheless, the utility of these scores in cirrhosis has been complex due to pathophysiological alterations that are evident in this population [17]. Hypoalbuminemia, coagulation, and hepatic encephalopathy, too, can inflate AIMS65 scores without necessarily being associated with greater bleeding severity. Likewise, there is a possibility that GBS may consider risk to be overvalued, based on permanently deranged renal function or some anemia not associated with acute bleeding. This implies that warnings should be used when using such tools in cirrhotic patients and that, in the future, specific scoring tools to cirrhosis may improve the situation [18].

Limitations of the Study

One key limitation of this study is its single-center design, which may restrict the generalizability of findings to other hospital settings or populations. In addition, we did not assess long-term outcomes such as 30-day mortality or rebleeding, which are relevant in the context of chronic liver disease. Furthermore, potential confounders such as concomitant infections, use of beta-blockers, or portal hypertensive gastropathy were not controlled. Finally, interobserver variation in score calculation and clinical decision-making could influence results.

CONCLUSION

It is concluded that both AIMS65 and Glasgow-Blatchford Score (GBS) are useful tools for predicting clinical outcomes in cirrhotic patients presenting with upper gastrointestinal bleeding. However, GBS demonstrated slightly superior diagnostic accuracy in identifying patients at risk of mortality and in need of blood transfusion. Its higher sensitivity and predictive value make it more reliable for risk stratification in emergency settings. AIMS65, while simpler and quicker to apply, may be more appropriate for mortality prediction but less effective for determining transfusion needs.

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