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Original Contribution

Scoring systems used to predict mortality in patients with acute upper gastrointestinal bleeding in the ED

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ABSTRACT

Objective: Acute upper gastrointestinal bleeding (UGIB) is a potentially life-threatening condition that requires rapid assessment in the emergency department (ED). We aimed to compare the performance of the AIMS65, Glasgow-Blatchford (Blatchford), preendoscopic Rockall (pre-Rockall), and preendoscopic Baylor bleeding (pre-Baylor) scores in predicting 30-day mortality in patients with acute UGIB in the ED setting.

Methods: Consecutive patients with acute UGIB who were admitted to the ED ward during 2012–2016 were retrospectively recruited. Data were retrieved from the admission list of the ED using international classification of disease codes via computer registration. The predictive accuracy of these four scores was compared using the area under the receiver operating characteristic curve (AUC) method.

Results: Among the 395 patients included during the study period, the total 30-day mortality rate was 10.4% (41/395). The AIMS65 and Glasgow-Blatchford scores performed better with an AUC of 0.907 (95% confidence interval (CI), 0.852–0.963; $P < 0.001$) and 0.870 (95% confidence interval, 0.833–0.902; $P < 0.001$) compared with other scoring systems (preendoscopic Rockall score: AUC, 0.709; 95% CI, 0.635–0.784; $P < 0.001$; preendoscopic Baylor score: AUC, 0.523; 95% CI, 0.472–0.573; $P > 0.05$).

Conclusion: In patients with acute UGIB in the ED, the AIMS65 and Glasgow–Blatchford scores are clinically more useful for predicting 30-day mortality than the preendoscopic Rockall and preendoscopic Baylor scores. The AIMS65 score might be more ideal for risk stratification in the ED setting.

1. Introduction

1.1. Background

Acute upper gastrointestinal bleeding (UGIB) is a common cause of hospital admission and a leading cause of death in the emergency department (ED). The overall mortality of acute UGIB varies from 3% to 15%, with higher rates of death for those in an unstable hemodynamic state [1,2]. American College of Gastroenterology guidelines recommend risk stratification early in the management of patients with acute UGIB to help triage patients into the appropriate level of care [3]. However, accurately and rapidly identifying patients who are at highest risk for mortality early in the course of acute UGIB can be challenging for an emergency physician. Thus, the development of an immediate stratification system either without or before endoscopy in an ED setting is particularly necessary.

The number of published risk scoring systems for patients with acute UGIB has increased quickly in recent decades, largely due to the popularity of rapid response systems. However, many of these predictive tools rely on endoscopic results and are, therefore, not ideal for early evaluation of patients. Most of these risk scores are based mainly on results from patients with nonvariceal bleedings, and thus, they cannot be used to evaluate a mixed patient population. Several risk scores can be applied prior to endoscopy results, and are particularly useful in the ED. Among them, the most notable scales are the AIMS65 score (Albumin, international normalized ratio, altered mental status, systolic blood pressure, aged above 65 years) and the Glasgow-Blatchford score, which is designed to assess the likelihood that a patient with an acute UGIB will need to have medical intervention such as a blood transfusion or endoscopic intervention [4,5]. Full Rockall and Baylor bleeding scores require endoscopic information and cannot be obtained early and easily in the ED, but physicians can use the preendoscopic part of these two risk scales [6,7]. Moreover, there is limited evidence for comparing the predictability of these scoring systems in a mixed patient population.

Therefore, we aimed to systematically retrieve and assess the available data on the AIMS65 and Glasgow-Blatchford scores and other two preendoscopic scoring systems (pre-Rockall and pre-Baylor), to

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determine the ability of each scale to correctly predict all-cause 30-day mortality in patients with acute UGIB in the ED setting.

2. Materials and methods

2.1. Study design and setting

This was a retrospective cohort study conducted at a tertiary-care hospital affiliated to Fudan University in Shanghai. The definition of acute UGIB was based on the presence of at least one of the following three features: hematemesis, melena, and firm clinical evidence and laboratory support for acute blood loss from the upper gastrointestinal (UGI) tract. Patients presenting with iron deficiency anemia without evidence of acute upper gastrointestinal bleeding (UGIB) were excluded [8].

According to the standard protocol of our ED, all patients presenting with suspected acute UGIB should be given a PPI (proton pump inhibitor). Typically, a high-dose bolus followed by continuous infusion is recommended. In addition, for patients at risk for variceal hemorrhage, somatostatin should be given (250 μg bolus followed by an infusion of 250 μg /h), which can subsequently be discontinued if the bleeding source is demonstrated to be nonvariceal. The initial treatment of unstable UGIB in our ED includes resuscitation with crystalloid and blood transfusions, intravenous vasopressin, and prompt consultation with a specialist. Emergency endoscopy examination and surgical management should be performed for patients who developed persistent or recurring bleeding. Patients without evidence of active bleeding and in stable condition are transferred to the observation ward and might be discharged if there is no more gastrointestinal bleeding.

The Hospital Ethics Committee on Human Research approved this retrospective cohort study. Written informed consent from patients was not required because the study design comprised part of the current standard of care in our ED, and patient data were anonymous.

2.2. Patient selection

All patients aged >14 years who presented with acute UGIB and were admitted to the ED ward between June 1, 2012, and May 31, 2016 were included in the study. Exclusion criteria were patients with incomplete records or patients who were transferred from another hospital. We also excluded patients who had been followed up for <30 days and those with a diagnosis other than UGIB after admission.

2.3. Methods and measurements

Patients who were admitted to the Division of Gastroenterology from the ED with a primary diagnosis of acute UGIB were retrospectively analyzed. All patients had undergone emergency upper GI endoscopy and were actively bleeding. Data were retrieved from the ED admission list by computer registration. A trained student who was blinded to the study purpose performed the record review and data abstraction using a standardized template with a clear definition and code. The first author performed quality improvement feedback after data analysis. Demographic data were also collected. The primary outcome measure was 30-day all-cause mortality during admission to the hospital. Other parameters analyzed were rebleeding, blood transfusion requirements, and duration of hospitalization. The AIMS65 [4], Glasgow-Blatchford [5], preendoscopic Rockall [6], and preendoscopic Baylor [7] scores were calculated for each individual.

2.4. Statistics

All data were analyzed using SPSS Version 19.0 for Windows (SPSS, Chicago, IL, USA) and MedCalc Version 15.2.2 for Windows. Descriptive data are presented as the median and interquartile range for continuous variables. Categorical data are presented as proportions. Nominal variables were evaluated using either Pearson's $\chi 2$-test or Fisher's exact test. The distribution of 30-day mortality for each score was assessed using Pearson's $\chi 2$-test. The AIMS65 and Blatchford scores were also

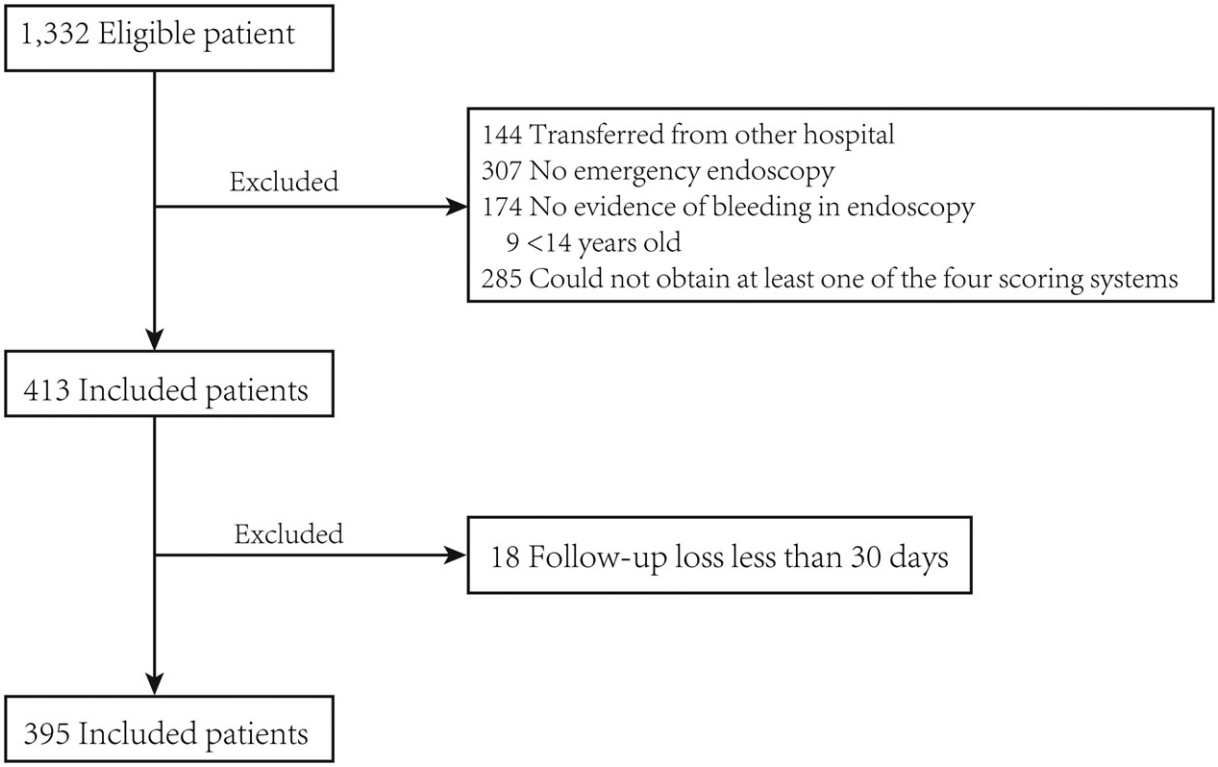

Fig. 1. Flow chart of patients enrolled in this study.

combined as a single predictor (A + B) by using a logistic regression model to obtain the probability according to different variables.

Receiver-operating characteristic (ROC) curves for 30-day mortality were calculated for the AIMS65, Blatchford, pre-Rockall, pre-Baylor, and A + B scores, and the predictive accuracy of each scoring system was measured by the area under the receiver-operating curve (AUC). Pairwise AUC comparisons were also performed between combinations of two different scoring systems using the nonparametric approach developed by DeLong et al. [9]. The *p*-value was adjusted through Bonferroni-adjusted significance tests for pairwise comparisons. From the AUC curves, the cutoff with the best relationship between sensitivity and specificity was used to recalculate sensitivity, specificity, positive likelihood ratio (PLR), and negative likelihood ratio (NLR) for each score, to make scores comparable. The Youden index was also calculated to measure the clinical diagnostic ability of each score [10,11]. The study was completed with 95% confidence interval (CI). Statistical significance was accepted as $P < 0.05$.

3. Results

3.1. Patient characteristics

Among the 1332 consecutive patients who presented with a definition of acute UGIB during the past 4 years, 937 patients were excluded, according to the exclusion criteria. A total of 395 patients with acute UGIB were retrospectively enrolled (Fig. 1). These patients were initially admitted to the ED and subsequently transferred to the Division of Gastroenterology. Data from the initial admission to the ED were collected in all patients and used for the calculation of scores. Only 1% of the laboratory values or vital signs required were not available for these patients. Patient characteristics are described in Table 1.

Table 1
Baseline characteristics and outcome measures of patients with acute UGIB.

Baseline characteristics	Median (IQR) or n (%)
Patient characteristics	
Age	65.0(50.0–77.0)
Male, n (%)	274(69.4)
Presenting symptoms	
Presented with hematemesis, n (%)	149(37.7)
Presented with melena, n (%)	258(65.3)
Presented with syncope, n (%)	13(3.3)
Clinical parameters	
Heart rate (beats/min)	90.0(86.0–98.0)
SBP (mm Hg)	106.0(100.0–120.0)
DBP (mm Hg)	60.0(55.0–70.0)
Laboratory results	
Hb (mg/dL)	86.0(73.0–99.0)
Platelete count (/dL)	164.0(103.0–211.0)
HCT	0.257(0.221–0.298)
Total bilirubin (mg/dL)	13.7(9.0–18.7)
ALT (mg/dL)	19.0(13.0–33.0)
ALB(mg/dL)	31.0(27.0–36.0)
BUN (mg/dL)	7.3(5.0–11.2)
Cr (mg/dL)	64.0(33.0–84.0)
INR	1.11(1.02–1.26)
Etiology of bleeding	
Peptic ulcer, n (%)	225(57.0)
Varices, n (%)	83(21.0)
Malignancy, n (%)	31(7.8)
Gastritis/erosions, n (%)	22(5.6)
Others (Mallory-Weiss, Erosive duodenitis, Oesophagitis etc.), n (%)	43(10.9)
Comorbid illnesses	
Liver disease, n (%)	109(27.6)
Cerebrovascular disease, n (%)	55(13.9)
Cancer, n (%)	48(12.2)
Renal disease, n (%)	37(9.4)
Congestive heart failure, n (%)	61(15.4)
Outcomes	
Rebleeding, n (%)	58(14.7)
Surgical intervention, n (%)	8(2.0)
Transfusion requirements, n (%)	68(17.2)
Length of hospital stay (d), median (IQR)	10.5 (6.0–21.0)
Mortality, n (%)	41(10.4)

Abbreviations: SBP, systolic blood pressure; DBP, diastolic blood pressure; Hb, hemoglobin; HCT, hematocrit; ALT, alanine aminotransferase; ALB, albumin; BUN, blood urine nitrogen; Cr, creatinine; INR, international normalized ratio.

Table 2
Distribution of patients and 30-day mortality in each risk class of predictive rules.

Risk groups	Number of patients ($N = 395$)	30 day mortality ($N = 41$)
AIMS65 score		
0	120(30.4)	1(0.8)
1	144(36.5)	3(2.1)
2	87(22.0)	8(9.2)
3	31(7.8)	16(61.3)
4	11(2.8)	11(100)
5	2(0.5)	2(100)
p-Value		<0.001
Blatchford score		
0–5	43(10.9)	1(2.3)
6–12	262(66.3)	8(3.1)
13–23	90(22.8)	32(35.6)
p-Value		<0.001
Pre-Rockall score		
0–2	200(50.6)	14(7.0)
3–4	127(32.2)	11(8.7)
5–7	68(17.2)	16(23.5)
p-Value		<0.001
Pre-Baylor score		
0–5	184(46.6)	20(10.9)
6–10	151(38.2)	12(7.9)
11–15	60(15.2)	9(15)
p-Value		>0.05

All data are numbers (%) unless stated otherwise. *p*-Value (χ^2 test for 30-day mortality).

The median age was 65.0 years (interquartile range 50.0–77.0), with 69.4% being men. The etiologies of acute UGIB included peptic ulcer (57.0%), varices (21.0%), malignancy (7.8%), gastritis/erosions (5.6%), and others (10.9%). More than half (65.3%) of enrolled patients presented with melena, 109 (27.6%) patients had a history of liver disease while 48 (12.2%) showed evidence of cancer. Additionally, 58 patients (14.7%) experienced rebleeding, and 67 patients (17.0%) received transfusion and only eight patients (2.0%) underwent surgical intervention, respectively. The median duration of hospitalization was 10.5 days (interquartile range 6.0–21.0). Forty-one patients died within 30 days of admission (mortality 10.4%).

3.2. Comparison of scoring systems in predicting mortality

The patient distribution and 30-day mortality in the AIMS65 score of the predictive rules are shown in Table 2. The different risk classes of the other three scores were categorized into three risk groups according to our study methodology. A significant trend in mortality was seen with each increasing score except the pre-Baylor score, respectively.

Receiver-operating characteristic curves yielded an AUC of 0.907 (95% CI 0.874–0.934) for the AIMS65 score in predicting 30-day mortality. The AUCs for each scoring system in predicting mortality are shown in Table 3 and Fig. 2. The Blatchford score also showed a slightly higher accuracy for predicting mortality 0.870 (CI 0.833–0.902). According to

Table 3
Area under the receiver-operating curve of scoring systems for predicting the 30- day mortality.

Test result variable(s)	Area	95%confidence interval	*p*-Value
AIMS65 score	0.907	0.874–0.934	<0.001
Blatchford score	0.870	0.833–0.902	<0.001
Pre-Rockall score	0.709	0.662–0.754	<0.001
Pre-Baylor score	0.523	0.472–0.573	>0.05
A + B score	0.953	0.927–0.972	<0.0001

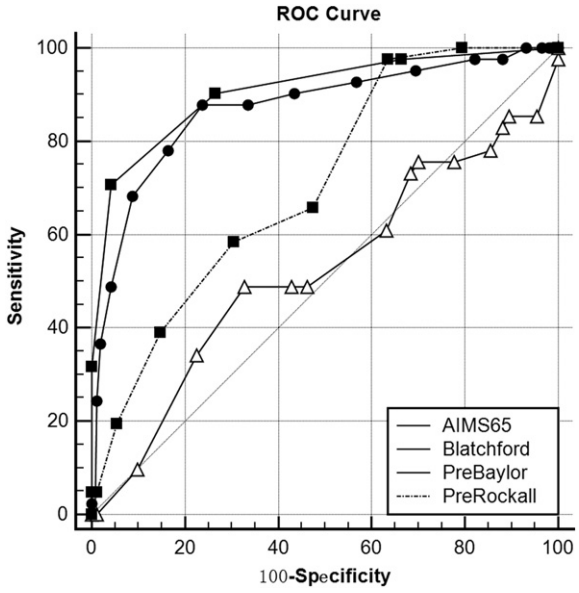

Fig. 2. ROC curves comparing the prediction of 30-day mortality in patients with acute upper gastrointestinal bleeding based on the AIMS65, Blatchford, preendoscopic Rockall, and preendoscopic Baylor scores.

the area under the curve in ROC analysis, predicted mortality rates of AIMS65, Blatchford, and pre-Rockall score results were found to be statistically significant for estimation of mortality ($P < 0.001$). The pre-Baylor score mortality results with an AUC of 0.523 (CI 0.472–0.573, $P > 0.05$) were not found to be statistically significant for the estimation of mortality (Table 3, Fig. 2). As the AIMS65 score and Blatchford score were combined as a single predictor (A + B), the mortality rates resulted in an AUC of 0.953 (CI 0.927–0.972, $P < 0.0001$) (Table 3, Fig. 3).

Comparison of ROC analysis of these four scores showed that the AIMS65 score was superior to the pre-Rockall score in terms of predicting mortality ($P < 0.001$), as was the Blatchford score ($P < 0.001$). There was no significant difference in the area under the ROC curves between the AIMS65 score and the Blatchford score ($P > 0.05$) (Table 5, Fig. 2).

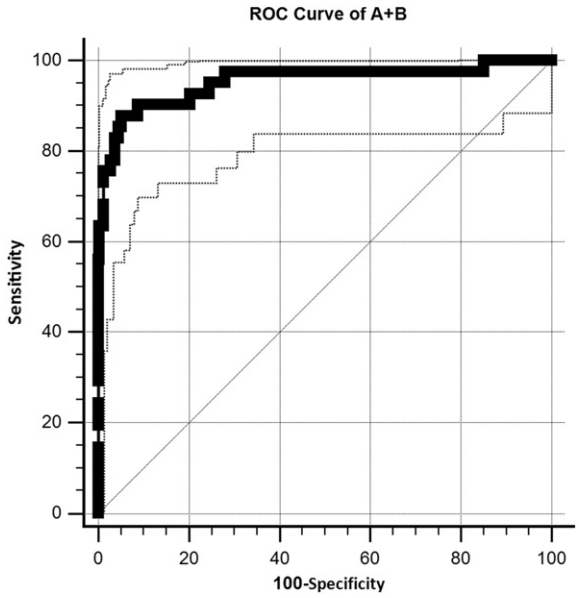

Fig. 3. Discriminative ability of the combination system (A + B) for the prediction of mortality, expressed as AUC for different variables obtained from a logistic regression model.

The cutoff values that maximized the sum of the sensitivity and specificity for predicting mortality in each score were generated from the receiver-operating characteristic curves, and were selected for further analysis. As shown in Table 4, the cutoff for the AIMS65 score was determined as 2.5. At this value, the sensitivity was 70.73% and specificity was 95.76%. The cutoff for the Blatchford score was determined as 11.5. The sensitivity was 87.80%, specificity was 76.27% of this value. At this value, the cutoff value that maximized the ability to predict mortality was 1.5 for the pre-Rockall score and 3 for the pre-Baylor score.

Table 4 reveals the cutoff score, Youden index, sensitivity, specificity, positive likelihood ratio, and negative likelihood ratio of each score used in identifying patients with acute UGIB who died.

4. Discussion

Acute UGIB is one of the most important emergency conditions in the ED setting. Despite improvement of intensive care technologies and advancements in endoscopic treatment of UGIB, mortality remains a significant problem. In our study, the all-cause mortality rate (about10. 4%) is comparable to rates reported in other studies which amount to 10% [12,13]. Acute UGIB is an emergency that may need early treatment; consequently, accurate risk stratification is the key to appropriately managing patients with acute UGIB in the ED.

Because medical treatment in the ED aims to quickly prevent death, facilitate healing, and prevent complications, we believe that identifying patients at high risk for death is more important than other concerns such as recurrent bleeding. Further, some patients identified to be at high risk for death may be prioritized for blood transfusions and hospital admissions after UGIB.

In this study, we compared the accuracy of three representative prognostic multifactorial scoring systems, including two without endoscopic diagnosis plus the new AIMS65 scoring system, in a retrospectively collected cohort of patients with acute UGIB. The results show that all the prognostic tools except the pre-Baylor score functioned well to predict 30-day mortality in ED patients with acute UGIB.

Our study also demonstrates that the cutoff value that maximized the ability to predict 30-day mortality was 2.5 for the AIMS65 score, 11.5 for the Blatchford score, and 1.5 for the pre-Rockall score, which had a different slightly from the study by Kallan et al., in which the cutoff values were 2.5, 12.5, and 4.5, respectively [14]. The reasons for the differences in cutoff values can be categorized under four points including ethnicity, etiology, treatment protocol before endoscopy, and the guidelines used to determine whether endoscopic treatment was required [15].

Leading to an optimal cutpoint of 0.66, patients with an AIMS65 score >2.5 are classified as “emergency”; this corresponds to a specificity of 95.76% and a sensitivity of 70.73%. It is obvious that the AIMS65 score has moderately good screening value (specificity of 95.76%), but it may be not good enough to be used alone (sensitivity of 70.73%) for the prediction of nodal involvement. It may supplement other scores such as the Blatchford score. To verify this theory, we combined the AIMS65 score and the Blatchford score as a single predictor (A + B). Overall, A + B is a more powerful marker for predicting death (a Youden index of 0.79 vs. 0.66 for the AIMS65 score).

As the likelihood ratio (LR) is desirable for any diagnostic study [16], we did this, too: for a positive result of the AIMS65 score, the LR was 16.69, while for a negative result, the LR was 0.31; the AIMS65 score appears to be more valuable for ruling out death, and not good at all for predicting (which corresponds to its acceptable sensitivity and poor specificity). We believe that, with appropriate validation, the AIMS65 score could ultimately benefit both patients and healthcare systems by ensuring appropriate admissions, targeting those who need early management, and diminishing unnecessary admission to intensive care. In contrast, the LR was 3.70 (positive) and 0.16 (negative) for the Blatchford score, 1.53 (positive) and 0.067 (negative) for the pre-Rockall score, and 1.49 (positive) and 0.76 (negative) for the pre-

Table 4
Cutoff score, Youden index, Sensitivity, specificity, PLR, and NLR of different scoring systems in predicting the 30-day mortality.

Test result variable(s)	Cutoff score	Youden index (J) (95%CI)	Sensitivity (95%CI)	Specificity (95%CI)	PLR (95%CI)	NLR (95%CI)
AIMS65	2.5	0.66(0.52–0.76)	70.73(54.5–83.9)	95.76(93.1–97.6)	16.69(9.8–28.4)	0.31 (0.2–0.5)
Blatchford	11.5	0.64(0.50–0.72)	87.80(73.8–95.9)	76.27(71.5–80.6)	3.70(3.0–4.6)	0.16(0.07–0.4)
Pre-Rockall	1.5	0.34(0.24–0.40)	97.56(87.1–99.9)	36.44(31.4–41.7)	1.53(1.4–1.7)	0.07(0.01–0.5)
Pre-Baylor	3	0.16(0.08–0.25)	48.78(32.9–64.9)	67.23(62.1–72.1)	1.49(1.1–2.1)	0.76(0.6–1.0)
A + B	0.11	0.79(0.63–0.86)	90.24(76.9–97.3)	88.42(84.6–91.6)	7.79 (5.7–10.6)	0.11 (0.04–0.3)

Abbreviations: PLR, Positive Likelihood Ratio; NLR, Negative Likelihood Ratio; A + B, Combine AIMS65 and Blatchford scores as a single predictor by using a logistic regression model.

Baylor score, respectively. The LR for A + B was 7.79 (positive) and 0.11 (negative). It would therefore seem valid to use A + B to stratify risk in ED patients undergoing acute UGIB; however, it is important to present this as a derivation rather than a validation component of our study.

The AIMS65 score is a newly developed prognostic scoring system which was reported to perform well in preliminary studies, especially in the early identification of patients with UGIB at increased risk of in-hospital mortality [4]. AIMS65 scores use physical examinations, vital signs, routine laboratory data, and age to derive a five-point score, so it can be applied quickly and easily without the need for urgent endoscopy in the ED. Similarly, the Blatchford score is also based on simple clinical and laboratory parameters, and does not require endoscopy. However, the Blatchford score is not considered useful for routine clinical practice because of its limitations, including that it is weighted and assigns points to elements in a patient's medical history, some of which lack clear definition [17].

The preendoscopic Rockall score (range, 0–7) uses only clinical data available immediately at presentation, which are related to the severity of the bleeding episode (systolic blood pressure and pulse) and to the patient (age and comorbidities) [18]. Even though the preendoscopic Rockall score is a simplified version of the Rockall score, which was originally derived to predict in-hospital mortality; it still appears useful for identifying high-risk patients. The reason may be that the majority of our enrolled patients were elderly (median age 65.0), so there might be more chance of them having comorbidity and shock. As formerly reported, advanced age is considered an important risk factor for mortality in patients with acute UGIB [19]. According to a recently published retrospective study that included 335 elderly patients with UGIB, the author found that the post-endoscopic Rockall score appeared less sensitive and less specific than the preendoscopic Rockall score [14].

The AIMS65 and Blatchford scores outperformed both the pre-Rockall score and the pre-Baylor score in two ways. First, and reassuringly, their stratification of mortality is more clinically useful and their parameters identify a genuinely low-risk group of patients, whereas the other two do not. Second, they performed better with respect to most of the other performance criteria and had the greatest AUC in our analyses. The AIMS65 score was previously shown to be superior to the Blatchford score for predicting mortality [20]. However, in our study, the difference of performance between these two scores might be trivial and because it had no statistical significance.

The disappointing performance of the pre-Baylor score in the prediction of mortality might be explained partly by the fact that this risk scoring system was originally developed for the prediction of rebleeding and not for the prediction of mortality [7]. Risk factors predicting rebleeding are slightly different from those predicting mortality, with the most common ones being endoscopic stigmata of recent hemorrhage (SRH), endoscopic diagnosis, and location of the bleed. Saeed et al. applied this scoring system to an external patient group who presented with major ulcer hemorrhage, and found higher rates of rebleeding in high-risk patients, compared with low-risk patients [21].

The ease of using each tool in clinical practice should also be considered. An ideal risk score should be easy to calculate, and can be calculated soon after the initial evaluation of patients with acute UGIB [22]. It has been proposed that the primary advantage of the Blatchford score to the "traditional" scoring systems is simplicity [23]. However, our experience of this study is that the calculation of the Blatchford score is more complicated than the AIMS65 score. The AIMS65 score requires only three bedside and two laboratory criteria. Although the laboratory results may delay a full assessment in the ED, our study has shown that these two results can be obtained within 30 min. Although all the parameters can be measured at bedside, the Blatchford score requires two clinical and two laboratory criteria as well as an assessment of four conditions (melena, syncope, hepatic disease, and heart failure). As a result, it is relatively more complicated.

4.1. Limitations

The present study had some limitations. First, this is a retrospective, single-center study, and the data were collected from a computer database and medical records. As a result, there might be a selection bias. To resolve these problems, we collected all data needed through a joint review of medical records by two principal investigators. Second, the present study did not take into account the scores for several subgroups of patients with different etiologies and epidemiologies. For example, there are 82 DALYs per 100,000 in China vs. 32 in the US from peptic ulcer disease, but 338 from cirrhosis in China vs. 463 in the US [24]. This may affect the test characteristics via spectrum bias. The third limitation is the impact of treatment protocol; China has some different drug options compared with many US institutions (such as PPI and somatostatin), and these may cause some external validity problems. However, we believe these drug options would not have much influence on the results of our study [25]. Furthermore, the sample frame of this analysis is drawn from those admitted with a diagnosis of acute UGIB, which is a similar but not identical population to that faced by the emergency clinician when deciding how to dispose a patient who presents with an upper GI bleed in the emergency department. Cautious application of these rules as well as further validation is advised.

Table 5
Pairwise comparison of AIMS65, Blatchford, preRockall and PreBaylor scores in predicting accuracy.

Test result variable(s)	Area difference	*Z*- value	*p*-Value	Bonferroni-corrected *p*-value
AIMS65 ~ Blatchford	0.037	1.816	=0.0693	>0.05
AIMS65 ~ Pre-Rockall	0.198	5.571	<0.0001	< 0.05
Blatchford ~ Pre-Rockall	0.161	4.209	<0.0001	< 0.05
AIMS65 ~ PreBaylor	0.384	5.522	<0.0001	< 0.05
Blatchford ~ Pre-Baylor	0.347	4.729	<0.0001	< 0.05
Pre-Baylor ~ Pre-Rockall	0.186	2.274	=0.0230	>0.05

DeLong et al., 1988 [9].

5. Conclusion

The AIMS65 and Glasgow-Blatchford scores performed better in terms of predicting mortality of patients with acute UGIB compared with the preendoscopic Rockall and the preendoscopic Baylor scores assessed in the ED. For the time being, the AIMS65 score might be the most appropriate tool for risk stratification and could serve as an indicator of close monitoring, or early consultation for emergency intervention in the ED, because its components are clinically relevant and easier to obtain. There is clearly a need for corroboration of our results and prospective studies are needed to validate the performance of these scales in patients with acute UGIB in the ED.

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