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Comparison of risk scoring systems for the prediction of clinical outcomes in nonvariceal upper gastrointestinal bleeding: a prospective randomized study

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ABSTRACT

Aim: Non-variceal upper gastrointestinal bleeding (UGIB) is a typical gastrointestinal emergency. Detection of high-risk patients is crucial to organize medical care accordingly. This study aims to compare risk assessment scores for their ability to predict prognosis in nonvariceal-UGIB.

Material and Method: Adult patients with nonvariceal-UGIB applied to the emergency department were recruited prospectively. Clinical and Complete Rockall score (RS), Glascow-Blatchford score (GBS), AIMS65, and T-Score were compared for endpoints: (1) need for endoscopic treatment, (2) hospitalization, (3) rebleeding, and (4) 30-day mortality.

Results: A total of 469 patients were included. While 133 (28.0%) patients were discharged within 24 hours, 336 (72.0%) were hospitalized. The median length of hospital stay was 6.6 (0.0-8.0) days. Endoscopic treatment and transfusion were required in 109 (23.0%) and 255 (54.0%) patients, respectively. Rebleeding was observed in 36 (8.0%) patients. The 30-day mortality rate was 11.0 %. Complete Rockall score was superior among all risk scores regarding the prediction of the need for endoscopic treatment (AUC: 0.707, $p<0.001$) and hospitalization (AUC: 0.678, $p<0.001$). AUC values of AIMS65, Clinical RS, Complete RS, GBS, and T-score were 0.688, 0.601, 0.634, 0.631, and 0.651, respectively ($p>0.05$). AIMS65 score (AUC: 0.810, $p<0.05$) was superior to the clinical RS and GBS at predicting 30-day mortality. However, there was no difference between the AIMS65 score and the other scores of areas under the curve ($p> 0.05$).

Conclusion: Complete RS and AIMS65 scores are valuable tools to determine UGIB-related endpoints (need for intervention, hospitalization, rebleeding, and mortality). Identifying high-risk patients using the risk scoring systems and performing endoscopy in this group may improve clinical outcomes, while their sensitivity is inadequate in the low-risk patients.

Keywords: Gastrointestinal hemorrhage, endoscopy, risk assessment, prognosis

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is one of the most common gastrointestinal emergencies confronted by clinicians in emergency departments (ED). Early endoscopy for the management of UGIB has gained general acceptance. It is useful in patients with persistent active bleeding and preventing recurrent bleeding, which can significantly reduce morbidity and mortality (1-5). The optimal endoscopy timing for patients with UGIB has been defined by several evidence-based guidelines and expert reviews within the first 24 h after admission following hemodynamic resuscitation (6-8).

However, the applicability of this recommendation is not always achievable. One-fifth of all patients with peptic ulcer bleeding had a clean ulcer base at the endoscopic examination. The risk of rebleeding is low (3%) in these patients, and endoscopic management could easily be performed without hospitalization (9-13). Therefore, the suggestion of early endoscopy for patients presenting with UGIB to the ED is doubtful. Numerous scoring systems have been designed to classify high-risk patients and differentiate them from lower-risk patients (14-22). Gastrointestinal system bleeding risk score systems have been proposed to predict early clinical outcomes, including the need for endoscopic treatment and hospitalization, rebleeding, and mortality (23). Despite the benefits mentioned above, employing these scores in clinical management still requires further studies.

In this prospective single-center study, we aimed to

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compare five risk assessment scores (clinical and complete Rockall score (RS), Glasgow Blatchford score (GBS), AIMS65, and T-Score for their ability to predict significant endpoints in adult patients with non-variceal UGIB.

MATERIAL AND METHOD

The study was carried out with the permission of Ankara City Hospital Scientific Researches Ethics Committee (Date: 02.09.2020, Decision No: E1/1051/2020). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Patients

Data were collected from consecutive adult patients (≥18 years) with symptoms and signs of UGIB admitted at the hospital between February-2019 and February-2020. UGIB is the presence of hematemesis, melena, or bloody nasogastric aspirate. All consequent patients who underwent upper gastrointestinal endoscopy with UGIB diagnosis were enrolled prospectively following an approved informed consent. Patients presenting with variceal bleeding and patients without informed consent forms were excluded from the study.

Management

All patients presenting with upper gastrointestinal bleeding were initially evaluated in the emergency department and were consulted by the gastroenterologist for bleeding. The clinical RS, GBS, AIMS65, and the T-score were calculated as pre-endoscopic, and Complete RS was calculated as post-endoscopic score by a gastroenterologist. Pantoprazole infusion (8mg/h following 80mg bolus) was promptly administered to all patients with UGIB. Transfusion with erythrocyte suspension (ES) was applied to patients with a hemoglobin level of less than 8g/dL. Blood transfusion was given to patients with a low hemoglobin level of less than eight g/dl. For patients with a hemoglobin (Hg) level between 8 and 9g/dl, transfusion was performed based on the patient's age, comorbidities, and hemodynamic status.

Endoscopy was performed within the first 12 or 24 hours based on the patient's hemodynamic status, decrease in hemoglobin level despite blood transfusion, and presence of active bleeding findings. Furthermore, an endoscopy was performed within the first 24 hours in patients who did not have evidence of severe bleeding, preferably to make an early discharge decision. Endoscopy time was calculated based on the admission time to the ED. Endoscopic treatment was performed in the presence of high-risk stigmata of recent hemorrhage (SRH): actively bleeding (spurting /oozing) or non-bleeding visible vessels. In case of endoscopic treatment failure, patients were consulted for interventional radiology or surgery. The clinician made the decision to be discharged or hospitalized based on the initial evaluations and endoscopy findings. The patients followed up for 30 days.

Hemodynamic status was classified as stable, intermediate, and unstable based on systolic blood pressure (SBP) and pulse rate (beats/min). SBP <90 mm hg and pulse >110 beats/min was considered unstable, SBP: 90-99 mm/Hg and pulse: 100-110 (beats/min) as intermediate, SBP >100 mm/Hg and Pulse <90 beats/min as stable. Cut-off values for blood pressure and pulse are based on the values determined in GBS, AIMS65, and T-scores (15,16, 20).

Outcomes

The primary outcomes of the presented study were as follows: (1) Need for endoscopic treatment, (2) Hospitalization, (3) Rebleeding, and (4) 30-day mortality. Rebleeding was defined as more than a 2 g/dl decrease in hemoglobin along with signs of bleeding. Rebleeding was confirmed by a second look endoscopy (presence of fresh blood into the stomach or duodenum, active bleeding or SRH), and mortality was defined as any death occurring within 30 days after bleeding.

Patients were divided into low- and high-risk groups. High-risk patients were determined as the presence of one of the following necessities: blood transfusion, surgery, or endoscopic or radiologic interventions to control the bleeding. Conversely, the absence of any interventions mentioned above was determined as low-risk.

Data Collection

In addition to the bleeding-related symptoms (hematemesis, coffee-ground vomit, melaena, syncope), data regarding past medical history, hemodynamic status, and laboratory and endoscopic findings were collected prospectively. Data Hospitalization, blood transfusion, endoscopic treatment, interventional radiology or surgery, rebleeding, and 30-day mortality were registered prospectively using the hospital's electronic civil medical registration system. Patients discharged within 24 hours were followed up with outpatient clinic visits after one week and at the end of the fourth week.

Statistical Analysis

The SPSS 23.0 Statistical Package Program for Windows (SPSS, IBM, Chicago, IL, USA) was used for statistical analysis. The Kolmogorov-Smirnov test was used to test the normality of distributions. Categorical data are presented as percentages and continuous variables are presented as mean ± standard deviation (SD) for variables with normal distribution or median and interquartile range (IQR) for variables with abnormal distribution. The statistical comparisons of continuous variables were performed using independent samples t-test or Mann-

Whitney U test regarding the distribution pattern. The correlation between score systems and length of stay in the hospital was evaluated using Spearman's test. Receiver operating characteristic (ROC) curves for disease outcomes were calculated to evaluate the detection ability of score systems. The area under the ROC curve (AUC) was used as an overall measure of discrimination. ROC was compared using the De Long test* (Medcalc® Software, Mariakerke, Belgium). A two-tailed p-value of <0.05 was considered statistically significant.

*DeLong ER, DeLong DM, Clarke-Pearson DL (1988) Comparing the areas under two or more correlated receiver operating characteristic curves: a nonparametric approach. Biometrics 44:837–845

RESULTS

Patient Characteristics and Baseline Scores

A total of 578 patients presented to the emergency department with acute UGIB, of whom 109 patients were excluded from the study for the following reasons: 54 patients were acute variceal UGIB, 38 patients were unsuitable for endoscopy due to poor prognosis or refused endoscopy, and 17 patients had missing data. The remaining 469 patients were included in the study (**Figure 1**).

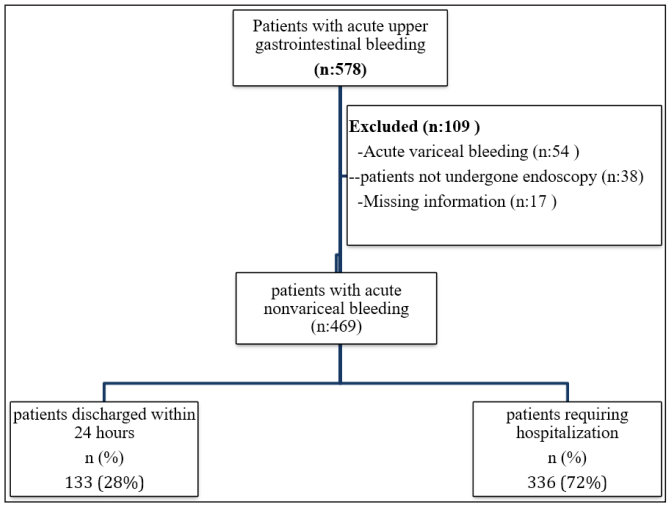

Figure 1. Flowchart of inclusion criteria and followed up hospitalized or outpatients presenting with UGIB.

Patients' characteristics, comorbidities, and endoscopic findings are shown in **Table 1**. The median age was 67.0 (50.5-78.5), and 315 (67%) were male. 239 (51%) of the patients were presented with hematemesis, 319 (68%) with melena, 129 (28%) with melena and hematemesis, and 77 (16%) patients also had hematochezia and/or syncope. While 100 (21%) of the patients had a previous history of UGIB, 16 (3%) had previously undergone gastric surgery. Of the patients with UGIB, 90 (19%) were taking NSAIDs, 139 (30%) patients were antithrombotic and 72 (16%) patients were using anticoagulants.

Table1. Patients' characteristics, comorbidities, medications and endoscopic findings.

	Total (N= 469)
Median age, (years)	67.0 (50.5-78.5)
Gender, (male)	315 (67%)
Presenting symptoms	
Hematemesis	239 (51%)
Melaena	319 (68%)
Hematemesis/melaena	129 (28%)
Comorbidities	
Cardiovascular diseases	101 (22%)
Cerebrovascular diseases	39 (8%)
Chronic renal disease	51 (10%)
Hypertension	209 (45%)
Chronic liver disease	10 (2%)
Malignant diseases	56 (12%)
Previous episode of UGIB	100 (21%)
Previous GIS surgery	16 (3%)
Medication	301 (65%)
NSAIDs	90 (19%)
Antithrombotic agent	
Aspirin	126 (27%)
DAPT	13 (3%)
Anticoagulants	
Warfarin	41 (9%)
NOAC	31 (7%)
Pulse > 100 (beats/min)	198 (42%)
Systolic blood pressure < 90mmHg	34 (7%)
Hemoglobin level on admission (g/dL)	9.9 ± 2.9
BUN level on admission (mg/dl)	71.0 (47.0-113.0)
Endoscopic findings	
Peptic ulcer	
Gastric	77 (16%)
Duodenal	157 (34%)
Erosive esophagitis/ulcer	45(9%)
Upper gastrointestinal malignancy	37 (8%)
Mallory–Weiss syndrome	16 (3%)
Erosive gastropathy/ duodenopathy	73 (16%)
Others (angioectasia, Cameron lesion, dieulafoy lesion, etc.)	43 (9%)
Lesion not visualized	22 (5%)

Results are expressed as: mean + SD or median (IQR) or frequency (%). UGIB: upper gastrointestinal bleeding, GIS: gastrointestinal system, NSAIDs: Non-steroidal anti-inflammatory drugs, NOAC: New generation oral anticoagulant, DAPT: dual antiplatelet therapy, BUN: blood urea nitrogen.

Among the study population, 133 (28%) patients were discharged within 24 hours, while the remaining 336 (72%) patients were hospitalized. The median length of hospital stay was 6.6 (0-8.0) days. Endoscopic treatment was required in 109 (23%), and rebleeding was observed in 36 (8%) patients. The 30-day mortality rate was 11%. Patients' clinical outcomes and scoring systems at admission or after endoscopy are listed in **Table 2**. Median score values evaluated at admission or after endoscopy in patients' clinical RS was 3.0 (1.0-4.0), complete RS was 5.0 (3.0-6.0), GBS was 9.0 (6.0-12.0), AIMS65 score was 1.0 (0-2.0), and T-score was 9.0 (8.0-11.0) (**Table 2**).

Comparison of Scores' Ability to Predict Outcomes

The outcome prediction ability of the scoring systems is listed in **Table 3**. In addition, a comparison was made for the area under the curve for all scoring systems. The ability to predict the need for endoscopic treatment, hospitalization, rebleeding, and mortality in low and high-risk patients according to the cut-off value of all scoring systems is shown in **Table 4**.

Complete Rockall score was superior among all risk scores regarding the prediction of the need for endoscopic treatment (AUC:0.707, %95 CI: 0.663-0.743, for all scores p<0.001) and hospitalization (AUC: 0.678, %95 CI: 0.633-0.720). Regarding the prediction of hospitalization, no difference was found in AUROC between the Complete Rockall score (AUC: 0.678) and GBS (AUC: 0.638). While the AIMS65 score had the highest discriminative ability (AUC: 0.688) at predicting rebleeding compared with the Clinical RS,

Table 2. Patients' clinical outcomes and risk scoring systems at admission or after endoscopy.

	Total (N=469)
Discharged within 24 hours	133 (28%)
Hospitalization	336 (72%)
Clinical hospitalization	239 (51)
Intensive care unit	97 (21)
Length of stay (median)	6.6 (0-8.0)
Need for Endoscopic intervention	109 (23%)
Heater coagulation	25 (5%)
Argon plasma coagulation	9 (2%)
Hemoclips	75 (16%)
Surgery/interventional radiology	8 (2%)
Need transfusion (U)	255 (54%)
Rebleeding (during hospitalization)	36 (8%)
30-day mortality	50 (11%)
Scores	
Clinical Rockall Score	3.0 (1.0-4.0)
Complete Rockall Score	5.0 (3.0-6.0)
Glasgow Blatchford Score	9.0 (6.0-12.0)
AIMS65	1.0 (0-2.0)
T-score	9.0 (8.0-11.0)

Results are expressed as: median (IQR) or frequency (%).

Table 3. Ability of risk scoring systems to predict clinic outcomes.

	AUROC (95% CI)	Complete Rockall P (95% CI)	Glasgow Blatchford P (95% CI)	AIMS65 P (95% CI)	T score P (95% CI)
Need for endoscopic treatment					
Clinical Rockall	0.536 (0.489-0.582)	<0.001 (0.144-0.197)	0.116 (-0.012-0.115)	0.888 (-0.042-0.049)	0.308 (-0.028-0.090)
Complete Rockall	0.707 (0.663-0.748)	-	<0.0001 (0.061-0.178)	<0.001 (0.127-0.221)	<0.001 (0.084-0.195)
Glasgow Blatchford	0.587 (0.541-0.632)	-	-	0.067 (-0.003-0.112)	0.368 (-0.023-0.064)
AIMS65	0.533 (0.486-0.579)	-	-	-	0.262 (-0.025-0.093)
T score	0.567 (0.520-0.612)	-	-	-	-
Hospitalization					
Clinical Rockall	0.589 (0.543-0.634)	<0.001 (0.064-0.113)	0.103 (-0.009-0.107)	0.738 (-0.040-0.056)	0.309 (-0.027-0.086)
Complete Rockall	0.678 (0.633-0.720)	-	0.163 (-0.016-0.096)	0.001 (0.030-0.131)	0.032 (0.005-0.114)
Glasgow Blatchford	0.638 (0.592-0.681)	-	-	0.173 (-0.017-0.098)	0.390 (-0.024-0.062)
AIMS65	0.597 (0.551-0.642)	-	-	-	0.472 (-0.036-0.079)
T score	0.618 (0.573-0.663)	-	-	-	-
Rebleeding					
Clinical Rockall	0.601 (0.555-0.645)	0.221 (-0.020-0.086)	0.581 (-0.077-0.137)	0.023 (0.011-0.163)	0.265 (-0.0.38-0.138)
Complete Rockall	0.634 (0.588-0.678)	-	0.954 (-0.102-0.108)	0.191 (-0.027-0.135)	0.714 (-0.073-0.107)
Glasgow Blatchford	0.631 (0.585-0.675)	-	-	0.254 (-0.041-0.155)	0.651 (-0.066-0.200)
AIMS65	0.688 (0.644-0.730)	-	-	-	0.362 (-0.045-0.125)
T score	0.651 (0.606-0.694)	-	-	-	-
Mortality					
Clinical Rockall	0.706 (0.662-0.747)	0.099 (-0.006-0.078)	0.383 (-0.052-0.135)	0.020 (0.016-0.192)	0.502 (-0.057-0.177)
Complete Rockall	0.742 (0.700-0.781)	-	0.090 (-0.012-0.168)	0.126 (-0.019-0.155)	0.882 (-0.077-0.089)
Glasgow Blatchford	0.664 (0.619-0.707)	-	-	<0.001 (0.065-0.226)	0.025 (0.008-0.134)
AIMS65	0.810 (0.771-0.844)	-	-	-	0.056 (-0.002-0.151)
T score	0.735 (0.693-0.775)	-	-	-	-

Table 4. Ability to Identify low risk and high-risk patients and outcome in prediction of need for endoscopic treatment, need for intervention, hospitalization, re-bleeding and 30-day mortality.

	Risk Scoring system	Cut-off	Patients, n, (%)	Need for endoscopic treatment, n, sensitivity (%) / specifity (%)	Hospitalization, n, sensitivity (%) / specifity (%)	Rebleeding, n, sensitivity (%) / specifity (%)	Mortality, n, sensitivity (%) / specifity (%)
Patients classified as low risk*	Clinical RS	0	83 (18)	21, 15.2 / 81.2	51, 15.2 / 75.9	4, 11.1 / 81.8	0, 0 / 80.2
	Complete RS	≤ 2	83 (18)	4, 2.9 / 76.1	43, 12.8 / 69.9	2, 5.6 / 81.3	1, 2.0 / 80.4
	GBS	≤ 1	26 (6)	3, 7.0 / 95.8	9, 2.7 / 87.2	0, 0 / 94.0	0, 0 / 93.8
	AIMS65	0	181 (39)	48, 34.8 / 59.7	116, 34.5 / 51.1	7, 19.4 / 59.8	3, 6.0 / 57.5
	T score	≥ 10	234 (50)	63, 45.7 / 48.2	157, 46.7 / 42.1	10, 27.8 / 48.3	9, 18.0 / 46.3
Patients classified as high risk*	Clinical RS	≥ 3	292 (62)	87, 63.0 / 38.2	218 64.9 / 35.1	27, 75.0 / 38.8	41, 82.0 / 40.1
	Complete RS	≥ 8	50 (11)	31, 22.5 / 94.2	43, 12.8 / 87.2	8, 22.2 / 90.3	14, 28.0 / 91.4
	GBS	≥ 7	337 (72)	114, 82.6 / 32.7	261 77.7 / 42.9	30, 83.3 / 29.1	48, 92.0 / 30.5
	AIMS65	≥ 2	136 (29)	43, 31.2 / 72.1	109 32.4 / 79.7	21, 58.3 / 73.4	37, 74.0 / 76.4
	T score	≤ 6	25 (5)	9, 6.5 / 95.2	19 5.7 / 95.5	4, 25.0 / 88.7	8, 16.0 / 95.6

(* patients classified as low risk and high risk according to risk scoring system).

Complete RS, GBS, and T score (AUC: 0.601, 0.634, 0.631, 0.651 respectively), there was no difference between all scores the area under the curve. AIMS65 score (AUC: 0.810, %95 CI: 0.771-0.844, p<0.05) was superior to the clinical RS and GBS at predicting 30-day mortality. Nevertheless, there was no difference between the AIMS65 score and the other scores of areas under the curve (p> 0.05) (**Table 3**).

The scores with the highest specificity and sensitivity for the need for endoscopic treatment in low-risk patients were the GBS (95.8%) and the T score (45.7%), respectively. In high-risk patients, the T score had the highest specificity (95.2 %), and the Glasgow Blatchford score had the highest sensitivity (82.6%) (**Table 4**).

The scores with the highest specificity and sensitivity for hospitalization in low-risk patients were GBS (87.2%) and T score (46.7%), respectively. In high-risk patients, the T score had the highest specificity (95.5%), and GBS had the highest sensitivity (77.7%).

The scores with the highest specificity and sensitivity for rebleeding in low-risk patients were GBS (94.0%) and T score (27.8%), respectively. In high-risk patients, Complete RS had the highest specificity (90.3%), and the GBS score had the highest sensitivity (83.3%). The scores with the highest specificity and sensitivity for mortality in low-risk patients were GBS (93.8%) and T score (18%), respectively. In high-risk patients, the T score had the highest specificity (95.6%), and the GBS had the highest sensitivity (92.0%).

DISCUSSION

Risk scoring systems can make it easier for the clinician to identify low- and high-risk patients presenting with UGIB. Risk scoring systems for UGIB are essential for identifying high-risk patients to provide intensive care, along with low-risk patients that can be easily managed on an outpatient basis. Previous studies have demonstrated the predictive values of these scores in terms of the need for interventions, prolonged hospitalization, and mortality (24). The clinical RS, GBS, AIMS65, and T-score are pre-endoscopic risk scores that include only clinical variables (25). These risk scores may determine to need for early endoscopy, the decision of early discharged, rebleeding, and mortality. The Complete RS includes both clinical and endoscopic variables (25,26). Pre-endoscopic and post-endoscopic scores were evaluated to determine the optimal risk scores in patients presenting with UGIB based on associated primary outcomes in the presented study.

We showed that in AUROC analysis, Complete RS had the highest discriminative ability to predict the need for endoscopic treatment. Complete RS may facilitate deciding whether to perform an endoscopy. GBS has been the best scoring system to predict the need for endoscopic treatment in previous studies (15, 25, 27). However, in this study, the Complete RS was superior among all risk scores in predicting of need for endoscopic treatment. We found that the GBS had the highest discriminative ability to predict the need for intervention; GBS appears to be the optimal scoring system for predicting the

need for intervention. These results supported previous studies and the European Society of Gastrointestinal Endoscopy recommended in patients with UGIB use of GBS in the last guideline (15, 32). When GBS score is 0 and 1, it means that the need for intervention is very low and early discharge decision can be made (27,28). The median GBS score in the current study was 9, the study population consisted mostly of high-risk patients, which may explain the low sensitivity of GBS in terms of need for endoscopic intervention.

Many studies have shown that scoring systems are insufficient to predict rebleeding (24, 30, 29). In our study AIMS65 score was best at predicting rebleeding compared with the other scores. This may reflect its ability to predict rebleeding in high-risk patients. Another critical concern is the identification of high-risk patient groups. Based on the AUROC analysis in our study, AIMS65 scored the highest discriminative ability at predicting 30-day mortality, respectively. Most of the patients in our study were in the high-risk patient group, and the ability of the scoring systems to predict mortality was significant. In literature, the mortality risk was considered high when more than two components of AIMS65 were present (16, 32). Hyett et al. (32) have reported the superiority of the AIMS65 score when compared to the GBS in predicting inpatient mortality. AIMS65 score is an acronymic risk score which incorporates albumin level, INR, altered mental status, systolic blood pressure and age >65. The rate of UGIB-related morbidity and mortality increases markedly with age (12, 17-19). Altered mental status, which is the components of the AIMS65 score, is frequently observed in elderly UGIB patients, and the fact that they are over the age of 65 may explain that the AIMS65 score is an optimal risk scoring system in the elderly group. However, we did not find any difference between the ability of the complete RS and T-score to predict 30-day mortality. Tammaro et al. (20) reported that the T-score could predict mortality with an accuracy similar to the GBS, especially when the T-score was six or less. Similarly, the complete RS was more than eight or more (14).

The optimal risk score is to divide patients into low-risk and high-risk groups. In the previous studies, cut-off values were determined for low-risk and low-risk patient groups (26, 33). We used these cut-off values as a basis. We found that the sensitivity of risk scoring systems was insufficient in the low-risk group, while GBS had a specificity of over 85% to evaluate all primary outcomes in low-risk patients. Unlike low-risk patient groups, the predictivity of risk scoring systems was significant in high-risk patients. In high-risk patients, GBS was the best scoring system with sensitivity above 77% to evaluate all primary outcomes. We noticed that while the sensitivity of GBS (score seven or more) was better in the high-risk group, this situation was insufficient for the low-risk group to predict this endpoint. Stanley et al. (25) reported that the sensitivity of GBS was low in the high-risk patient group, and the use of GBS in this group of patients was limited. This may be because most of the patients in their study were low-risk patients, unlike our study. In the present study, the T-score (score of six or less) was the best scoring system with specifications above 95% to predict the need for endoscopic treatment, need for intervention, hospitalization, and 30-day mortality in high-risk patients. The recently described T-score has been shown to have the ability to predict the need for intervention, rebleeding, and mortality (20, 34). GBS and T-score are simple calculable pre-endoscopic scores and may predict worse outcomes in high-risk patients, especially when endoscopy is unavailable.

The study's strength was standardized with high accuracy in calculating risk scoring systems Since it is a single-center prospective design and endoscopy is performed on all patients. The study's weakness was that most patients were in the high-risk patient group, resulting in many critical patients being sent to the hospital as it is a tertiary center. This may be the reason why the sensitivity of scoring systems is inadequate in the low-risk patient group.

CONCLUSION

Calculating Complete Rockall and AIMS65 scores is useful in determining UGIB-related endpoints (need for endoscopy, hospitalization, rebleeding, and mortality). GBS and T score have a higher sensitivity and specificity in detecting high-risk patients.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara City Hospital Scientific Researches Ethics Committee (Date: 02.09.2020, Decision No: E1/1051/2020).

Informed Consent: Written consent was obtained from the patient participating in this study.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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