DOI: 10.14744/cm.2026.20082
Compreh Med 2026;18(Suppl. 1):1-10

RESEARCH ARTICLE

Comparative Correlation of Rockall and Glasgow-Blatchford Scoring Systems with One-Month Mortality and Rebleeding in Non-Variceal Upper Gastrointestinal Bleeding

Nezihe Berrin Dodur Önalan[1], Mahmut Ozan Aydın[1], Cenk Özkan[1], Halil Alış[2]

[1]Department of General Surgery, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye
[2]Department of General Surgery, İstanbul Aydın University Faculty of Medicine, İstanbul, Türkiye

ABSTRACT

Objective: Upper gastrointestinal bleeding (UGIB) is a common and potentially life-threatening emergency. Risk stratification using composite scoring systems is essential for guiding clinical management. This study evaluated the correlations of the Rockall and Glasgow-Blatchford scoring (GBS) systems with one-month mortality and rebleeding in patients with non-variceal UGIB and compared their performance with individual clinical and laboratory parameters.

Materials and Methods: A retrospective analysis was performed using prospectively collected data from 1,030 patients with confirmed non-variceal UGIB admitted to a tertiary referral center between January 2001 and September 2005. Rockall and GBS scores were calculated for each patient. Correlations between clinical, laboratory, and endoscopic variables and study outcomes were assessed using Spearman's correlation analysis.

Results: The mean age was 54.1 years, and 69.8% of the patients were male. Follow-up data were available for 262 of the 1,030 patients because a considerable proportion of the cohort could not be reached; therefore, rebleeding and mortality analyses were conducted within this subset. Both scoring systems demonstrated statistically significant correlations with one-month mortality, with the Rockall score showing a stronger association (r=0.507 vs. r=0.425). Both scores also correlated with rebleeding (r=0.259 and r=0.247, respectively). Among individual parameters, hemodynamic stability showed the strongest correlation with mortality (r=−0.346), followed by age (r=0.332). Both systems showed stronger correlations than individual variables.

Conclusion: The Rockall score demonstrates a stronger correlation with mortality than the GBS in patients with non-variceal UGIB. Both systems showed stronger correlations than individual clinical parameters, supporting structured multivariable risk assessment. Hemodynamic stability and age are the most informative individual predictors of mortality.

Keywords: Glasgow-Blatchford score, non-variceal bleeding, one-month mortality, rebleeding, rockall score, upper gastrointestinal bleeding

How to cite this article: Dodur Önalan NB, Aydın MO, Özkan C, Alış H. Comparative Correlation of Rockall and Glasgow-Blatchford Scoring Systems with One-Month Mortality and Rebleeding in Non-Variceal Upper Gastrointestinal Bleeding. Compreh Med 2026;18(Suppl. 1):1-10.

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) represents one of the most common gastrointestinal emergencies encountered in clinical practice and is associated with significant morbidity and mortality despite continued advances in endoscopic and pharmacological management. Early and accurate risk stratification at the time of admission is paramount, as it directly influences clinical decision-making, the timing of endoscopic intervention, and the appropriate allocation of hospital resources. To this end, several composite scoring systems have been developed and validated over the past decades. Among these, the Rockall and Glasgow-Blatchford scores (GBS) have gained the widest clinical acceptance, with the former uniquely incorporating endoscopic findings alongside clinical and demographic parameters, whereas the latter relies solely on variables obtainable at the bedside before endoscopy.

Address for Correspondence: Mahmut Ozan Aydın, Department of General Surgery, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul, Türkiye
E-mail: op.dr.mahmutozanaydin@gmail.com **ORCID ID:** 0000-0002-7061-6957

Received date: 30.04.2026
Revised date: 06.05.2026
Accepted date: 02.06.2026
Online date: 14.10.2026

Comprehensive Medicine published by Kare Media.
OPEN ACCESS This is an open access article under the CC BY-NC license (http://creativecommons.org/licenses/by-nc/4.0/).

Despite their widespread use, the relative merits of these two scoring systems—and their performance compared with individual clinical and laboratory parameters—remain subjects of ongoing investigation. In this study, we aimed to evaluate the clinical correlations of the Rockall and GBS systems alongside a broad range of individual variables in patients with confirmed non-variceal UGIB, with the primary objective of identifying the most reliable predictors of one-month mortality and rebleeding.

MATERIALS and METHODS

This study was conducted between January 2001 and September 2005 in the Department of General Surgery at Bakırköy Dr. Sadi Konuk Training and Research Hospital. It represents a retrospective analysis of prospectively collected data. Ethics committee approval was obtained from Istanbul University of Health Sciences Kanuni Sultan Suleyman Training and Research Hospital Scientific Research Ethics Committee (Approval Number: 3, Date: 08.01.2025) and was conducted in accordance with the principles of the Declaration of Helsinki. Due to the retrospective nature of the study, the requirement for written informed consent was waived by the institutional ethics committee. Patients presenting with hematemesis, melena, or hematochezia were initially evaluated for suspected UGIB. The diagnosis of UGIB was established based on clinical findings, including rectal examination and nasogastric aspirate analysis, as well as endoscopic findings. Patients without available endoscopic data and those with endoscopically confirmed variceal bleeding were excluded. Following these exclusions, a total of 1,030 patients with confirmed non-variceal UGIB were included in the study.

Endoscopic evaluation was performed in all patients included in the study. Emergency endoscopy was performed in patients with ongoing bleeding and hemodynamic instability, whereas hemodynamically stable patients underwent endoscopy as early as feasible, generally within 24–48 hours. Endoscopic procedures were performed using a Pentax ESK-1000 videoendoscope, and findings were classified according to the Forrest classification. Patients with Forrest Ia, Ib, and IIa lesions underwent endoscopic injection therapy (sclerotherapy with 1:100,000 adrenaline injected into four quadrants surrounding the bleeding site). A second-look endoscopy was performed after 24 hours, and repeat injection therapy was administered in cases of rebleeding. Patients who failed endoscopic treatment and required ≥5 units of blood transfusion within 24 hours or remained hemodynamically unstable underwent emergency surgery. Patients were scheduled for repeat endoscopy at four weeks, when feasible, to assess ulcer healing and Helicobacter pylori status, during which morbidity, rebleeding, and mortality outcomes were evaluated. Eradication therapy was initiated when indicated. During hospitalization, patients received proton pump inhibitors or H2-receptor antagonists and were discharged with recommendations to continue medical therapy and discontinue nonsteroidal anti-inflammatory drugs and aspirin when applicable.

At admission, all patients were evaluated using two validated risk scoring systems, the Rockall score and GBS, to assess the risk of rebleeding and mortality. The Rockall score was calculated based on clinical and endoscopic parameters, including patient age, hemodynamic status (presence of hypotension and tachycardia), comorbid diseases, endoscopic diagnosis, and stigmata of recent hemorrhage observed during endoscopy. Detailed components and score allocations of the Rockall system are presented in Table 1.[1]

Table 1. Rockall scoring system for risk stratification in patients with UGIB

Rockall scores	Score
Age (years)	
<60	0
60–79	1
≥80	2
Hemodynamic status	
>100	1
Heart rate (bpm)	
Systolic blood pressure (mmHg)	
<100	2
Comorbidities	
Heart failure, ischemic heart disease	2
Renal failure, hepatic failure, metastatic cancer	3
Endoscopic signs (diagnostic)	
No lesion or Mallory–Weiss tear	0
Peptic ulcer, erosive disease, esophagitis	1
Cancer of the upper gastrointestinal tract	2
Endoscopic signs (hemorrhagic)	
Clean-base ulcer or flat, pigmented spot	0
Visible blood, active bleeding, visible vessel, adherent clot	2

The total score ranges from 0 to 11. Patients are classified as low risk (≤2), moderate risk (3–4), or high risk (≥5).[1] UGIB: Upper gastrointestinal bleeding

Table 2. Glasgow-Blatchford scoring system for the assessment of rebleeding and mortality risk in patients with UGIB

Glasgow-Blatchford Scores	Threshold	Score
Blood urea nitrogen (mmol/L)	6.5–7.9	2
	8.0–9.9	3
	10.0–24.9	4
	≥25.0	6
Hemoglobin for men (g/dL)	12.0–13.0	1
	10.0–11.9	3
	<10.0	6
Hemoglobin for women (g/dL)	10.0–12.0	1
	<10.0	6
Systolic blood pressure (mmHg)	100–109	1
	90–99	2
	<90	3
Heart rate (bpm)	>100	1
Melena	Present	1
Syncope	Present	2
Hepatic disease	Present	2
Cardiac failure	Present	2

The total score ranges from 0 to 23. Higher scores indicate increased risk and a greater need for clinical intervention.[2] UGIB: Upper gastrointestinal bleeding

Each component was assessed systematically, and the total Rockall score was recorded for each patient. According to the Rockall scoring system, patients were classified as low risk (0–2), moderate risk (3–4), or high risk (≥5).

GBS was calculated using clinical and laboratory variables obtained at presentation, including blood urea nitrogen, hemoglobin level, systolic blood pressure, and heart rate, as well as the presence of melena, syncope, hepatic disease, and cardiac failure. Urea values were converted to the corresponding blood urea nitrogen categories required for GBS calculation. Detailed components and score allocations of the Glasgow-Blatchford system are shown in Table 2.[2] All parameters were recorded at admission, and the total Glasgow-Blatchford score was determined for each patient.

The threshold for hypotension was defined as an arterial blood pressure below 90/60 mmHg, and tachycardia was defined as a heart rate greater than 100 beats per minute. Any death occurring within 30 days of admission—either during hospitalization or during the follow-up period after discharge—was recorded as a mortality event. Deaths were further categorized as UGIB-related or non-UGIB-related. Any recurrence of hematemesis, melena, or hematochezia during the one-month follow-up period was recorded as rebleeding.

Statistical Analysis

Statistical analyses were performed using SPSS software (IBM SPSS Statistics, version 25.0; IBM Corp., Armonk, NY, USA). Continuous variables were summarized as mean±SD (range), as appropriate, and categorical variables were presented as numbers and percentages. Correlations between clinical variables and study outcomes, including rebleeding and one-month mortality, were assessed using Spearman's correlation analysis. A p-value of <0.05 was considered statistically significant.

RESULTS

Study Group

A total of 1,030 patients were included in the study, of whom 719 (69.8%) were male and 311 (30.2%) were female. The mean age was 54.1 years (range: 12–90 years). Comorbidities were classified as cardiac, neoplastic, renal, cerebral, diabetes mellitus, respiratory, and hepatic diseases. The distribution of comorbidities was as follows: cardiac disease in 81 patients (7.9%), neoplastic disease in 24 (6.8%), renal disease in 22 (6.3%), cerebral disease in 21 (6.0%), diabetes mellitus in 20 (5.7%), respiratory disease in 19 (5.4%), and hepatic disease in 9 (2.6%).

Endoscopic evaluation was performed in all 1,030 patients. The mean time to endoscopy was 34.3 hours (range: 3–48 hours). Endoscopic findings were classified according to the Forrest classification. Accordingly, Forrest Ia lesions were observed in 32 patients (3.1%), Ib lesions in 150 (14.6%), IIa lesions in 14 (1.4%), IIb lesions in 100 (9.7%), IIc lesions in 30 (2.9%), and III lesions in 704 (68.3%). Lesions not included in the Forrest classification, such as Dieulafoy lesions and Mallory–Weiss tears, were recorded separately and were not included in the Forrest distribution. These lesions were identified in 1.9% and 0.9% of patients, respectively. The distribution of endoscopic findings is presented in Figure 1.

At admission, 891 patients (86.5%) were hemodynamically stable, whereas 58 (5.6%) were hypertensive, 54 (5.2%) were tachycardic, 16 (1.6%) were hypotensive, 8 (0.8%) were hypotensive and tachycardic, 2 (0.2%) were hypertensive and tachycardic, and 1 (0.1%) was bradycardic. The mean systolic blood pressure was 114.9 mmHg (range: 50–210), the mean diastolic blood pressure was 69.9 mmHg (range: 30–120), and the mean heart rate was 87 beats per minute (range: 55–140).

Laboratory parameters were as follows: hemoglobin, 9.3 g/dL (range: 3.01–16.3); hematocrit, 27.5% (range: 8.04–47.4);

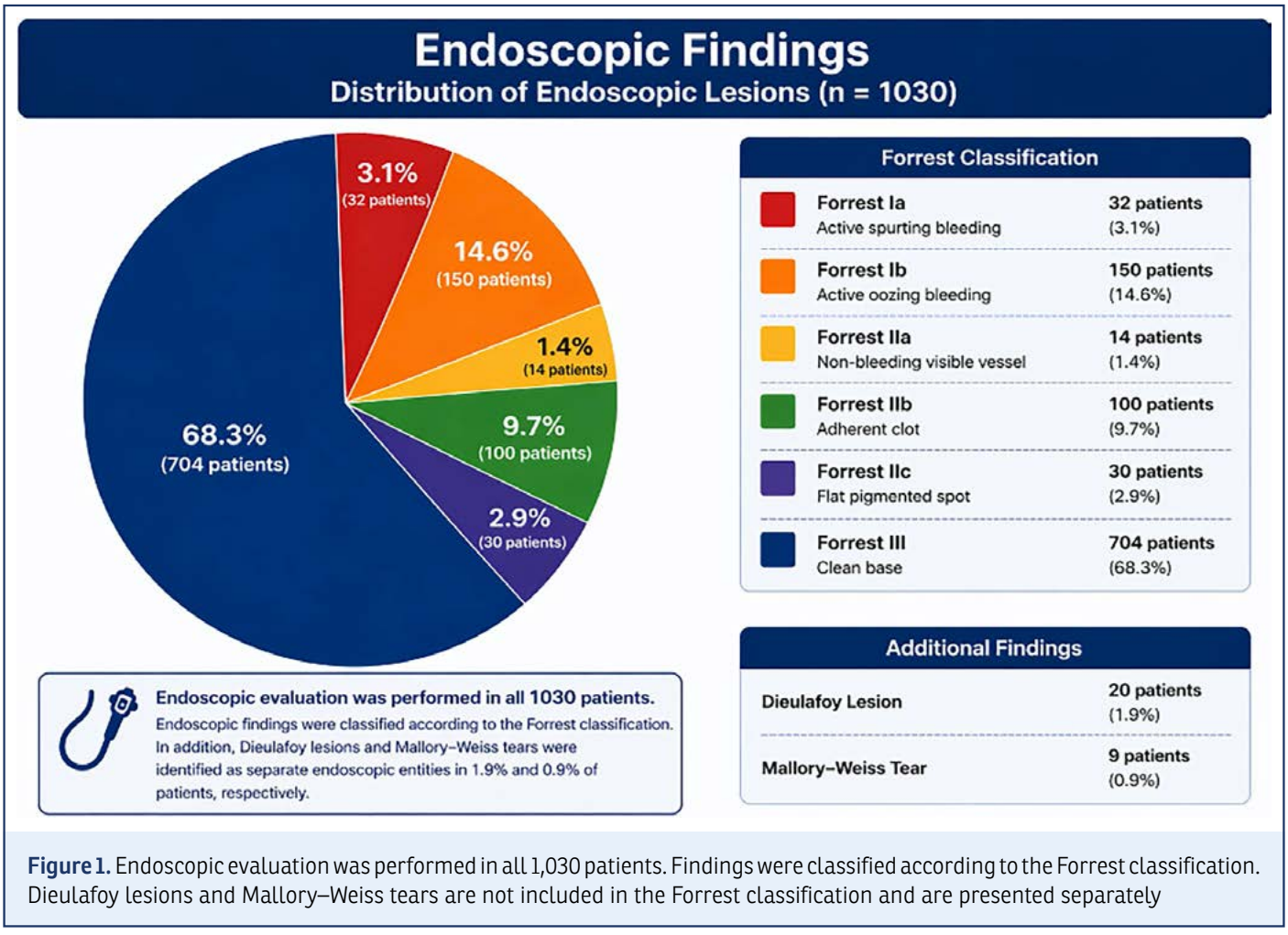

Figure 1. Endoscopic evaluation was performed in all 1,030 patients. Findings were classified according to the Forrest classification. Dieulafoy lesions and Mallory–Weiss tears are not included in the Forrest classification and are presented separately

and urea, 76.0 mg/dL (range: 8–633). The mean number of blood transfusions administered was 1.65 units (range: 1–12). Among the 1,030 patients, 21 (2.03%) required surgical intervention because of hemodynamic instability or failure to respond to endoscopic treatment.

Of the total cohort of 1,030 patients, follow-up data were available for 262. Among these, 232 patients (88.9%) did not experience rebleeding within the first month after discharge, whereas 30 patients (11.1%) developed recurrent bleeding during this period. During the one-month follow-up period, a total of 62 deaths were recorded. Of these, 36 deaths were directly attributable to UGIB, whereas 26 were due to non-UGIB-related causes. UGIB-related mortality occurred predominantly in the high-risk group according to the Rockall classification, with 35 of 36 deaths occurring in this group, whereas only one UGIB-related death occurred in the low-risk group and none occurred in the moderate-risk group. One-month mortality and rebleeding rates in the study cohort are presented in Figure 2.

The mean Rockall score was 2.45±1.99, whereas the mean Blatchford score was 7.15±4.49. Based on the Rockall scoring system, patients were stratified into low-, moderate-, and high-risk categories. The distribution of patients according to individual Rockall scores is presented in Figure 3, whereas the distribution across Rockall risk groups is shown in Figure 4. In addition, the distribution of patients according to Blatchford scores is shown in Figure 5, providing complementary information on clinical risk at presentation.

The relationships between UGIB-related mortality and various clinical, laboratory, and management-related variables were evaluated using Spearman's correlation analysis. A wide range of parameters, including demographic characteristics, hemodynamic findings at admission, laboratory values, endoscopic findings, treatment modalities, and risk scoring systems, were analyzed to determine their potential associations with mortality.

A positive correlation was observed between patient age and mortality ($r=0.332$, $p<0.05$). A significant association between

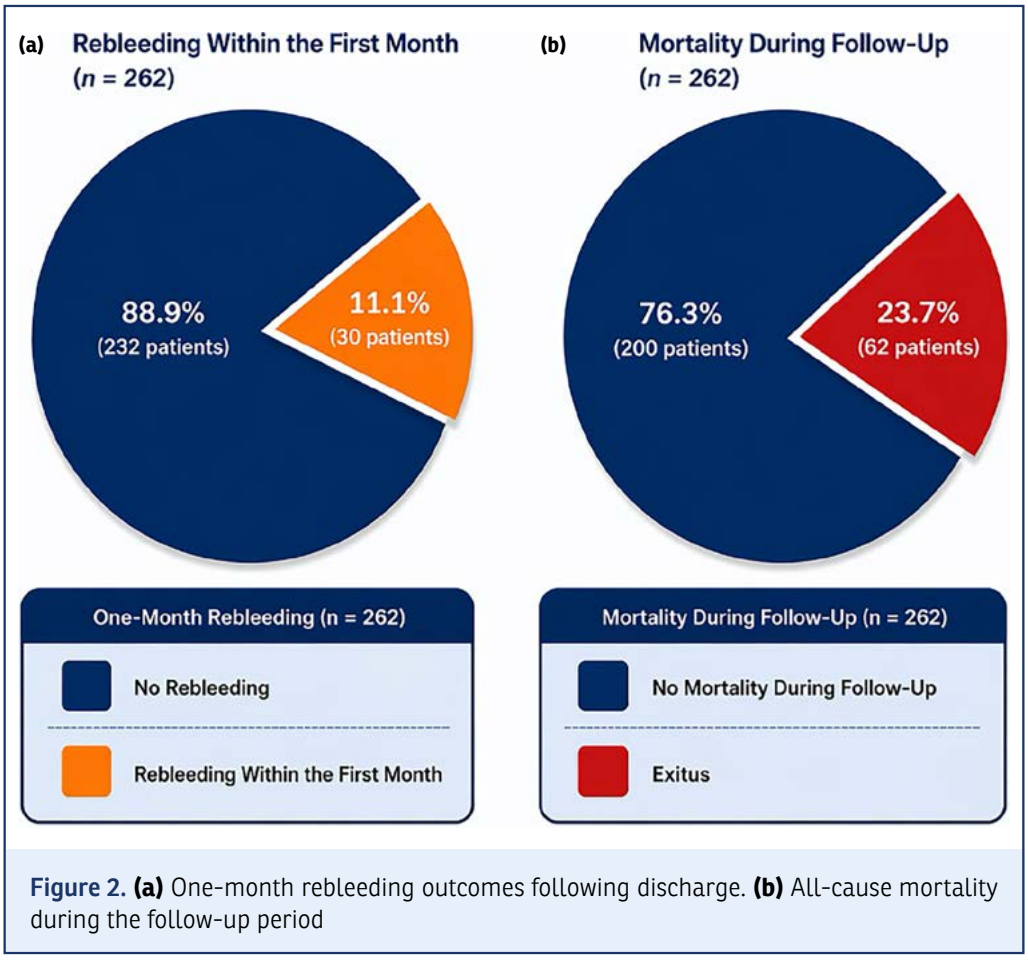

Figure 2. **(a)** One-month rebleeding outcomes following discharge. **(b)** All-cause mortality during the follow-up period

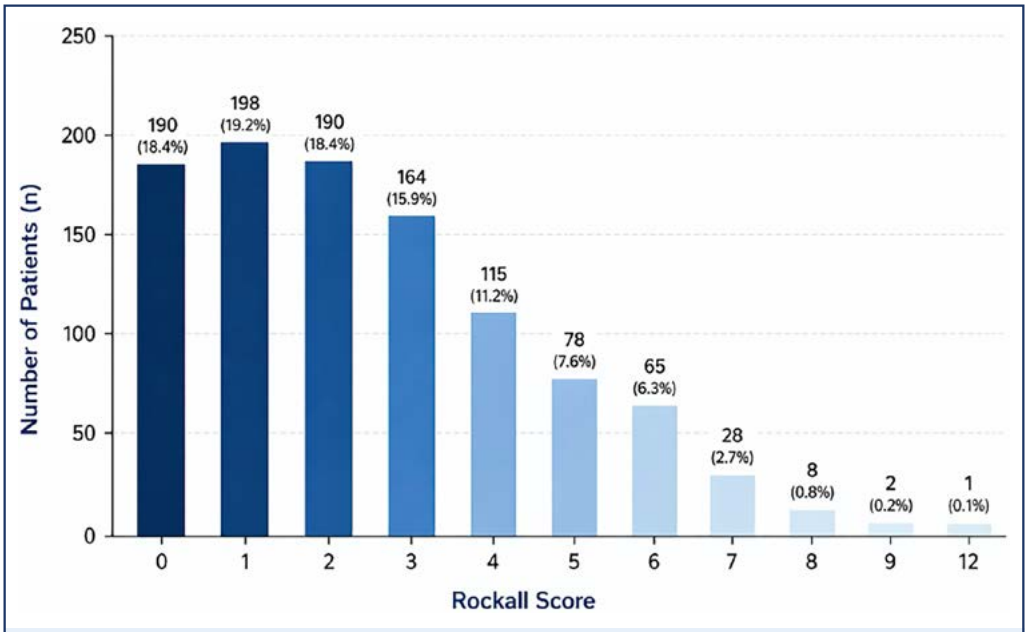

Figure 3. Distribution of patients according to Rockall score values in the study cohort (n=1,030)

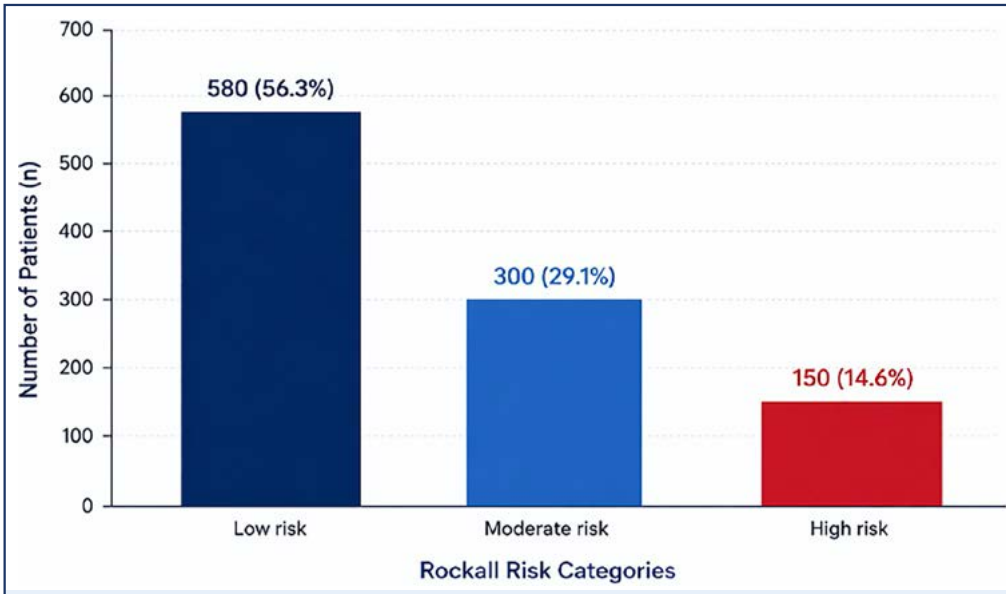

Figure 4. Distribution of patients according to Rockall risk categories (low, moderate, and high risk) in the study cohort (n=1,030)

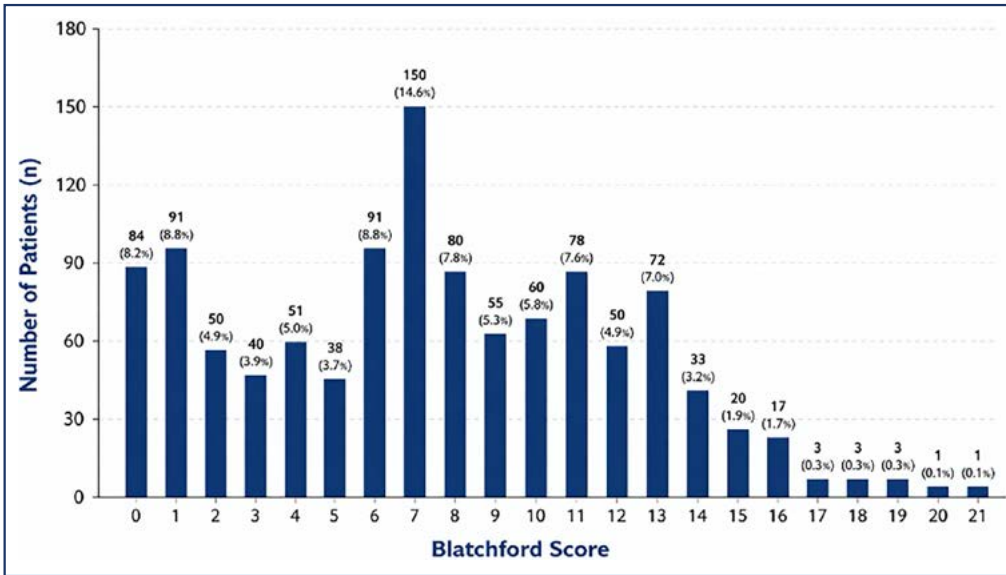

Figure 5. Distribution of patients according to Blatchford score values in the study cohort (n=1,030)

endoscopic findings and mortality was also identified; however, the strength of this correlation was weak (r=0.170, p<0.05).

Both systolic and diastolic blood pressure demonstrated weak inverse correlations with mortality (r=−0.147 and r=−0.152, respectively; p<0.05 for both). In contrast, hemodynamic stability showed a stronger inverse correlation (r=−0.346, p<0.05), indicating that hemodynamic stability was associated with a lower risk of mortality.

Hemoglobin and hematocrit levels were weakly and inversely associated with mortality (r=−0.179 and r=−0.159, respectively; p<0.05), whereas the urea level demonstrated a more pronounced positive correlation (r=0.286, p<0.05).

Both Rockall and Blatchford scores showed moderate correlations with mortality (p<0.05). Notably, these composite risk scoring systems—derived from several of the aforementioned clinical and laboratory parameters—demonstrated

Table 3. Spearman correlation analysis between clinical variables and mortality in patients with UGIB

Variable	Spearman's r	Direction	p
Age	0.332	Positive	<0.05
Endoscopic findings	0.170	Positive	<0.05
Systolic blood pressure	-0.147	Negative	<0.05
Diastolic blood pressure	-0.152	Negative	<0.05
Hemodynamic stability	-0.346	Negative	<0.05
Hemoglobin	-0.179	Negative	<0.05
Hematocrit	-0.159	Negative	<0.05
Urea	0.286	Positive	<0.05
Rockall score	0.507	Positive	<0.05
Blatchford score	0.425	Positive	<0.05
Sex	—	—	>0.05
Timing of endoscopy	—	—	>0.05
History of medication use	—	—	>0.05
Heart rate	—	—	>0.05
Blood transfusion	—	—	>0.05

Table 4. Spearman correlation analysis between clinical variables and rebleeding in patients with UGIB

Variable	Spearman's r	Direction	p
Age	—	—	>0.05
Endoscopic findings	0.288	Positive	<0.05
Systolic blood pressure	—	—	>0.05
Diastolic blood pressure	—	—	>0.05
Hemodynamic stability	—	—	>0.05
Hemoglobin	−0.126	Negative	<0.05
Hematocrit	—	—	>0.05
Urea	—	—	>0.05
Rockall score	0.259	Positive	<0.05
Blatchford score	0.247	Positive	<0.05
Sex	—	—	>0.05
Timing of endoscopy	—	—	>0.05
History of medication use	−0.197	Negative	<0.05
Heart rate	—	—	>0.05
Blood transfusion	—	—	>0.05

UGIB: Upper gastrointestinal bleeding

stronger associations than individual variables. Among all evaluated factors, the Rockall and Blatchford scores exhibited the strongest correlations with mortality, with the correlation being stronger for the Rockall score (r=0.507) than for the Blatchford score (r=0.425).

In contrast, no significant association was observed between mortality and sex, timing of endoscopy, history of medication use, heart rate, or blood transfusion (p>0.05). All correlation results are summarized in Table 3.

The relationships between rebleeding and various clinical variables were evaluated using Spearman's correlation analysis. The analysis demonstrated a significant association between endoscopic findings and the occurrence of rebleeding (r=0.288, p<0.05). A weak inverse correlation was observed between a history of medication use and rebleeding (r=−0.197, p<0.05), indicating a lower rate of rebleeding among patients receiving proton pump inhibitor therapy. Similarly, hemoglobin level demonstrated a weak inverse association with rebleeding (r=−0.126, p<0.05).

In contrast, no significant association was found between rebleeding and age, sex, timing of endoscopy, systolic or diastolic blood pressure, heart rate, hemodynamic stability, hematocrit level, urea level, or blood transfusion (p>0.05).

When evaluated using risk scoring systems, both Rockall and Blatchford scores showed weak but statistically significant correlations with rebleeding (r=0.259 and r=0.247, respectively; p<0.05). All correlation results are summarized in Table 4.

DISCUSSION

UGIB remains one of the most common and potentially life-threatening emergencies in surgical practice, carrying considerable morbidity and mortality despite advances in endoscopic and pharmacological management. Early and accurate risk stratification at the time of admission is therefore paramount, as it directly influences clinical decision-making, the timing of endoscopic intervention, and the appropriate allocation of hospital resources. Over the past decades, numerous scoring systems have been introduced to address this clinical need, among which the Rockall and GBS have gained the widest clinical acceptance and validation. In this study, we evaluated the clinical correlations of these two scoring systems alongside a broad range of individual clinical and laboratory variables in patients with confirmed non-variceal UGIB. Our findings demonstrate that both composite scoring systems showed statistically significant correlations with one-month mortality and rebleeding, with the Rockall score exhibiting a stronger association with mortality than the GBS.

In a multicenter study evaluating 2,977 patients across nine centers in China, Lu et al.[3] compared the clinical utility of the Rockall and GBS systems in patients with non-variceal UGIB. ROC analysis demonstrated that the Rockall score had superi-

or predictive value for mortality compared with the GBS (AUC: 0.804 vs. 0.622), whereas both scoring systems showed comparably limited performance in predicting rebleeding (AUC: 0.548 vs. 0.528). These findings were further corroborated by Custovic et al.,[4] who reported similar results in a single-center study of 237 patients conducted in Bosnia and Herzegovina, again demonstrating the superiority of the Rockall score in predicting mortality (AUC: 0.806 vs. 0.750). Notably, this study did not assess rebleeding as a separate endpoint. Furthermore, because the cohort included patients with variceal bleeding, the results should be interpreted with caution given the known differences in clinical course and scoring-system performance between variceal and non-variceal etiologies.

In contrast, Stanley et al.[5] reported comparable mortality prediction performance for both scoring systems in a multicenter prospective study of 1,555 patients across four UK centers, with no statistically significant difference between the full Rockall score and GBS (AUC: 0.790 vs. 0.804, p=0.20). Of particular note, this study was coauthored by Blatchford himself, lending considerable methodological authority to its conclusions. The mixed etiology of the cohort, which included both variceal and non-variceal bleeding, may have attenuated the observed differences between the two scoring systems. Importantly, however, this study highlighted a clinically meaningful distinction between the two scores: the GBS demonstrated markedly superior performance in predicting the need for blood transfusion (AUC: 0.932 vs. 0.752), underscoring the complementary rather than interchangeable nature of these two instruments—the Rockall score appearing better suited for mortality risk stratification, whereas the GBS offers greater utility in predicting the need for clinical intervention and blood transfusion, making it a more practical tool for early triage and resource allocation. Consistent with these findings, a meta-analysis by Kozai et al.[6] incorporating seven studies and 755 patients with non-variceal UGIB similarly demonstrated no statistically significant difference between the two scoring systems in predicting mortality (WMD=0.01, 95% CI: −0.06 to 0.08) or rebleeding (WMD=0.04, 95% CI: −0.03 to 0.11). However, the GBS was superior in predicting the need for blood transfusion (WMD=0.09, 95% CI: 0.01–0.16) and surgical intervention (WMD=0.21, 95% CI: 0.14–0.29).

In the present study, the Rockall score demonstrated a stronger correlation with one-month mortality than the GBS (r=0.507 vs. r=0.425). These discrepancies may reflect the underlying structural differences between the two systems: as noted by Custovic et al.,[4] mortality in UGIB largely reflects the burden of underlying comorbidities rather than the bleeding episode itself—parameters explicitly incorporated into the Rockall score but absent from the Glasgow-Blatchford score. The latter, which incorporates hemoglobin and hemodynamic variables, appears better suited to predicting the immediate clinical demands of the bleeding episode, including the need for transfusion and endoscopic or surgical intervention.

In a landmark international consensus statement developed in 2010 by a multidisciplinary panel of 34 experts from 15 countries—the International Consensus Upper Gastrointestinal Bleeding Conference Group—Barkun et al.[7] emphasized that composite prognostic scoring systems are recommended over individual clinical parameters for the early stratification of patients with non-variceal UGIB into low- and high-risk categories for rebleeding and mortality. The consensus explicitly recognized that although individual clinical variables carry prognostic significance, their integration into validated composite scoring systems substantially enhances predictive accuracy. Consistent with the findings of the present study, the panel further noted that the Rockall score demonstrates superior discriminative ability for mortality, whereas the GBS is better suited for identifying patients requiring urgent clinical intervention. In the 2019 update of the same consensus, the group declined to make a formal recommendation for or against the pre-endoscopic Rockall score, explicitly acknowledging the superiority of the complete Rockall score over its pre-endoscopic counterpart—a position that directly reinforces the added prognostic value of incorporating endoscopic parameters into risk assessment. Early endoscopy within 24 hours was unanimously endorsed.[8] Taken together, these evolving guideline recommendations reflect a broader trend in the literature toward a functional differentiation between the two scoring systems: the GBS is increasingly recognized as the preferred instrument for pre-endoscopic triage and safe early discharge decisions, whereas the Rockall score—by virtue of its inclusion of endoscopic findings, age, and comorbidity—is better positioned for comprehensive mortality risk stratification once endoscopic assessment has been completed. In a prospective international multicenter study by Stanley et al.,[9] five composite scoring systems—the Glasgow-Blatchford score, admission Rockall score, full Rockall score, AIMS65, and PNED score—were evaluated across 3,012 patients with UGIB. All composite systems demonstrated substantially greater predictive accuracy than individual clinical parameters, reinforcing the value of structured multivariable risk assessment. Additionally, the Glasgow-Blatchford score showed the highest discriminative ability for predicting the need for endoscopic treatment (AUROC=0.75), yet yielded the lowest predictive accuracy for 30-day mortality (AUROC=0.64), for which the AIMS65 and PNED scores performed best (AUROC=0.77 each). Because this co-

hort included both variceal and non-variceal etiologies without separate subgroup analysis, the results should be interpreted with caution specifically in the non-variceal setting. In the present study, both scoring systems demonstrated stronger associations than individual clinical and laboratory variables in predicting mortality and rebleeding, a finding consistent with the evidence outlined above and supportive of composite risk assessment over single-parameter clinical judgment.

Among the individual clinical and laboratory variables assessed in the present study, hemodynamic stability at admission demonstrated the strongest correlation with one-month mortality (r=-0.346), outperforming all other individual parameters, including age, serum urea, and hemoglobin. This finding is consistent with a 2023 systematic review and meta-analysis by Tari et al.,[10] comprising 39 cohort studies, in which hemodynamic instability at admission was identified as a strong independent predictor of adverse outcomes in acute GIB. Pooled analysis demonstrated that hemodynamically compromised patients had a 5.48-fold increased risk of in-hospital mortality (OR: 5.48; 95% CI: 3.99–7.52) and a 3.99-fold increased risk of 30-day mortality (OR: 3.99; 95% CI: 3.08–5.17), along with markedly higher rates of rebleeding and surgical intervention. Age demonstrated the second strongest correlation with one-month mortality among individual clinical parameters in the present study (r=0.332). In a prospective multicenter study by Hwang et al.[11] comprising 1,584 patients with non-variceal UGIB, multivariate analysis revealed that age >65 years independently contributed to 30-day mortality risk (OR: 2.627; 95% CI: 1.298–5.318), a finding consistent with the diminished physiological reserve and increasing comorbidity burden characteristic of older adults. Marmo et al.[12] further corroborated this finding in a prospective multicenter study of 2,317 patients, demonstrating that 85% of deaths were associated with one or more major comorbid conditions, with severe comorbidity emerging as the second strongest independent predictor of mortality after hemodynamic instability (OR: 6.72; 95% CI: 1.87–24.0).

The present study has several notable strengths. As a tertiary referral center for endoscopic intervention, the study hospital received patients from a wide catchment area, enhancing the clinical diversity and representativeness of the cohort. The strict exclusion of variceal bleeding ensured a homogeneous study population, thereby enhancing the internal validity of the findings and their specific applicability to the non-variceal setting.

The findings of this study should be interpreted in light of several notable limitations. First, this was a single-center study, which may limit the generalizability of the findings to other clinical settings and patient populations. Second, the study was conducted between 2001 and 2005, a period preceding the widespread adoption of modern endoscopic hemostatic techniques and standardized high-dose proton pump inhibitor protocols; outcomes in contemporary practice may therefore differ. Third, follow-up data on rebleeding were available only for a subset of patients because a considerable proportion of the cohort could not be reached for follow-up, limiting the statistical power of the rebleeding analyses and introducing potential selection bias. Finally, the use of Spearman correlation as the primary statistical method, although appropriate for the study objectives, does not allow identification of independent predictors after adjustment for confounding variables, thereby limiting causal inference.

CONCLUSION

In conclusion, both the Rockall and Glasgow-Blatchford scoring systems demonstrated statistically significant correlations with one-month mortality and rebleeding in non-variceal UGIB, with the Rockall score showing a stronger association with mortality. Both systems showed stronger correlations than individual clinical parameters, supporting the use of composite risk assessment in clinical practice. Among individual variables, hemodynamic stability and advanced age emerged as the strongest correlates of mortality, reinforcing the importance of early clinical assessment at the time of admission.

Disclosures

Ethics Committee Approval: The study was approved by the Istanbul University of Health Sciences Kanuni Sultan Suleyman Training and Research Hospital Scientific Research Ethics Committee (No: 3, Date: 08/01/2025).

Informed Consent: Due to the retrospective nature of the study, the requirement for written informed consent was waived by the institutional ethics committee.

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

Funding: The authors declared that this study received no financial support.

Use of AI for Writing Assistance: No use of AI-assisted technologies was declared by the authors.

Author Contributions: Concept – N.B.D.Ö., M.O.A.; Design – N.B.D.Ö., H.A.; Supervision – H.A.; Data collection and/or processing – N.B.D.Ö.; Data analysis and/or interpretation – C.Ö.; Literature search – M.O.A.; Writing – N.B.D.Ö., M.O.A.; Critical review – N.B.D.Ö., H.A.

Peer-review: Externally peer-reviewed.

REFERENCES

1. Rockall TA, Logan RF, Devlin HB, Northfield TC. Risk assessment after acute upper gastrointestinal haemorrhage. Gut 1996;38:316–21. [CrossRef]
2. Blatchford O, Murray WR, Blatchford M. A risk score to predict need for treatment for upper-gastrointestinal haemorrhage. Lancet 2000;356:1318–21. [CrossRef]
3. Lu M, Sun G, Huang H, Zhang X, Xu Y, Chen S, et al. Comparison of the Glasgow-Blatchford and Rockall Scores for prediction of nonvariceal upper gastrointestinal bleeding outcomes in Chinese patients. Medicine (Baltimore) 2019;98:e15716. [CrossRef]
4. Custovic N, Husic-Selimovic A, Srsen N, Prohic D. Comparison of Glasgow-Blatchford Score and Rockall Score in Patients with Upper Gastrointestinal Bleeding. Med Arch 2020;74:270–4. [CrossRef]
5. Stanley AJ, Dalton HR, Blatchford O, Ashley D, Mowat C, Cahill A, et al. Multicentre comparison of the Glasgow Blatchford and Rockall Scores in the prediction of clinical end-points after upper gastrointestinal haemorrhage. Aliment Pharmacol Ther 2011;34:470–5. [CrossRef]
6. Kozai L, Tan A, Nebrejas K, Nishimura Y. Comparative diagnostic utility of Rockall and Glasgow-Blatchford scores in non-variceal upper gastrointestinal bleeding: a systematic review and meta-analysis. Eur J Gastroenterol Hepatol 2025;37:161–6. [CrossRef]
7. Barkun AN, Bardou M, Kuipers EJ, Sung J, Hunt RH, Martel M, et al.; International Consensus Upper Gastrointestinal Bleeding Conference Group. International consensus recommendations on the management of patients with nonvariceal upper gastrointestinal bleeding. Ann Intern Med 2010;152:101–13. [CrossRef]
8. Barkun AN, Almadi M, Kuipers EJ, Laine L, Sung J, Tse F, et al. Management of Nonvariceal Upper Gastrointestinal Bleeding: Guideline Recommendations From the International Consensus Group. Ann Intern Med 2019;171:805–22. [CrossRef]
9. Stanley AJ, Laine L, Dalton HR, Ngu JH, Schultz M, Abazi R, et al.; International Gastrointestinal Bleeding Consortium. Comparison of risk scoring systems for patients presenting with upper gastrointestinal bleeding: international multicentre prospective study. BMJ 2017;356:i6432. [CrossRef]
10. Tari E, Frim L, Stolcz T, Teutsch B, Veres DS, Hegyi P, et al. At admission hemodynamic instability is associated with increased mortality and rebleeding rate in acute gastrointestinal bleeding: a systematic review and meta-analysis. Ther Adv Gastroenterol 2023;16:17562848231190970. [CrossRef]
11. Hwang S, Jeon SW, Kwon JG, Lee DW, Ha CY, Cho KB, et al.; Daegu-Gyengbuk Gastrointestinal Study Group (DGSG). The Novel Scoring System for 30-Day Mortality in Patients with Non-variceal Upper Gastrointestinal Bleeding. Dig Dis Sci 2016;61:2002–10. [CrossRef]
12. Marmo R, Koch M, Cipolletta L, Bianco MA, Grossi E, Rotondano G; PNED 1 and PNED 2 Investigators. Predicting mortality in patients with in-hospital nonvariceal upper GI bleeding: a prospective, multicenter database study. Gastrointest Endosc 2014;79:741–9.e1. [CrossRef]