



# Evaluation of Glaskow-Blatchford, Rockall Scores and Shock Index of Patients Admitted from the Emergency Department with A Diagnosis of Upper Gastrointestinal System Bleeding

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## Abstract

**Background:** Risk scores and shock index used in upper gastrointestinal system (GSB) bleeding have an important place in determining the treatment and clinical course of the patient. The aim of this study is to evaluate the predicted success in mortality by analyzing shock indices together with Glasgow Blatchford Scoring (GBS) and Rockall Scoring (RS), which are used in upper GI bleeding.

**Methods:** This study was conducted with a retrospective analysis of patients who were hospitalized with a diagnosis of upper GI bleeding from the emergency department of a single-center secondary care health institution. For each patient, age, gender, treatment procedures performed in the emergency department or clinic, and endoscopy results were evaluated. Mortality and discharge status of the patients were compared with the scoring values.

**Result:** 86 patients were evaluated in the study. The average age was 69.09±19.07 and the most applications were in the 61-79 age range (48.8%). The most common presenting complaints of the patients were bloody vomiting and black stools. On physical examination, melena was positive in 64% of the patients. 89.5% of the patients were treated in intensive care. The mortality rate was 10.5%. In patients with death, the shock index value was  $\geq 0.75$  in all patients and the average was 1.07. As a result of the study, it was seen that GBS, RS and shock index were successful in predicting mortality.

**Conclusion:** Current scoring systems need to be developed in order to manage patients with upper GI bleeding, which is frequently seen in emergency departments today, more quickly and to reduce patient costs. **Keywords:** Glasgow Coma Scale, Head Trauma, Acute Brain Injuries, FOUR score.

**Keywords:** Glaskow Blatchford Score, Rockall Score, Shock Index, Upper Gastrointestinal Tract Bleeding

## Introduction

Anatomically, bleeding occurring between the upper part of the esophagus and the ligament of Treitz constitutes upper gastrointestinal (GI) tract bleeding. These bleedings account for approximately 90% of all GI bleedings and have an important place in emergency department admissions.<sup>1,2</sup>

The most common causes of upper GI bleeding in our country and worldwide have been reported as peptic ulcer, gastritis, gastroesophageal variceal bleeding, esophagitis, malignancy and Mallory-Weiss syndromes.<sup>3,4</sup> Acetylsalicylic acid (ASA), antiaggregant drugs, oral anticoagulants (OAC), non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroid use are the most common causes of bleeding.<sup>5</sup>

With the aim of reducing the burden of patient admissions due to upper GI bleeding in the emergency department and decreasing patient costs, many risk scoring methods have been developed to predict rebleeding and mortality in patients by analyzing clinical findings, laboratory findings, comorbid conditions and endoscopy findings. The two most widely used scoring systems world wide are the Glasgow-

Blatchford Scoring (GBS) system, which identifies low-risk patients with clinical findings and laboratory data and the Rockall Score (RS) system, which aims to predict mortality with the addition of endoscopy findings.<sup>6,7</sup> Shock index also has an important place in clinical follow-up in addition to scoring. The normal range of the shock index is 0.5-0.7 and it is an effective guide in determining early hemorrhagic shock in patients with GI bleeding. It is more useful in following the changes in the clinical follow-up of the disease instantaneously.<sup>8,9</sup> The shock index is obtained by the ratio of the patient's heart beat per minute to systolic blood pressure.<sup>10</sup>

In this study, we aimed to perform a large-scale analysis of patients with upper GI bleeding who were hospitalized from the emergency department within a one-year period and to evaluate the prediction of GBS, Pre-RS (before endoscopy) and RS systems and shock index on mortality in patients. Although there are similar studies on the subject in the literature, we found that the studies were generally focused on epidemiology, single scoring system and endoscopy results. In this study, we wanted to conduct a comprehensive study by analyzing many data at the same

time. The limitation of the study was the lack of a specialist of the relevant branch in the center where the study was conducted in the previous years and the fact that endoscopy was not performed regularly, which led to a small number of patients included in the study.

## Materials and Methods

This study was conducted as a single-center retrospective analysis of patients hospitalized with upper GI bleeding from the emergency department of a state hospital serving as a secondary care. The ethics committee approval of \*\*\* University Rectorate Non-Interventional Clinical Research Publication Ethics Committee numbered 2023/01 and dated 16/10/2023 was obtained for the study and the rules of the Declaration of Helsinki were followed.

The date range of the study was determined as 01.01.2022-31.12.2022. Data collection was performed electronically through the 'SISOFT' hospital software system. For each patient, age, gender, time of admission, presenting complaint, vital signs, laboratory data, comorbidities, medication use, treatment procedures performed in the emergency department or in the hospitalized clinic, blood product replacement, length of hospitalization, and endoscopy results were evaluated. GBS, RS values before and after endoscopy were analyzed with the data obtained. In hospital mortality and discharge status of the patients were compared with the scoring values. In the study period, 97 patients were hospitalized due to upper GI bleeding. However, 11 patients were excluded from the study due to missing data in the data system and archival records.

Statistical Package for Social Sciences for Windows 21.0 (SPSS 21.0) program was used to analyze the data. Descriptive statistics and frequency analysis (frequency, percentage distribution) were used to analyze the data. Results were expressed as mean  $\pm$  SD or frequency (percentage). ROC analysis was used to investigate the predictive value of GBS, Pre-RS, RS and shock index for survival. Areas under the ROC curve were calculated with 95% confidence intervals.

## Results

In this study, 86 patients were included and the distribution of male and female patients was equal (50%). The mean age of the patients was  $69.09 \pm 19.07$  (22-102) years. According to the time of admission, the highest number of admissions was between 08.00-15.59 hours (38.4%) (n=33), followed by 16.00-23.59 hours (37.2%) (n=32) and finally 24.00-07.59 (n=21) hours (21%). In terms of months, the lowest number of visits was in February (1.2%) (n=1) and the highest number of visits was in October (15.1%) (n=13).

The most common reasons for presentation to the emergency department were bloody vomiting (54.7%)

(n=47) and black stools (31.4%) (n=27). The most common physical examination finding was positive melena (64%) (n=55) (Table 1). The mean vital values and laboratory values of the patients at admission and are given in table 1.

When the comorbidities seen in the patients were evaluated, hypertension (53.5%) (n=46) and coronary artery disease (39.5%) (n=34) were the most common. Regarding drug use, ASA (25.6%) (n=22), NSAIDs (14.3%) (n=18) and apixaban (7.1%) (n=9) were the most common drugs used in patients with bleeding, respectively (Table 1).

When the treatments given to the patients were analyzed, it was observed that all of the patients were administered 80 mg intravenous injection and intravenous infusion proton pump inhibitor (PPI) treatment at a rate of 8 mg/h as maintenance treatment in the emergency department. The total number of patients who received blood product replacement in the emergency department or in the hospitalization clinic was 49. Five of these patients received erythrocyte suspension (ES) replacement and fresh frozen plasma together, while 44 patients received only ES replacement. Erythrocyte replacement was performed with a hemoglobin level of  $<7$  g/dL in patients with stable vital signs and no comorbidities, a hemoglobin level of  $<9$  g/dL in patients with advanced age and comorbid factors, and a hemoglobin level of  $>10$  and hematocrit level of  $>25$ .

89.5% (n=77) of hospitalizations were made to intensive care unit. The mean length of hospitalization was 6.74 days (1-60).

The number of patients who underwent endoscopy was 79. When the endoscopy reports of these patients were analyzed, it was seen that erosive gastritis (40.7%) (n=35) and gastroduodenal ulcer (31.4%) (n=27) were most common (Table 1). Active bleeding was observed in 3 patients during endoscopy.

Risk scoring and mean shock index values of the patients are given in table 1. Detailed analysis of 9 patients who died in the hospital is given in table 2. Endoscopic examination was not performed in 3 of these patients due to lack of hemodynamic stability and infections and other comorbidities that developed in the intensive care unit.

Of the patients who died, 66.6% (n=57) were female and 77.7% (n=66) were aged  $\geq 80$  years. Laboratory data revealed that 66.6% of the patients who died had a hemoglobin value  $\leq 10$  g/dL at the time of presentation to the emergency department. On the other hand, the blood urea value was  $\geq 25$  mg/dL in all of these patients. In our study, the in-hospital mortality rate was 10.5% and when the mortality prediction of risk scores was analyzed by ROC analysis, the area under the curve was calculated as 0.56 (0.32-0.80; 95% CI) for GBS, 0.81 (0.64-0.97; 95% CI) for Pre-RS, 0.85 (0.68-1.00; 95% CI) for RS and 0.73 (0.59-0.88; 95% CI) for shock index (Figure 1). According to these results, RS was the most successful scoring system in predicting mortality.

**Table 1:** General analysis of the data obtained in the study

<b>Demographic Data</b>	<b>Number (n) / Ratio (%) / Mean <math>\pm</math>SD</b>		
<b>Gender</b>	<b>All Patients</b>	<b>Discharged Patients</b>	<b>Deceased Patients</b>
Female	43 (50)	37 (48.1)	6 (66.3)
Male	43 (50)	40 (51.9)	3 (33.3)
<b>Age Average</b>	<b>69.09<math>\pm</math>19.07</b>	<b>67.20<math>\pm</math>17.83</b>	<b>85.22<math>\pm</math>11.14</b>
<b>Complaint</b>			
Bloody vomiting	47 (54.7)	40 (51.9)	7 (77.8)
Black stools	27 (31.4)	25 (32.5)	2 (22.2)
Fatigue	7 (8.1)	7 (9.1)	0 (0)
Fainting / Syncope	4 (4.7)	4 (5.2)	0 (0)
Dizziness	1 (1.2)	1(1.3)	0 (0)
<b>Physical Examination Finding</b>			
Melena positive	55 (64)	49 (64.9)	6 (66.3)
Signs of shock (Pallor.,sweating., shortness of breath. etc.)	9 (10.5)	9 (11.7)	0 (0)
Bloody Vomiting / Blood in the nasogastric catheter	7 (8.1)	4 (5.1)	3 (33.3)
No findings	15 (17.4)	15 (18.3)	0 (0)
<b>Systolic Blood Pressure (mm/Hg)</b>	<b>108.37<math>\pm</math>18.01</b>	<b>109.87<math>\pm</math>17.88</b>	<b>95.55<math>\pm</math>14.24</b>
<b>Diastolic Blood Pressure (mm/Hg)</b>	<b>70.93<math>\pm</math>12.04</b>	<b>71.81<math>\pm</math>11.77</b>	<b>63.33<math>\pm</math>12.24</b>
<b>Pulse rate (/minute)</b>	<b>94.18<math>\pm</math>13.29</b>	<b>93.50<math>\pm</math>13.21</b>	<b>100<math>\pm</math>13.22</b>
<b>Laboratory Results</b>			
White Blood Cell (10 <sup>3</sup> U/L)	10.20 $\pm$ 3.95	10.22 $\pm$ 4.03	15.29 $\pm$ 10.01
Hemoglobin (g/dL)	10.04 $\pm$ 2.83	10.16 $\pm$ 2.79	9.05 $\pm$ 3.18
Trombosit (10 <sup>3</sup> U/L)	262.39 $\pm$ 131.41	262.07 $\pm$ 127.78	265.10 $\pm$ 168.36
INR*	1.60 $\pm$ 1.28	1.63 $\pm$ 1.35	1.43 $\pm$ 0.31
Ürea(mg/dL)	85.27 $\pm$ 51.51	82.46 $\pm$ 43.30	109.33 $\pm$ 98.24
Creatinine ( mg/dL)	1.35 $\pm$ 1.15		1.42 $\pm$ 0.68
<b>Comorbidity Diseases</b>			
Hypertension	46 (53.5)	42 (54.5)	4 (44)
Coronary Artery Disease	34 (39.5)	27 (35.1)	7 (77.8)
Diabetes Mellitus	24 (27.9)	24 (31.2)	0 (0)
Chronic Renal Failure	9 (10.5)	8 (10.4)	1 (11.1)
Malignancy	8 (9.3)	7 (9.1)	1 (11.1)
Heart failure	8 (9.3)	6 (7.8)	2 (22.2)
Liver failure	5 (5.8)	5 (6.5)	0 (0)
<b>Medication Use</b>			
No use	21 (24.4)	21 (27.3)	0 (0)
Acetyl Salicylic Acid	22 (25.6)	19 (24.7)	3 (33.3)
Non Steroidal Anti-inflammatory Drug	18 (14.3)	16 (19.5)	2 (22.2)
Apixaban	9 (7.1)	7 (9.1)	2 (22.2)
Warfarin Sodium	8 (9.3)	8 (10.4)	0 (0)
Clopidogrel	8 (9.3)	6 (9)	2 (22.2)
Rivaroxaban	4 (4.6)	3 (3.9)	1 (11.1)
Dabigatran	2 (2.3)	2 (1.3)	0 (0)
Corticosteroid	2 (2.3)	0 (0)	2 (22.2)
<b>Patients Given Blood Products</b>			
Erythrocyte Suspension	44 (51.2)	38 (49.4)	6 (66.6)
Fresh Frozen Plasma	5 (5.8)	5 (6.5)	0 (0)
<b>Hospitalization</b>			
Intensive Care Unit	77 (89.5)	68 (88.3)	9 (100)
Service	9 (10.5)	9 (11.7)	0 (0)
Average length of stay (days)	6.74 $\pm$ 7.71	6.44 $\pm$ 6.89	9.33 $\pm$ 13.15
<b>Endoscopy Result**</b>			
Erosive Gastritis	35 (40.7)	33 (42.9)	2 (22.2)
Gastroduodenal Ulcer	27 (31.4)	25 (32.4)	2 (22.2)
Esophageal Varicose Veins	7 (8.1)	6 (77.9)	1 (11.1)
Malignancy	6 (7)	5 (6.4)	1 (11.1)
Esophagitis	3 (3.5)	3 (3.9)	0 (0)
Normal	1 (1.2)	1 (1.3)	0 (0)
Patient without endoscopy	7 (8.1)	4 (5.2)	3 (33.3)
<b>Scoring</b>			
Glasgow Blatchford Score	10.88 $\pm$ 4.36	10.71 $\pm$ 4.15	12.33 $\pm$ 5.97
Pre-Endoscopic Rockall Score	3.38 $\pm$ 2.44	3.07 $\pm$ 2.25	6 $\pm$ 2.54
Rockall Score	4.36 $\pm$ 2.46	4.01 $\pm$ 2.25	7.33 $\pm$ 2.91
Shock Index	0.90 $\pm$ 0.27	0.88 $\pm$ 0.27	1.07 $\pm$ 0.24
Mortality	9 (10.5)	0 (0)	100 (100)

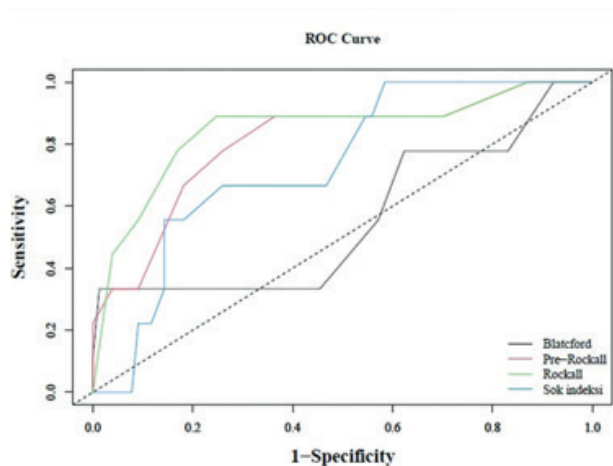
\*SD: Standard Deviation. INR: International normalized ratio, \*\*Endoscopy evaluation predominantly focuses on the lesion seen.

**Table 2:** Detailed evaluation of the data of deceased patients

Patients/Data	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7	Patient 8	Patient 9
Gender	Female	Male	Female	Female	Male	Female	Male	Female	Female
Age	80	66	87	102	71	90	91	92	88
Complaint	Bloody Vomiting	Bloody Vomiting	Bloody Vomiting	Bloody Vomiting	Bloody Vomiting	Bloody Vomiting	Bloody Vomiting	Black stools	Black stools
Physical Examination Finding	Melena	Melena	Melena	Bloody Vomiting	Melena	Melena	Melena	Bloody Vomiting	Bloody Vomiting
Systolic Blood Pressure (mm/Hg)	100	120	80	100	80	90	80	100	110
Diastolic Blood Pressure (mm/Hg)	70	70	50	80	50	50	60	60	80
Pulse rate (/minute)	120	90	110	80	90	110	110	100	90
Laboratory Results**									
White Blood Cell (10 <sup>3</sup> U/L)	12.5	6.59	12	11.1	4.66	15.3	7.38	11.5	9.1
Hemoglobin (g/dL)	10.9	13.8	4.2	8.9	8.7	4.1	9.7	9.7	11.5
Trombosit (10 <sup>3</sup> U/L)	214	260	14.9	337	195	329	146	630	260
INR*	1.02	1.39	1.6	1	1.2	1.81	1.6	1.37	1.88
Ürea(mg/dL)	308	48	234	45	41	119	107	31	51
Creatinine ( mg/dL)	2.54	0.92	2.4	0.93	1.58	1.3	1.64	1.01	1.04
Comorbidity Diseases*	CAD, CRF	No	HT,CAD	HT,CAD	Malignity	HT,CAD, CHF	CAD,CHF	CAD	HT,CAD
Medication Use*	NSAID Klopidoğrel	NSAID Kortikosteroid	ASA	ASA	Cortikosteroid	Apixaban	ASA	Apixaban	Rivaroksaban
Patients Given Blood Products									
Erythrocyte Suspension	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Fresh Frozen Plasma	No	No	No	No	No	No	No	No	No
Endoscopy Result	Erosiv Gastrit	Erosiv Gastrit	Duodenal Ulcer	Malignity	Not available	Not available	Not available	Esophageal Varices	Peptic Ulcer
Hospitalization*	ICU	ICU	ICU	ICU	ICU	ICU	ICU	ICU	ICU
Length of hospitalization (day)	5	4	5	43	1	6	4	2	14
Scoring									
GlasgowBlatchford Score	10	5	19	11	10	19	21	11	5
Pre-Endoscopic Rockall Score	8	1	6	6	6	9	9	5	4
Rockall Score	9	2	9	7	6	9	9	8	7
Shock Index	1.2	0.75	1.37	0.8	1.12	1.22	1.37	1	0.81

\*CAD: Coronary Artery Diseases, CRF: Chronic Renal Failure, HT: Hypertension, CHF: Chronic Heart Failure, NSAID: Non-Steroid Anti-Enflamatuar Drug, ASA: Asetil Salisilik Asit, ICU: Intensive Care Unit

\*\*Laboratory results evaluated in the first examination in the emergency department



**Figure 1:** ROC analysis curves of the accuracy of the Glaskow Blatchford score, Pre-endoscopic Rockall score, Rockall score, and shock index in predicting mortality

## Discussion

In our study, we analyzed the data of 86 patients hospitalized with upper GI bleeding over a one-year period. We analyzed the prediction of mortality by risk scores and shock index in patients with upper GI bleeding and found that RS was the most successful scoring system.

In the literature, comparisons have been made with GBS, RS and shock index in determining mortality and clinical prognosis. Accordingly, Rassameehiran et al. stated that the shock index was the best indicator of the need for transfusion and endoscopic treatment among the scoring tools.<sup>8</sup> In the study by Gökcek et al. shock index was found to be less successful than GBS and RS in identifying high-risk patients, although it was found to be significant in the need for transfusion.<sup>11</sup> In another study comparing the shock index with the GBS and RS, the GBS was found to be the most successful scoring system in predicting the need for major transfusion and the need for endoscopic treatment.<sup>9</sup> Saffuri and Gökcek found the shock index to be less successful in predicting mortality than GBS and RS in similar studies.<sup>11,12</sup> In contrast to these studies, Dogru et al. reported that shock index was statistically more successful than GBS and RS in predicting 30-day mortality.<sup>9</sup> Budimir et al. emphasized that scoring systems alone do not give good results and that more accurate results would be obtained with more than one scoring system.<sup>13</sup>

Advanced age, shock status, presence of comorbidities, low hemoglobin level at admission, need for transfusion, presence of fresh blood on rectal touch or gastric lavage and hematemesis are the most important markers in predicting mortality in patients with upper GI bleeding.<sup>14</sup>

We found that the patients were equally distributed in male and female gender. Similar studies in the literature have shown that upper GI bleeding is more common in the male gender.<sup>5,9,11-15</sup> The mean age of the patients was  $69.09 \pm 19.07$

years. The mean ages were reported to be  $61.12 \pm 17.14$  in the study by Yalcin et al.,<sup>4</sup> and  $63.7 \pm 15.7$  in the study by Gökcek et al.<sup>11</sup> In our study, we observed that patients most frequently presented to the emergency department with bloody vomiting (54.7%) and black stools (31.4%). Okutur et al. found that 17% of the patients presented with hematemesis, 37.8% with hematemesis and melena, and 45.2% with melena.<sup>16</sup> In the study by Yenigün et al. 37.9% of the patients presented with only melena, 8.7% with only hematemesis, and the remaining 53.3% with hematemesis and melena.<sup>17</sup> In one study, it was reported that 12% of patients presented with syncope and fainting.<sup>11</sup> In our study, the rate of patients presenting with syncope and fainting was 4.7%. In another study, the rate of patients presenting with dizziness was 2%.<sup>18</sup> In general, hematemesis and melena are recognized earlier because they are visible findings. Findings such as dizziness and weakness may not initially suggest that the patient may have GI bleeding. Therefore, we would like to emphasize that the possibility of GI bleeding should definitely be considered at the diagnostic stage in such patients.

Laboratory data at the time of admission are instructive in determining the clinical course and mortality in patients with upper GI bleeding. In our study, the mean hemoglobin was  $10.04 \pm 2.83$  g/dL, blood urea was  $85.27 \pm 51.51$  mg/dL and creatinine was  $1.35 \pm 1.15$  mg/dL. In a similar study, the mean hemoglobin was  $9.15 \pm 2.65$  g/dL, and blood urea was  $89.27 \pm 60.14$  mg/dL.<sup>11</sup> In our study, the rate of patients with a hemoglobin value  $\leq 10$  g/dL was 52.3%. In the study by Sagiroglu et al, the hemoglobin value at admission was  $9.4 \pm 2.5$  g/dL.<sup>18</sup> In another study, the rate of patients with a hemoglobin value  $\leq 10$  g/dL at presentation was 25%.<sup>19</sup> In a study conducted by Restellini et al. in Canada, it was reported that the mean hemoglobin value of the patients at presentation was  $9.68 \pm 2.72$  g/dL.<sup>20</sup> In the comparisons, similar to our study, hemoglobin levels were low and blood urea levels were high at admission. Based on the analysis of the data in the literature and the data in our study, we can say that hemoglobin levels of patients with upper GI bleeding at admission are generally below the normal range and blood urea levels are above the normal range.

Comorbid diseases are among the most important factors affecting the clinical course and mortality in upper GI bleeding. The GBS and RS systems include the evaluation of comorbidities including heart failure, hepatic failure, renal failure, ischemic heart disease and malignancy.<sup>6,7</sup> According to our analysis, hypertension (53.5%), coronary artery disease (39.5%) and diabetes mellitus (27.9%) were the most common comorbidities in patients with upper GI bleeding, respectively. Similarly, Gökcek et al. found that the most common diseases were coronary artery disease (19.9%), malignancy (14.7%) and liver failure (13%),<sup>11</sup> Okutur et al. reported hypertension (46.2%), diabetes mellitus (22%) and ischemic heart disease (16.5%),<sup>16</sup>

Yalcin et al. reported hypertension (18.3%), coronary artery disease (17.3%) and diabetes mellitus (14.3%).<sup>4</sup> In a study conducted in Egypt, it was reported that nearly 60% of the patients had comorbidities, with ischemic heart disease being the most common (11%).<sup>21</sup> Yılmaz recently investigated the factors affecting mortality in patients with upper GI bleeding and reported hypertension as the most common comorbid disease.<sup>22</sup> As a result, comorbidities observed in patients in the literature are similar.

According to the analysis of the medications used by the patients, 74.6% of the patients were taking at least one medication that could pose a risk for bleeding. ASA (25.6%), NSAIDs (14.3%) and apixaban (7.1%) were the most commonly used drugs. Yenigün et al. found that NSAIDs (19.5%), ASA (18%) and OAC (3.6%) were used the most in their study.<sup>17</sup> In one study, ASA use was 32.9%, NSAIDs use was 27.7% and warfarin sodium use was 10.1%.<sup>15</sup> In similar studies conducted in the literature, ASA, NSAIDs, OAC and corticosteroid use was observed in the majority of patients.<sup>4,16,18</sup>

The rate of ES replacement was 51.2%. In the study by Sahin et al. the rate of patients who underwent ES replacement was 58.4%.<sup>15</sup> In another study, ES replacement was performed in 82.3% of patients.<sup>18</sup> In the study by Cimen et al, ES replacement was performed in 20.5% of the patients.<sup>19</sup> According to the GBS, a hemoglobin value <10 g/dL at presentation increases the risk of mortality. In our study, the rate of patients with a hemoglobin value <10 g/dL at presentation was 52.3%.

In our study, 91.9% of the patients underwent endoscopic procedure. According to the results, erosive gastritis (40.7%) and gastroduodenal ulcer (31.4%) were most common. In a recent study by Gökçek et al. 53% of patients had peptic ulcer, 12.8% had esophageal varices, 10.4% had malignancy and 6.1% had erosive gastritis.<sup>11</sup> In a similar recent study, Ekmen et al. observed that 46.7% of patients had gastritis and 43.7% had gastroduodenal ulcer.<sup>23</sup> In similar studies in the literature, it was observed that gastroduodenal ulcer and gastritis were the most common findings in patients.<sup>4,15-17,19, 21-23</sup>

In our study, 89.5% of the patients were initially treated in the intensive care unit. The mean duration of hospitalization was 6.74 days. In a similar study, Sahin et al. reported that 65% of the patients were hospitalized in the intensive care unit and the mean hospitalization period was 4.7 days.<sup>15</sup> In another study, the mean duration of hospitalization was reported to be 4 days.<sup>18</sup>

The mortality rate was 10.5% in our study. The mortality rate was reported as 4.5% in Yalcin et al.,<sup>4</sup> 5.7% in Gökçek et al.<sup>11</sup> and 10.3% in Yenigün et al.<sup>17</sup> The mortality rate observed in our study is close to the literature data. Since we evaluated the mortality rate based on hospitalized patients in this study, we can say that a higher mortality rate compared to some studies is an expected situation. In addition, mortality rate can be reduced with early endoscopic treatment methods

according to the centers where the studies were conducted. As a matter of fact, we think that inadequacies in endoscopic treatment procedures and the number of physicians in the hospital where our study was conducted increased mortality.

### Study Limitations

The retrospective design of the study is a limitation in terms of data access.

## Conclusion

In conclusion, from the data obtained in this study, we found that RS was more successful in predicting mortality in patients with upper GI bleeding. However, we think that it would be more successful to evaluate more than one system instead of a single scoring system in the diagnosis and treatment process of patients. As a result of our study, we obtained similar results to the literature data. We observed that the development of gastroduodenal ulcer due to drug use was high in patients. We would like to suggest that PPI use should be included in the prophylactic treatment of ASA, NSAIDs and OAC use in the risky patient group. In addition, according to the literature and the data of our study, we observed that the rates of hypertension and diabetes mellitus as comorbidities were high in patients with upper GI bleeding.

In our study, a comprehensive evaluation was made with demographic data, risk factors and endoscopy results in patients with upper GI bleeding from the time of presentation to the emergency department until the final outcome, and more than one risk scoring was evaluated and compared simultaneously. We think that our study will contribute to the literature in this respect. However, the most limited aspect of our study was the lack of a specialist of the relevant branch in the center where the study was conducted in the previous years and the fact that endoscopy was not performed regularly caused the small number of patients included in the study. We believe that further studies with a larger scale and with a larger number of patients will be useful.

## References

1. Adler DG, Leighton JA, Davila RE, Hirota WK, Jacobson BC, Qureshi WA, et al. ASGE guideline: The role of endoscopy in acute nonvariceal upper GI hemorrhage. *Gastrointest Endosc.* 2004;60(4):497-504.
2. Sung JJ. The role of acid suppression in the management and prevention of gastrointestinal hemorrhages associated with gastroduodenal ulcers. *Gastroenterol Clin North Am.* 2003;32(3):11-23.
3. Hearnshaw SA, Logan RFA, Lowe D, Travis SPL, Murphy MF, Palmer KR. Acute upper gastrointestinal bleeding in the UK: Patient characteristics, diagnoses and outcomes in the 2007

- UK audit. *Gut*. 2011;60(10):1327–35.
4. Yalcın MS, Kara B, Oztürk NA, Olmez S, Tasdogan BE, Taş A. Epidemiology and endoscopic findings of patients with upper gastrointestinal bleeding. *Dicle Medical Journal*. 2016;43(1):73-6.
  5. Dutta AK, Chacko A, Balekuduru A, Sahu MK, Gangadharan SK. Time trends in epidemiology of peptic ulcer disease in India over two decades. *Indian J Gastroenterol*. 2012;31(3):111–5.
  6. Rockall TA, Logan RF, Devlin HB, Northfield TC. Selection of patients for early discharge or out patient care after acute upper gastrointestinal haemorrhage. *National Audit of Acute Upper Gastrointestinal Haemorrhage*. *Lancet*. 1996;347:1138-40.
  7. Blatchford O, Murray WR, Blatchford M. A risk score to predict need for treatment for upper-gastrointestinal haemorrhage. *Lancet*. 2000;356:1318-21.
  8. Rassameehiran S, Teerakanok J, Suchartlikitwong S, Nugent K. Utility of the shock index for risk stratification in patients with acute upper gastrointestinal bleeding. *South Med J*. 2017;110(11):738-43.
  9. Dogru U, Yuksel M, Ay MO, Kaya H, Ozdemir A, Isler Y, et al. The effect of the shock index and scoring systems for predicting mortality among geriatric patients with upper gastrointestinal bleeding: a prospective cohort study. *Sao Paulo Med J*. 2022;140(4):531-9.
  10. Rady M, Smithline H, Blake H, Nowak R, Rivers E. A comparison of the shock index and conventional vital signs to identify acute, critical illness in the emergency department. *Ann Emerg Med*. 1994;24(4):685-90.
  11. Gökçek K, Ersel M, Altuncu YA, Karbek Akarca F, Kıyan S. Retrospective analyses of the utility of Glasgow-Blatchford and Rockall and Pre-Rockall scoring systems in patients admitted to the emergency department with upper gastrointestinal system bleeding. *Forbes J Med*. 2022;3(3):314-20.
  12. Saffouri E, Blackwell C, Laursen SB, Laine L, Dalton HR, Ngu J, et al. The shock index is not accurate at predicting outcomes in patients with upper gastrointestinal bleeding. *Aliment Pharmacol Ther*. 2020;51(2):253-60.
  13. Budimir I, Stojavljević S, Baršić N, Biščanin A, Mirošević G, Bohneć S, et al. Scoring systems for peptic ulcer bleeding: Which one to use? *World J Gastroenterol*. 2017;23(41):7450-8.
  14. Barkun A, Bardou M, Marshall JK. Consensus recommendations for managing patients with non variceal upper gastrointestinal bleeding. *Annals of Internal Medicine*. 2003;139(10):843-57.
  15. Sahin IO, Acehan S, Avcı A, Gülen M, Satar S. The relationship between pre-endoscopic rockall score and clinical course of patients presenting with non-variceal upper gastrointestinal bleeding in the emergency department. *Phnx Med J*. 2019;1(1):1-7.
  16. Okutur SK, Alkim C, Bes C, Gürbüz D, Kınık Ö, Gültürk E, et al. Acute upper gastrointestinal bleeding: Analysis of 230 cases. *Journal of Academic Gastroenterology*. 2007;6(1):30-6.
  17. Yenigün EC, Pirpir A, Aytan P, Ulusal G, Yıldırım İS. Evaluation of the characteristics of patients with upper gastrointestinal tract bleeding. *Journal of Academic Gastroenterology*. 2006;5(2):116-22.
  18. Sağıröglü MF, Calapkulu M, Gülten M. Retrospective evaluation of patients with acute upper gastrointestinal bleeding admitted to the gastroenterology clinic. *Uludag Medical Journal*. 2020;46(3):343-7.
  19. Cimen O, Cimen Keskin F. Upper gastrointestinal bleeding: Retrospective analysis of 68 patients in the last 5 years. *Journal of Erzincan University Graduate School of Science and Technology*. 2020;13(1):364-8.
  20. Restellini S, Kherad O, Jairath V, Martel M, Barkun AN. Red blood cell transfusion is associated with increased rebleeding in patients with non-variceal upper gastrointestinal bleeding. *Aliment Pharmacol Ther*. 2013;37(3):316-22.
  21. Gado AS, Ebeid BA, Abdelmohsen AM, Axon AT. Clinical outcome of acute upper gastrointestinal hemorrhage among patients admitted to a government hospital in Egypt. *Saudi J Gastroenterol*. 2012;18:34-9.
  22. Yılmaz Y. Factors affecting mortality in patients admitted to the emergency department with gastrointestinal system bleeding. Medical specialty thesis, Necmettin Erbakan University, Meram Faculty of Medicine, Department of Emergency Medicine, Konya, 2020.
  23. Ekmen MO, Uyanıkoglu A, Efe SC, Yenice N. Analysis of patients with non-variceal upper gastrointestinal bleeding and seasonal distribution. *Journal of Harran University Faculty of Medicine*. 2021;18(1):50-3.