Orginal Article
Eurasian Journal of Critical Care

A Comparison of The Glasgow-Blatchford Score And Pre - Endoscopic Rockall Score Systems To Predict Clinical Outcomes in Patients With Upper Gastrointestinal Bleeding

Alev Eceviz[1], Vehbi Özaydın[1], Fatma Sarı Doğan[2]

[1] İstanbul Medeniyet Üniversitesi, Tıp Fakültesi

[2] İstanbul Fatih Sultan Mehmet Eğitim ve Araştırma Hastanesi, Acil Tıp Kliniği

Abstract

Objectıve: Acute upper gastrointestinal system bleeding in patients presenting at the Emergency Department is a significant cause of morbidity and mortality. Different scoring systems have been developed for the evaluation in emergency department of patients with gastrointestinal system bleeding. Emergency endoscopy may not be possible in patients presenting to the emergency department with gastrointestinal bleeding. The aim of this study was to compare pre – endoscopic scoring systems (Like the Glasgow Blatchford Score and the pre -endoscopic Rockall scoring systems) in patients presenting at the emergency department with upper gastrointestinal system bleeding, to determine high-risk patients and examine the efficacy of these systems in predicting 30-day mortality.

Method: This prospective study included patients aged >18 years who presented at the Emergency department of XXX Training and Research Hospital between January 2014 and December 2014.

Results: The study included a total of 101 cases with a mean age of 65.62 years (range, 19-97 years). Melena was determined in 45 (44.6%) patients, hematochezia in 25 (24.8%), hematemesis in 26 (25.7%), diarrhea and abdominal pain in 7 (6.9%) and syncope in 1 (1.0%). The mean Blatchford score of the patients was 10.56±3.75 (range, 3-19). According to this scoring system, 6 (5.9%) patients were at moderate risk, 18 (17.9%) at high risk, and 77 (76.2%) at very high risk. The mean pre – endoscopic Rockall score was 3.11±2.37 (range, 0-9). According to this scoring system, 49 (48.5%) patients were at low risk, 22 (21.8%) at moderate risk, and 30 (29.7%) at high risk.

Of the 49 cases identified as low risk with the pre- endoscopic Rockall classification, 4 were classified as moderate risk, 14 as high risk, and 31 as very high risk using the Blatchford scoring system. Of the 22 cases identified as moderate risk with the pre- endoscopic Rockall classification, 1 was classified as moderate risk, 2 as high risk, and 19 as very high risk using the Blatchford scoring system. Of the 30 cases identified as high risk with the pre – endoscopic Rockall classification, 1 was classified as moderate risk, 2 as high risk, and 27 as very high risk using the Blatchford scoring system. The differences between the two scoring systems were determined to be statistically significant.

No statistically significant difference was determined between the mortality rates of cases according to the Blatchford scoring ($p>0.05$). The difference between the mortality rates of the cases according to the pre – endoscopic Rockall scoring was determined to be statistically significant ($p=0.001$, $p<0.01$). The mortality rate of patients at high risk according to the pre – endoscopic Rockall scoring was determined to be higher. The difference between the mortality rates of the cases at high risk according to the pre- endoscopic Rockall scoring was determined to be statistically significant ($p=0.001$, $p<0.01$). The risk of mortality was determined to be 6.022-fold greater in cases at high risk according to the pe - endoscopic Rockall scoring. The odds value for pre-endoscopic Rockall scoring was 6.022 (95% CI: 2.148-16.882).

Conclusion: The Blatchford and pre- endoscopic Rockall scoring systems were not seen to be consistent with each other and in the prediction of mortality, pre- endoscopic Rockall scoring was determined to be better.

Key words: Emergency Department, Gastrointestinal bleeding, pre- endoscopic Rockall scoring system, Glasgow-Blatchford scoring system

Introduction

Upper gastrointestinal bleeding is defined as bleeding that originates proximal to the Treitz ligament. When evaluating the patient, stabilisation must be applied at the same time as the classic physical examination, taking the medical history and laboratory tests[1].

Risk evaluation before endoscopy, which can be evaluated during the first presentation in emergency department (ED), is based on clincal and laboratory parameters. Rapid evaluation of these provides a great advantage. These systems before endoscopy include the pre- endoscopic Rockall (pRS) and Blatchford (GBS) systems[2]. The Rockall system before endoscopy is based on the patient age, comorbidities and blood pressure values. The Blatchford system does not consider the age, but includes basic laboratory tests, such as urea and hemoglobin levels. The purpose of this is prediction before the need for any intervention[3,4]. If risk evaluation is made during endoscopy, endoscopic signs are examined. These signs are determinants of the subsequent clinical course and endoscopic intervention. The combination of clinical, laboratory and endoscopic data is used in the risk scores after endoscopy.

Corresponding Author: Alev Eceviz **e-mail:** alevdenizli@yahoo.com
Received: December 10, 2021 • **Accepted:** December 14, 2021
Orcid: https://orcid.org/0000-0002-6808-9393

Alev Eceviz **e-mail:** alevdenizli@yahoo.com
Vehbi Özaydın **e-mail:** vozaydin@hotmail.com
Fatma Sarı Doğan **e-mail:** fatmasdogan@gmail.com

The Rockall (Total Rockall) score after endoscopy is widely used. When these scores are compared with the pre-endoscopy scores, they are more appropriate for the prediction of re-bleeding and mortality. The use of information provided by endoscopy has a significant advantage, but there is also the disadvantage of a delay in the results as it is performed after endoscopy[5].

The aim of this study was to determine the most effective scoring system by comparing the risk scores frequently used in patients with upper gastrointestinal system (GIS) bleeding.

Material – Method

Approval for this prospective cross-sectional study was granted by the Local Ethics Committee. The study was conducted in the Emergency Department (ED) of XXX Training and Research Hospital between January 2014 and December 2014. In this period, a total of 101 patients aged >18 years presented at the ED, and as a result of examinations and tests were diagnosed with upper GIS bleeding. For each patient, the Blatchford and pre- endoscopic Rockall scores were calculated. For various reasons, endoscopy was not applied and as it was more practical to apply the pre- endoscopic Rockall scoring in the ED, this was used rather than the total Rockall score. These two scores were compared in respect of determining the mortality risk.

Statistical Analysis

Data obtained in the study were analysed statistically using NCSS 2007 software (Number Cruncher Statistical System, Kaysville, Utah, USA). Descriptive statistical methods were stated as mean±standard deviation, median, minimum, maximum values or number(n) and percentage (%). In the comparison of qualitative data, the Pearson Chi-square test, Fisher-Freeman-Halton Exact test and Fisher Exact test were used. In the evaluation of the levels of the Blatchford and pre- endoscopic Rockall scores able to determine mortality, diagnostic screening tests (sensitivity, specificity, positive predictive value [PPV] and negative predictive value [NPV]) were used. A value of $p<0.05$ was accepted as statistically significant.

Results

Between January and December 2014, evaluation was made of a total of 101 patients, comprising 60 (59.4%) males and 41 (40.6%) females with a mean age of 65.62±18.85 years (range, 19-97 years).

Mean systolic blood pressure was determined as 106.25±19.97 (range, 50-180), mean diastolic blood pressure as 66.97±13.52 (30-100) and mean pulse measurement was 92.99±17.05 (range, 50-145).

The complaints of the patients on presentation were melena in 45 (44.6%) patients, hematochezia in 25 (24.8%), hematemesis in 26 (25.7%), diarrhea and abdominal pain in 7 (6.9%) and syncope in 1 (1.0%) (Figure 1).

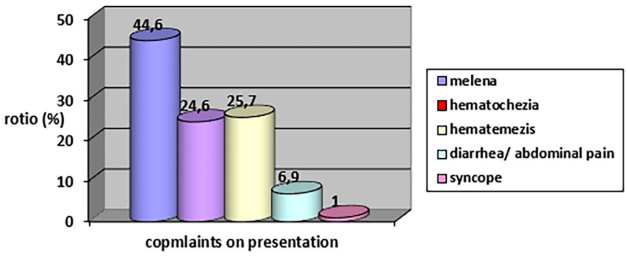

Figure 1: Complaints on presentation

The mean hemoglobin value was 9.64±2.80 (range, 3.6-16.1), with a value <8 determined in 30 (30.3%) patients and ≥8 in 69 (69.7%) patients.

The mean PLT value was 262.25±143.63 (range, 3.4-838). The mean MPV (mean platelet volume) measurement was 8.48±2.21 (range, 5.1-16.6) and mean INR measurement was 1.55±1.53 (range, 0.9-10.3).

A total of 97 (96.0%) patients were hospitalised for treatment; 4 (4.0%) were admitted to the Intensive Care Unit (ICU) and 93 (92.1%) to the wards. Endoscopy was applied to 77 (76.2%) patients, re-bleeding was seen in 1 (1.0%) patient, and comorbidities were seen in 91 (90.1%).

Mortality developed in 21 (20.8%) patients.

The mean Blatchford score of the patients was 10.56±3.75 (range, 3-19). According to this scoring system, 6 (5.9%) patients were at moderate risk, 18 (17.9%) at high risk, and 77 (76.2%) at very high risk.

The mean pre- endoscopic Rockall score was 3.11±2.37 (range, 0-9). According to this scoring system, 49 (48.5%) patients were at low risk, 22 (21.8%) at moderate risk, and 30 (29.7%) at high risk (Figure 2).

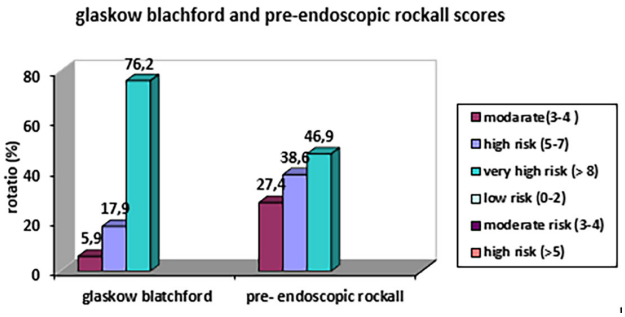

Figure 2: Blatchford and pre – endoscopic Rockall scores

Of the 49 cases identified as low risk with the pre – endoscopic rockall classification, 4 were classified as moderate risk, 14 as high risk, and 31 as very high risk using the Blatchford scoring system.

Of the 22 cases identified as moderate risk with the pre – endoscopic Rockall classification, 1 was classified as moderate risk, 2 as high risk, and 19 as very high risk using the Glaskow Blatchford scoring system.

Of the 30 cases identified as high risk with the pre – endoscopic Rockall classification, 1 was classified as moderate risk, 2 as high risk, and 27 as very high risk using the Blatchford scoring system.

Accordingly no statistically significant compatibility was determined between the two scoring systems (Kappa: 0.046; p:0.322; p>0.05).

No statistically significant difference was determined between the mortality rates of cases according to the Blatchford scoring (p>0.05). The difference between the mortality rates of the cases according to the pre – endoscopic Rockall scoring was determined to be statistically significant (p=0.001, p<0.01). The mortality rate of patients at high risk according to the pre – endoscopic Rockall scoring was determined to be higher. No statistically significant difference was determined between the mortality rates in cases at high and very high risk acccording to the Blatchford scoring (p>0.05).

The difference between the mortality rates of the cases at high risk according to the pre – endoscopic Rockall scoring was determined to be statistically significant (p=0.001, p<0.01). The risk of mortality was determined to be 6.022-fold greater in cases at high risk according to the pre – endoscopic Rockall scoring. The odds value for pre – endoscopic Rockall scoring was 6.022 (95% CI: 2.148-16.882) (Figure 3).

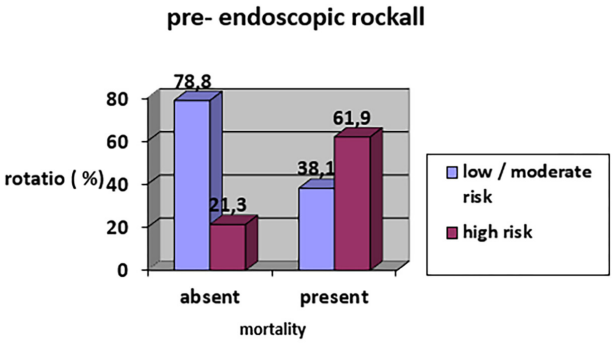

Figure 3: Mortality rates according to the pre – endoscopic Rockall scoring

According to the presence of mortality, those at high and very high risk (≥5) in the Blatchford scoring, sensitivity was 90.48%, specificity 5%, PPV 20%, NPV 66.7% and accuracy was 22.77%. In the ROC obtained, the area under the curve (AUC) was determined as 47.7% and standard error as 7.3%, which was not found to be statistically significant (p>0.05).

According to the presence of mortality, those at high and very high risk (≥5) in the pre – endoscopic Rockall scoring, sensitivity was 61.90%, specificity 78.5%, PPV 43.33%, NPV 88.73% and accuracy was 75.25%. In the ROC obtained, the AUC was determined as 70.3% and standard error as 6.8%. This area was found to be statistically significant (p<0.01).

The Glaskow Blatchford and pre – endoscopic Rockall scoring systems were not seen to be consistent with each other and in the prediction of mortality, pre – endoscopic Rockall scoring was determined to be better.

Discussion

Acute upper GIS bleeding is frequently encountered in ED as a cause of morbidity and mortality, and is responsible for 500,000 hospital admissions per year in the USA. The annual incidence is up to 165 per 100,000. Despite developments in medical treatment, ICU management, endoscopy and surgical fields in the last 20 years, mortality remains at approximately 13%-14% [6]. As for every disease, for the proper management of patients with GIS bleeding, correct grouping in respect of recurrence and mortality is necessary. The categorisation of low and high risk patients on presentation is important. When patients are classified according to severity, the management of GIS bleeding patients is more effective and morbidity and mortality are reduced[7].

An ideal scoring system determines acute upper GIS bleeding and should be able to differentiate between low risk and high risk patients who may develop repeated bleeding and mortality. Several scoring systems have been developed in recent years to be able to differentiate patients who should be hospitalised for the application of aggressive treatment and patients who can be treated as outpatients. Of these, the Rockall score (RS- pre-endoscopic RS), Total RS (including endoscopic findings) and the Glasgow Blatchford score are systems used in ED to classify patients presenting with upper GIS bleeding[8, 9]. There are several reasons for upper GIS bleeding, and these reasons often show differences depending on the age of the patient. However, gastric and duodenal ulcer hemorrhages account for three-quarters of all cases. Accordingly, patients often present at ED with complaints of hematochezia and melena[10]. The complaints on presentation of the patients in the current study were seen to be consistent with findings in literature (Figure 1). There are several studies in literature related to upper GIS bleeding, and the common point of these studies is that one of the most important factors affecting mortality is re-bleeding[2, 8].

The Rockall scoring system gives an idea about the probability of mortality. The Rockall score is formed of three non-endoscopic measurements (age, shock, comorbidities) and two endoscopic measurements. This system was developed from a prospective study by Rockall et al which evaluated independent risk factors for mortality in

4185 cases of acute upper GIS bleeding and the subsequent prospective evaluation of another group of 1625 patients in the same study. Rockall et al attempted to predict mortality with simple variables. According to the study, in patients with a score of 0-1-2, the risk of re-bleeding is <5% and thus there is a low probability of mortality. In the moderate risk group of those with a score of 3-4, the risk of mortality is increased approximately 5-fold. Patients with a score of 5-7 have a 3-fold increased risk and those with a score of 8 have a 2-fold increased risk[2].

In the current study, we planned to predict mortality in the patients group who could not undergo emergency endoscopy and the clinical Rockall score (pre endoscopic RS), calculated before endoscopy, was applied

In cases at high risk according to the clinical Rockall scoring, the risk of mortality was 6.022-fold greater. The ODDS value for Rockall scoring was determined as 6.022 (95% CI: 2.148-16.882). According to this, the clinical Rockall scoring system was found to be significant in predicting mortality.

In 1997, Blatchford et al published a prospective, multi-centre study of the epidemiology and mortality of upper GIS bleeding in patients in the west of Scotland[3]. Then with a prospective study in 2000, the Glasgow-Blatchford score was confirmed in 197 patients presenting with upper GIS bleeding[10]. This risk classification system does not include an endoscopic component, but the measured result shows whether there is a need for clinical intervention to control the bleeding and whether or not the patient would benefit from endoscopy. The Glasgow-Blatchford score performance has been compared with the Rockall score in the prediction of the need for intervention and has been found to have significantly better capability in this prediction. There are also studies that have found the Blatchford and Rockall scores to be equal in the prediction of mortality[2, 8,9,10]. However, unlike the previous literature, no statistically significant difference was seen in the mortality rates of the current study cases at high and very high risk according to the Blatchford score. According to Tham T.C.K et al. , they studied the clinical rocall scoring system in acute non-variceal upper gastrointestinal haemorragia and defined the pre-endoscopic rockall scoring system as useful[11].

In conclusion, the Blatchford and pre-endoscopic Rockall scoring systems were not seen to be consistent with each other and in the prediction of mortality, pre- endoscopic Rockall scoring was determined to be better (Figure 3). By accepting the high risk of mortality, monitorisation and close follow-up is recommended for cases determined as high risk according to pre-endoscopic Rockall scoring.

Limitations

There were some limitations to this study, primarily that it was conducted in a single centre. In addition, under nighttime conditions in our hospital, emergency endoscopy is not applied. Furthermore, as our hospital is an advanced centre on this subject, patients with more comorbidities at high risk of mortality were transfered to our hospital and were included in the evaluation.

References

1. Ziebell M.C , Kitlowski D.A, Welch J , Friesen P . Upper Gastrointestinal Bleeding, Chapter 75 in Tintinalli's emergency medicine : A Comprehensive study Guide , Ninth Edition ; 2020: 495-498
2. Rockall TA, Logan RF, Devlin HB, et al. Risk assessment after acute upper gastrointestinal haemorrhage. Gut 1996;38:316-21.
3. Blatchford O, Davidson LA, Murray WR, et al. Acute upper gastrointestinal haemorrhage in west of Scotland: case ascertainment study. BMJ, 1997; 315: 510-514.
4. Blatchford O, Murray WR, Blatchford M. A risk score to predict need for treatment for upper gastrointestinal haemorrhage. Lancet 2000; 356: 1318–21.
5. Kuipers EJ. Improved risk assessment in upper GI bleeding. Gastrointest Endosc, 2011; 74: 1225-1229
6. Eric Goralnick and David A. Meguerdichian ; Gastrointestinal Bleeding; Chapter 27 İn Rosen's Emergency Medicine: Concepts And Clinical Practice, Ninth Edition Philadelphia, Elsevier Sounders, 2018 :242 - 248
7. Palmer K. British Society of Gastroenterology Endoscopy Committee. Non-variceal upper gastrointestinal haemorrhage: guidelines. Gut, 2002; 51:iv1-iv6.
8. Dicu D, Pop F, Ionescu D, et al. Comparison of risk scoring systems in predicting clinical outcome at upper gastrointestinal bleeding patients in an emergency unit. AJEM, 2013; 31: 94-99.
9. Konyar Z , Guneysel O , Dogan S.F , Gokdag E ; Modification of Glaskow- Blachford scoring with lactate in predicting the mortality of patients with upper gastrointestinal bleeding in emergency department ; Hong Kong Journal of Emergency Medicine 2019, vol. 26 (1) 31-38
10. Blatchford O, Murray WR, Blatchford M. A risk score to predict need for treatment for upper gastrointestinal haemorrhage. Lancet 2000;356: 1318-21
11. Tham T.C.K , James C , Kelly M , Predicting outcome of acute non-variceal upper gastrointestinal haemorrhage without endoscopy using the clinical Rockall Score . Postgrad Med J. 2006 Nov;82(973):757-9.