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ROCK ALL SCORE IN NONVARICEAL UPPER GASTROINTESTINAL BLEEDING (NVUGIB): A PREDICTOR OF IN-HOSPITAL REBLEEDING

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Keywords:
Upper gastrointestinal; Bleeding; Endoscopy

Abstract

Introduction: Although the Rockall scoring system is designed to predict morbidity, mortality and bleeding in patients, the accuracy and validity of these indicators had not been reviewed among the patients of the north of Iran, Guilan. The aim of this study was to evaluate the Rockall scoring system among primary nonvariceal upper gastrointestinal bleeding (NVUGIB) patients in Guilan province, north of Iran.

Materials and Methods: This cross-sectional study was performed in 197 patients with primary nonvariceal manifestation of upper gastrointestinal bleeding at a reference educational hospital. All patients underwent endoscopy within 12 hours of presentation of symptoms. After demographic data, endoscopic findings and history of gastrointestinal diseases registrations, Rockall scores were calculated. Also, the patients were divided into three groups: (1) low risk, (2) intermediate risk and (3) high risk.

Results: Twenty-seven of the patients were classified as high risk (21 males and 6 females). Eleven of them were aged 80 years old and 6 cases were older. The number of cases with the history of alcohol consumption and smoking were 3 and 7, respectively. Previous gastrointestinal bleeding history and previous endoscopy history were observed among 4 subjects in two different groups. Six of eight patients with rebleeding were considered as high risk group. The mean Rockall score among patients with and without rebleeding were 2.9±1.7 and 6±1.8, respectively (P= 0.02). Validation of Rockall score showed accuracy of 0.995 with 95% confidence between 0.983-1.000. High risk group patients, with Rockall scores greater than 6, had the possibility of rebleeding with the sensitivity of 100% and the specificity of 93.3%.

Conclusion: According to the results of this study, the Rochall score was effective in rebleeding prediction. Therefore, we recommend the use of this score in emergency departments for patients in order to additional monitoring and treatment for prevention of rebleeding in hospital.

Introduction

Upper gastrointestinal bleeding (UGIB) is one of the most common internal medicine emergencies (1-3). Despite newest treatments, the mortality rate of UGIB is 5-10%. Evidence supports that recurrent bleeding experience after primary homeostasis occurs within 10-20 percent of patients (4), which is considered to be the main cause of UGIB mortalities (4). Attempts to predict the adverse outcomes in patients with UGIB have been the subject of many studies for decades (5) which have led to several scoring system developments to identify the high risk patients

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requiring additional medical care. Rockall scoring system is one of the preferred models among the five existing well-established scoring systems, which determines the high risk patients admitted with acute UGIB, using endoscopic and clinical parameters. The clinical score of Rockall scoring system can be simply obtained by reviewing patients' clinical manifestations. However, calculating the total score of Rockall requires performing upper gastrointestinal endoscopy. The Rockall scoring system categorizes patients into low risk and high risk groups related to the adverse outcomes of UGIB (6). It provides scores between 0 to 11, the total score of 11 representing the highest risk and the total score of 2 or less (equivalent to zero in the "clinical" score of Rockall) indicating the lowest risk for recurrent UGIB mortality. Previous research with validation of the system suggests that patients with a score less than 2 could be treated as outpatients with no need for hospital admission (7). The Rockall score has been used in many different studies, however, it has never been investigated and validated in patients admitted to the hospital for UGIB in north of Iran. According to the critical role of the UGIB patients monitoring, it is important to determine the performance of Rockall score in identifying which patients are at high risk for rebleeding. This study investigates the total Rockall score for the prediction of north of Iran patient's status with upper gastrointestinal bleeding.

Materials and methods

This cross-sectional prospective study was performed in all patients with the primary diagnosis of acute UGIB who were admitted to Emergency department of Razi Hospital in Rasht as a reference educational center in the north of Iran, between 2013 and 2014. The Medical Ethics Committee of Guilan University of Medical Sciences (GUMS) has approved the study design, protocols and informed consent was obtained from all participants. The diagnosis of acute UGIB was made at the presentation of hematemesis, melena, bloody aspiration through nasogastric tube or a strong clinical suspicion of UGIB with an unexplained drop in hemoglobin levels. Exclusion criteria included the history of anemia caused by chronic UGIB, hemoglobinopathies, other chronic diseases, age equal to or less than 14 years, and unavailable endoscopic data due to the patient refusal. For each of the patient participating in the study, a questionnaire was filled. Data such as age, sex, clinical manifestations (hematemesis, melena), comorbidities (including gastrointestinal and nongastrointestinal diseases including cardiovascular diseases, cerebrovascular diseases, chronic lung diseases, chronic liver diseases and any kind of cancers) history of smoking and alcohol consumption were also registered. A "clinical" Rockall score was calculated based on the patients' age, state of shock (based on the primary heart rate and systolic blood pressure) and comorbidities. All patients underwent upper endoscopy between the first 6 to 12 hours of hospital admission. After performing upper gastrointestinal endoscopy, the results of endoscopy were recorded for each patient. The endoscopic score was added to the clinical Rockall score for each individual and the total Rockall score was calculated. As shown in Table1, the total Rockall score was 0 to 11, the score of 11 indicating the highest risk of mortality. While the score of 2 or less was associated with the low risk of UGIB mortality. The score of 3 to 5 was associated with the moderate risk and the score of 6 or higher was related to the higher risk of recurrent bleeding and mortality (7). Patients were under detailed surveillance during their hospitalization. The clinical evidence of rebleeding included at least one of the followings: recent hematemesis and melena, vomiting of blood, bloody stools, decreased hemoglobin, decreased red blood cell count or blood in nasogastric aspiration within 24 hours of the first clinical manifestation, under observation of the nursing staff. Hematemesis was defined as vomiting of fresh and clear blood or coffee ground vomiting. Melena was defined as the loose black tarry stinky and sticky stool. The results of the predictive ability of the Rockall scoring system were calculated using SPSS Version 20. Descriptive statistics were presented including frequency, frequency percent and mean. Also, t-test and ANOVA were used to analyze the data and the qualitative data were analyzed using the Chi square. To assess the validity of the Rockall scoring system, the receiver operating characteristic curve (ROC) was calculated. Bilateral P values less than 0.05 were considered statistically significant.

Results

During the study period, 683 patients with UGIB were admitted. From these individuals 197 patients who had primary nonvariceal bleeding origin were enrolled based on the inclusion criteria. It should be stated that none of these were missed over the study. The patients' characteristics and their Rockall scores are shown in Table 2. Totally, 72 patients had clean base ulcers, 8 patients had flat pigmented spots, 6 patients had adherent clots on their ulcers and 36 patients had active bleeding ulcers. Finally, 73 patients had nonulcerative gastropathies. The mean total Rockall score for all cases in our study was 3.1±1.8.

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According to the Rockall score, 27 patients were classified as high risk (21 Males/ 6 Females). Among the high risk group, 11 patients were between 60-80 years old and 6 patients were older than 80. Three high risk patients (11.1%) had a history of alcohol consumption and 7 patients (25.9%) had a history of smoking. Also, 4 patients (14.8%) had a history of gastrointestinal bleeding and 4 patients (14.8%) had a history of endoscopy in the high risk group.

In our study, only 8 of the 197 patients experienced recurrent bleeding during the follow-up period after endoscopy; 6 cases were in the high risk group and 2 cases were in the moderate risk group, based on Rockall scores. Among 2 of the 6 patients with rebleeding, one was referred to the ICU and the other was referred to the surgery department. These two patients were in the high risk group and their Rockall scores were greater than 6. The mean Rockall score of patients who did not have rebleeding was 2.9±1.7, while the patients with rebleeding mean Rockall score was 6±1.8 (P= 0.02).

With the exception of 8 patients who had rebleeding, the mean duration of hospitalization was 2.96 days. This subgroup had 7 days as mean duration of hospitalization. According to the Rockall score, it was found that low risk, moderate risk and high risk groups were hospitalized for 2.72±1.20, 2.85±1.44 and 4.20±2.23 days, respectively (P<0.0001).Validation of the Rockall score showed an accuracy of 0.995 with 0.95% confidence interval between the ranges of 0.983-1.000. Area under the curve (AUC) was 91% (P<0.001). Our results showed that the highest sensitivity and specificity of the Rockall score for determining the risk of recurrent bleeding was related to the score 5. According to our study, Rockall score greater than 4 have a higher risk of rebleeding with sensitivity of 87.5% and specificity of 81.7% (**Figure 1**).

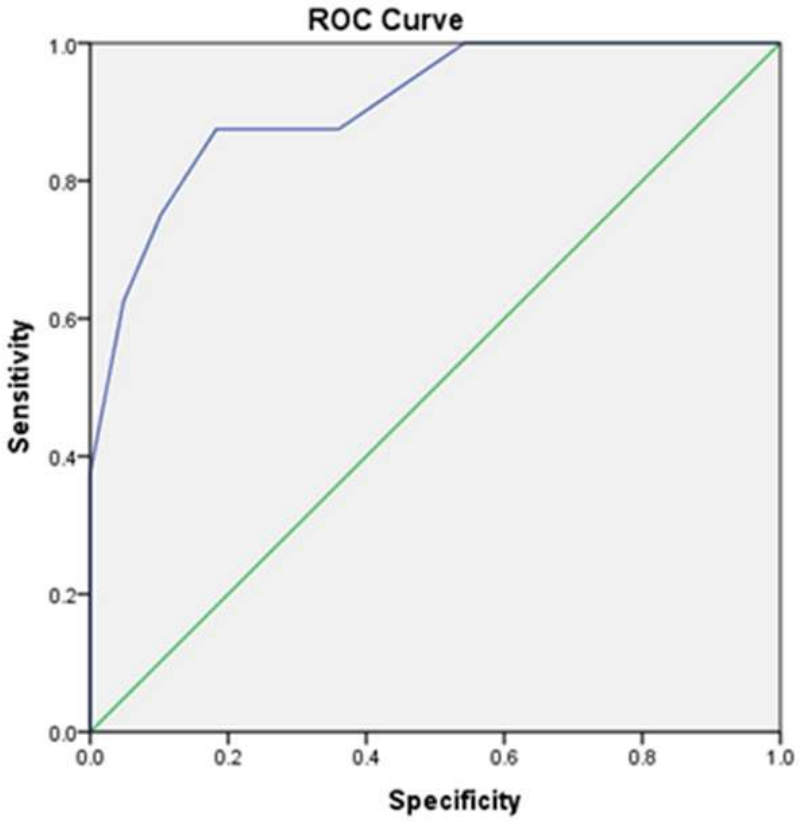

Fig.1 Evaluation of sensitivity and specificity of Rockall score according ROC test

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Table1. Rockall scoring system (7)

	Scores			
Variables	**0**	**1**	**2**	**3**
Age	<60	60-79	>80	
Shock	No shock	PR>100 bpm	Systolic BP<100 mmHg	
Comorbidity			Heart failure Major organ involvement	Kidney failure Hepatic failure Metastatic cancer
Diagnosis	Mallory-Weiss tear	Other diagnosis	Malignancy of gastrointestinal tract	
Evidence of bleeding			Blood Adherent clot Visible vessel	

Table2.Patients characteristics and endoscopic evidence based on Rockall score

Demographic data		Total GI Bleeding n (%)	Rockall score n (%)		
			Low risk 87(44)	Moderate risk 83(42)	High risk 27(14)
Sex	Men	140 (71.6)	61 (43.4)	58 (41.8)	21 (14.8)
	Women	57 (28.4)	26 (46.5)	25 (43.8)	6 (9.7)
Age	<40	35 (17.7)	24 (68.5)	10 (28.5)	1 (3)
	40-60	58(29.6)	29 (50)	20 (34.5)	9 (15.5)
	60-80	81 (41.1)	34 (41.9)	36 (44.4)	11 (13.5)
	>80	23 (11.6)	0 (0)	17 (73.9)	6 (26.1)
Alcohol consumption	No	182 (92.3)	77 (43.3)	81 (44.5)	24 (13.2)
	Yes	15 (7.7)	10 (66.6)	2 (13.4)	3 (20)
Smoking	No	154 (78.2)	63 (40.9)	71 (46.1)	20 (13)
	Yes	43 (21.8)	24 (55.8)	12 (27.9)	7 (16.3)
History of GI bleeding	No	178 (90.3)	78 (43.8)	77 (43.2)	23 (13)
	Yes	19 (9.7)	9 (47.3)	6 (31.5)	4 (20.2)
Hemoglobin Level		10.01±2.86	10.74±3.25	9.59±2.42	8.94±2.10
History of endoscopy	No	180 (91.3)	77 (42.7)	80 (44.4)	23 (12.9)
	Yes	17 (8.7)	10 (58.8)	3 (17.6)	4 (23.6)
Endoscopic findings	Clean base ulcer		48 (55.3)	22 (26.5)	2 (4)
	Adherent clot		0 (0)	6 (7.2)	2 (4)
	Flat pigmented spot		0 (0)	3 (3.6)	5 (20)
	Visible vessel / active bleeding		2 (2.4)	18 (21.7)	16 (64)
	Other results(Erosive Gastropathy)		37 (42.4)	34 (41)	2 (4)

GI: Gastrointestinal

Discussion

Owing to the high morbidity, mortality and the considerable clinical and economic burden, the importance of upper gastrointestinal bleeding is remarkable (8, 9). Gastrointestinal bleeding includes approximately 20% of emergency department visits, 5% of emergency admissions and about 2% of hospital admissions(10) . Management of nonvariceal upper gastrointestinal bleeding (NVUGIB) includes medical, endoscopic and radiologic procedures. Recent studies have shown that medical therapy in addition to the endoscopic techniques result in the recovery of about 90% of patients (11-13). Although the positive impact of endoscopic therapy in the control of acute bleeding in the NVUGIB patients has been demonstrated, the risk of recurrent bleeding is considerable (14). In this study we discussed the validation of the Rockall score in the prediction of rebleeding among north of Iran patients.

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Using the total Rockall score to predict the risk value of the patients with UGIB, we identified 27 patients who were at high risk, 2 cases (4%) had clean base ulcers, 2 cases (4%) had adherent clots, 5 cases (20%) had flat pigmented spots and 16 cases (64%) had visible vessel/active bleeding. Based on these findings, 18 out of 27 high risk patients (66.6%) needed instant endoscopic procedures.

The considerable mortality rate in patients with UGIB bleeding is mainly associated with recurrent UGIB (15). Therefore, the estimation of the bleeding recurrence probability and subsequent mortality in patients with upper gastrointestinal bleeding in hospitals is critical.

According to our results, we found out the importance of Rockall score in our research center. Also, it would allow the physicians to diagnose patients who requiring additional monitoring in order to reduce the virulence and mortality related to the GI bleeding complications.

As investigated in this study, it is suggested that the Rockall score was an accurate tool to classify the patients who need to be under longer monitoring in the hospital. Previously, Lee et al. showed similar results (16). Church and his colleagues demonstrated the successful use of the Rockall scoring in predicting rebleeding and subsequent mortality rates in patients who were diagnosed with peptic ulcer disease via endoscopy. Their results suggested that the Rockall score was effective in predicting mortality. In contrast to our study, it was not effective in determining possible rebleeding (17). Also, Wang evaluated the Rockall score as a predictor tool for recurrent bleeding, mortality and the need for surgery. Their results were similar to our study (18). A study by Sarwang et al. was assessed the validity of Rockall scores on cirrhotic patients with variceal hemorrhage. They supported the proper validity of Rockall score in predicting the mortality and incidence of hospital rebleeding in their population (19). In our study, no deaths were reported. Therefore, evaluation of the percentage and predicting the mortality was not possible by Rockall score.

Because of the short timeframe of this study, insufficient sample size and some essential data missing which were related to the patients' hemoglobin level, need a blood transfusion, ICU admission requirement and costs of hospitalizations for each patients; further studies are required to recover all the above mentioned issues.

In conclusion, most of the patients with rebleeding were in the high risk group, based on their Rockall score. These patients required additional care and monitoring. On the other hand, we found a positive relationship between the Rockall scores and total patients' hospitalization duration in our study. As a matter of fact, 87 patients (44.1%) were classified as low risk and the duration of their hospitalization was a maximum of 3 days due to the low risk of rebleeding. Although, they could receive outpatient follow-up later, high risk patients needed more hospitalization time. Also, the risk of rebleeding was much higher for them. We did not find out any studies about the relationship between the Rockall score and hospitalization duration.

Our study showed that patients with Rockall score greater than 4 are in the high risk group and should be under more supervision and care. Previously, different values had been provided for the level of high risk scoring. Most of these reports mentioned score 2 or more as high risk scores (7, 17, 19).

Conclusion

Perhaps greater scores should be considered as high risk scores among our research center patients. Based on the results of this study, we recommend a full Rockall scoring with endoscopic criteria which should be calculated for patients with UGIB. Furthermore, if this score is above 6, the patient must receive additional monitoring and treatment.

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