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Original Research Article

Upper gastro intestinal bleed: causes, endoscopic profile and usefulness of Rockall score in determining the outcome

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ABSTRACT

Background: Upper gastrointestinal hemorrhage is defined as any bleeding from a site in the gastrointestinal tract proximal to the ligament of Treitz (fore-gut). Patients with Upper gastrointestinal hemorrhage present with a wide range of clinical severity ranging from trivial bleeds to fulminant and lethal exsanguinations. It is associated with multiple risk factors and multiple co-morbid condition.
Methods: A prospective cross-sectional study was conducted in a tertiary care hospital. A total of 56 patients who were subjected to endoscopy and were studied for 6 months. Appropriate statistical method had been applied wherever needed.
Results: In the studied population among 56 patients, most common cause of UGIB was variceal bleed 45 (80%); most common of age group with variceal bleed belonged to 40-59 years, Grade III varices were most commonly found 23 (52%). The mean Rockall score was 4.7 which indicated that most patients belong to moderate risk group. The need of packed red blood cell transfusion and chances of rebleeding were more in high-risk group compared to low and moderate risk group. Patient mortality were only observed in high-risk group compared to low and moderate risk group.
Conclusions: Upper GI endoscopy is beneficial in both diagnostic and therapeutic treatment of patients with UGIB. Rockall score helped in identifying that most of the patients belonged to moderate and high-risk group. Rockall score has been found to correlate well with clinical outcome, including need for transfusions, rebleeding and mortality, and may be used for effective triage of patients.

Keywords: Upper gastrointestinal hemorrhage, Rockall score, Endoscopy

INTRODUCTION

Upper Gastrointestinal haemorrhage is one of the common emergencies met in clinical practice. The mode of presentation is diverse and depends on the cause and the amount of blood loss. It can present with a spectrum of clinical severity that ranges from trivial and insignificant bleeds to fulminant andmlethal exsanguinations. The overall incidence of upper GI bleeding is approximately 125 hospitalizations for every 1,00,000 people, with a male to female ratio of 2:1. Bleeding from upper GI tract is five times as common as lower GI bleed. Mortality from acute GI bleeding is much greater than that for chronic bleeding. The clinical presentation reflects the site, aetiology and rate of bleeding and may manifest in one or more ways. Hematemesis, melena and haematochezia are the most common manifestations. The bleeding may be obscure in about 5% of cases and at times may manifest as an occult bleed. Peptic ulcers are the most common causes of upper GI bleeding and are followed by variceal bleeding, gastric and duodenal erosive disease and Mallory-Weiss tears in prevalence. The associated factors include *H. pylori* infection, NSAID intake and alcohol abuse. Many guidelines recommend long-term use of aspirin for prevention of cardiovascular events among patients with prior cardiovascular disease or multiple risk

factors. However, aspirin is associated with increased risk of major gastrointestinal bleeding A recent meta-analysis found an approximately two-fold higher risk of gastrointestinal bleeding among individuals regularly using aspirin compared to placebo.[1]

An initial hemodynamic assessment helps to plan resuscitation, forms the basis of further management and also predicts the prognosis of the patient. Early upper gastrointestinal endoscopy, defined as within 24 hours of hospital presentation or admission is the cornerstone of management of UGIB. A number of scoring systems have been designed to ascertain risk factors for poor outcome and to improve patient management and promote cost-effective use of hospital resources in patients with UGIB. Rockall et al. developed a risk-scoring system involving clinical and endoscopic criteria to predict the risk of rebleeding and mortality in patients with UGIB. It is based on age, presence of shock, co-morbidity, diagnosis and endoscopic stigmata of recent haemorrhage. Multiple studies have validated the Rockall score's ability to identify and risk-stratify patients with UGIB. The Rockall system has been shown to represent an accurate and valid predictor of rebleeding and death. This has the potential to result in a more appropriate management of subjects' conditions based on their assessed risk of complications following the initial UGI bleed.[2]

Aim and objectives

Aim and objectives of current study were to study endoscopic findings and determining the outcomes (mortality and rebleeding) in patients presenting with upper gastrointestinal bleed in our institute and to determine the outcome in patients with Upper GI Bleed who are on blood thinners.

METHODS

Study design, location, duration and sample size

A Prospective cohort study is done where all patients presented with UGI bleed are considered. The period of study was of 6 months from June 2021 to December 2021. A total of 56 patients were taken into consideration from Shree Krishna Hospital, Bhaikaka University, Karamsad, Anand district, Gujarat, India.

Procedure

All the patients were first evaluated and investigated. Clinical examination was done. The patient who was in shock, were first stabilized with appropriate management like iv fluids and blood products transfusion and routine blood investigation like CBC, Electrolyte, ABG, LFT etc. Imaging studies like USG A+P, Chest X-ray and CT scan were done as per the requirement of the patient. Patient were admitted in the ICU with RT insertion and gastric lavage and aspiration was done. Once the patient was stable, Upper GI Scopy was done for diagnostic and therapeutic intent. This helped us in determining the Rock All score of the patient and helped us in assessing the outcome based on the score.

Inclusion criteria

Inclusion criteria for current study were; patients with upper GI bleed (hematemesis, melena, hematochezia), The patients who fulfilled the above-mentioned criteria and did not have any contraindications for endoscopy and were willing for undergoing upper GI endoscopy will be enrolled in study.

Exclusion criteria

Exclusion criteria for current study were; comatose patients, patients with stage 3 and 4 hepatic encephalopathy, perforated viscus and those who didn't gave consent for UGI scopy.

Study variables

All patients who met the above criteria were included in the study The following were noted in each patient; Age, Gender, Presentation- hematemesis, melena, haematochezia and Severity of bleed-minor, moderate or massive, minor bleed-no hemodynamic instability, <10% blood loss, Moderate bleed postural hypotension and orthostatic tachycardia, 10-20% intravascular volume loss, massive bleed-shock (resting hypotension)-20-25% intravascular volume loss. Associated factors; Alcohol use, smoking, use of non-steroidal anti-inflammatory drugs (NSAID), corrosive ingestion and past history of upper GI bleed, Comorbid conditions: ischemic heart disease, congestive cardiac failure, renal failure, liver disease, disseminated malignancy. Physical examination and documentation of tachycardia and hypotension and the clinical diagnosis Requirement for blood transfusion.

Endoscopy

Upper GI endoscopy was performed in all patients, findings documented and requirement and mode of endoscopic therapy to control bleeding in indicated cases, noted. Varices were classified by the classification proposed by Sarin et al. The grading of oesophageal varices was taken as follows: small and straight (grade I); tortuous and occupying less than one third of the oesophageal lumen (grade II); or large and occupying more than one third of the oesophageal lumen (grade III). Rockall score was calculated in all patients based on the following criteria Age, Shock (assessed from pulse rate and blood pressure), Comorbid conditions (cardiac, renal, liver, others), Endoscopic stigmata of recent bleed, Endoscopic diagnosis. On summing up different levels of a point grading system, scores ranging from 0 to 11 were obtained. Rebleed was defined as fresh hematemesis or melena associated with the development of shock or a fall in haemoglobin concentration of at least 2 g/dl in 2 hours. The rebleed, requirement of blood transfusions and

mortality were documented and the efficacy of Rockall score as a predictor of rebleed was analysed. The concordance between the initial clinical diagnosis and endoscopic findings were recorded. Statistical analysis - Fisher's exact test as appropriate were used for comparison between groups. A P value of 0.05 or less was regarded as significant.

RESULTS

Total 36 males participated in the study which constitutes 64.2% of the study population and females were 20 which constitutes 35.7% of study population. Total 56 patients were grouped into categories according to their age with each category having an age interval of 20 years.

Table 1: Severity of bleed.

Severity				
Age	**Minor**	**Moderate**	**Severe**	**N (%)**
20-39	4	4	2	10 (17.8)
40-59	12	8	4	24 (42.8)
60-79	9	9	3	21 (37.5)
>80			1	1 (1.7)
Total	25 (44.6)	21 (37.5)	10 (17.8)	56

Table 2: Associated factors.

Associate factors				
Age	**None**	**Alcohol**	**NSAID**	**N (%)**
20-39	4	5	1	10 (17.8)
40-59	6	17	1	24 (42.8)
60-79	13	5	3	21 (37.5)
>80		1		1 (1.7)
Total	23 (41)	28 (50)	5 (8.9)	56

Total number of patients in the age category of 40-59 were 24 which constitutes 42.8% of the total study population. This constitutes majority of the study group and hence the mean group of the patient is 50 years. The second highest patients belonged to the age group of 60-79, 21 patients and they constitute 37.5% of the study population. Total 34 presented hematemesis in the study which constitutes 60.7% of the study population. The second most common mode of presentation is hametemesis+melena that is 12, which constitutes 21.4% of the study population. The third most common mode of presentation is melena that is 6, which constitutes 10.7% of the study population.

The majority of patients presented with minor bleed that is 25, which constitutes (44.6%) of the study population. 21 patients presented with moderate bleed which constitutes (37.5%) of the study population. Only 10 patients presented with severe bleed (17.8%). The associated factors with UGIB are depicted in (Table 2). The majority of patients with UGIB had alcohol as most associated factors (50%). NSAID (23) was the second most associated factors (41%). In the study population of 56 patients, around 44 patients (75%) had comorbidity out of which; 18 of them (32.1% of population) had liver disease which contributed to the UGIB. Other comorbidities included COPD, diabetes mellitus and systemic hypertension; which contributed 11 (19.6%) of population. Around 4 patients (7.1%) had cardiac problems like ischemic heart disease and congestive cardiac failure. 43 patients (76.7%) were subjected to Upper GI endoscopy to ascertain cause of bleed within 24 hours (early) and 13 (27.8%) were subjected after 24 hours (late).

Endoscopic findings

Variceal causes predominated and was the most common sources of bleed in all age categories. Varices (45) which is (80.3%) is the most common cause of UGIB. Non variceal causes (11) are second most common cause of UGIB (19.6%). The various cause of non-variceal bleeding in the patients. Esophageal ulcer and gastritis were found in 2 patients respectively. While Dieulofoy's lesion, duodenal ulcer, mallory weis tear, gastric ulcer was found in 1 patient each. One patient had had more than one lesion that is duodenitis and gastric ulcer.

Table 3: Comorbidity.

Comorbidities						
Sex	**None**	**Cardiac**	**Liver**	**Others**	**Liver + others**	**Grand total N (%)**
Male	10	3	13	5	5	36 (64.2)
Female	4	1	5	6	4	20 (35.7)
Grand total N (%)	14 (25)	4 (7.1)	18 (32.1)	11 (19.6)	9 (16)	56

It shows various grade of varices. Grade 3 shows 23 cases which accounts for (52.2%) of whole study. Grade 2 varices are present in 14 patients (31.8%) and grade 1 varices are present in 7 patients (15.9%). The mean Rockall score was calculated in all patients based on age, hemodynamic status, comorbidity, endoscopic diagnosis and SRH. The patients were classified into three groups, based on Rockall Score. Those with a score less than 3, into group A (low risk), score of 3-5 into group B (moderate risk) and those with a score of 6 or more into group C (high risk). Most patients were observed to belong to the moderate group 25 which contributed 44.6% of the

study population and 23 belonged to severe group which contributed 41.07% of the whole study.

Table 4: Rockall score distribution.

Rockall Score	N (%)
1	4 (7.14)
2	4 (7.14)
3	7 (12.5)
4	12 (21.4)
5	6 (10.7)
6	11 (19.6)
7	7 (12.5)
8	3 (5.3)
9	2 (3.5)
Grand total	56

The majority of patients with UGIB belonged to 40-59 years of age group followed by 60-79 years of age group. Variceal bleed was observed to be equal in both moderate and high-risk groups. It was higher significantly compared to the low-risk group.

Table 5: Risk group-age distribution.

Risk group (years)				
Age	**A**	**B**	**C**	**N (%)**
20-39	2	3	5	10 (17.8)
40-59	4	11	9	24 (42.8)
60-79	2	11	8	21 (37.5)
>80			1	1 (1.7)
Total	8 (14.2)	25 (44.6)	23 (41.07)	56

Table 6: Rockall score risk group and cause of bleed.

Cause	Low (A)	Moderate (B)	Severe (C)	Grand total, N (%)
Varices	3	21	21	45 (80.3)
Non variceal	5	4	2	11 (19.6)
Grand total	8 (14.2)	25 (44.6)	23 (41.07	56

Table 7: Risk groups based on Rockall Score.

Risk	RUGBE N (%)	Rockall et al N (%)	Present study N (%)
Low	240 (13)	1058 (45.4)	8 (14.2)
Moderate	999 (53)	1181 (50.7)	25 (44.6)
High	630 (34)	93 (3.9)	23 (41.07)
Total	1869	2332	56

The need for packed red cell transfusion and the number of patients who had rebleed were noted, along with mortality. The requirement of blood transfusion and incidence of rebleed was more in moderate and high-risk groups. The incidence of rebleed were in more in high-risk group compared to other groups. Mortality was only seen only in high-risk group.

Table 7: Risk groups based on Rockall Score.

Risk	RUGBE N (%)	Rockall et al N (%)	Present study N (%)
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Moderate	999 (53)	1181 (50.7)	25 (44.6)
High	630 (34)	93 (3.9)	23 (41.07)
Total	1869	2332	56

Table 8: Rockall score and outcome.

Variable	Risk group			No of cases
	Low risk (A)	**Moderate risk (B)**	**High risk (C)**	
PRBC (packed red blood cells)	1	18	22	41
Rebleed	1	5	20	26
Mortality	0	0	2	2

Table 9: Risk groups and outcome: comparison.

Parameters	low vs. mod risk (P value)	low vs. high risk (P value)
PRBC (packed red blood cells)	<0.05	<0.05
Rebleed	>0.05	<0.05
Mortality	<0.05	0.544

Comparison of various modalities in various risk groups is depicted in results. The requirement of blood transfusion was significantly higher in the moderate and high-risk groups as compared to the low-risk groups, (both p values less than 0.05). The incidence of rebleed which was less in the moderate risk group (p value >0.05) and the incidence of rebleed was more in high risks group (p value <0.05). There was no mortality in the moderate and low risk groups. There were 2 deaths in the third group statistically significant as compared to the low-risk group and moderate risk group (p value= 0.544). All of the 56 patients underwent endotherapy. Out of which 41 patients were treated with EVL, 3 patients received EST and only 2 patients were treated with injection therapy with adrenaline. It was noted that out of the 56 cases 26 patients had rebleed. The rebleed was found to be only in variceal causes. No rebleed was found in non-variceal causes. All of the 26 patients who had rebleed, received endotherapy for the same. All the patients were treated with either EVL or EST or Adrenaline injected locally to control bleeding.

DISCUSSION

The clinical and endoscopic profile of the four hundred and six patients presenting to the endoscopy unit of the

institution were analysed. Age, gender, severity of bleed, mode of presentation, etiology and associated factors were documented, along with the documentation of Rockall score, requirement of blood transfusions, rebleed and endotherapy instituted. The Rockall score has been validated by several studies, for predicting rebleed and mortality. In this study, along with the determination of the Rockall score, the subjects were divided into three risk groups. The available data is compared with contemporary literature and utility of Rockall score in risk stratification, is evaluated.

Age distribution

The mean age was 53.1 years with an age range of 20-82 years. It was lower than that observed in the RUGBE (Canadian Registry on Upper Gastrointestinal Bleeding and Endoscopy Database of 1869 patients) study by Barkun et al, Rockall and Logan et al and Yavorski et al.[2-4] The majority of patients in the present study fell into the age group of 40-59 years -24 (42.8%). Only 1 subject (1.7%) was above 80 years, as compared to 634 (27.2%) noted by Rockall et al, who concluded that the incidence of bleed significantly increased with age. Longstreth and colleagues, in their series, noted that 47% of their patients were above 60 years of age, as compared to the present study where it was noted to be only 39.2%.[5]

Gender distribution

Male predilection (64.2%) was noted in this study, in concordance with the RUGBE database, where 62% were males and that noted by Rockall et al. (57% males). Longstreth et al also had noted a male predilection of 67.9%.[5]

Presentation

Majority of patients patients-34 (60.7%) had hematemesis as a presenting feature and 6 (10.7%) had melena, as compared to RUGBE data where hematemesis was noted in 58% of patients and melena in 69%, and that observed by Longstreth et al who noted that 33% of their patients had hematemesis and 81% had melena.[5] Hematochezia was noted in 12 (21.4%), which was higher than that noted by Barkun et al (15%) and Laine et al (5%).[2]

Associated factors

Longstreth et al noted history of NSAID (aspirin) use in 53% and alcohol use in 3% of patients in their series. The present study noted a much higher percentage of patients with alcohol use- 28 (50%), though NSAID (aspirin) use was noted only in 5(8.9%) of patients.[5]

Timing of endoscopy

Chak et al observed that early endoscopy was done in 82% of their patients.[6] Rockall et al noted that 1108 (50.1%) patients underwent early endoscopy which was comparable to that noted in the present study 43 (76.7%).[3]

Causes of upper GI bleed

Barkun et al noted in the RUGBE study, that 56% had peptic ulcer disease as the primary etiology for UGI bleeding, followed by esophagitis (8.4%), Mallory Weiss tears (4.4%) and Dieulafoy lesions (2.5%).[2] In the present study, 11 patients had non variceal causes of bleed, of which peptic ulcers accounted for 1 (1.7%). 1 (1.7%) had duodenal ulcers and 2 (3.5%) had gastric ulcers. Gastritis-2 (3.5%) and duodenitis 1 (1.7%) were seen, with oesophageal ulcer seen in 2 (3.5%), much were much less than that noted by Barkun et al, Mallory Weiss tears accounted for 1 (1.7%) case.[2] In the present study variceal cause predominated in causing UGIB than non-variceal causes in all the age groups, but it was found more significantly higher in patients less than 60 years of age than >60 years of age. Varices were observed in a much lower percentage by Rockall et al. and Vreeburg (4.6% and 9% respectively), in comparison with this study (80.3%).

Endotherapy

Endotherapy was done in all 56 (100%) cases in the present study. Adrenaline injection was performed in just 2 case, Endoscopic sclerotherapy was done in just 3 case and in majority of patients endoscopic variceal ligation (41) was done. Vreeburg et al in their series, noted lower endoscopic intervention rates, with 21% of patients with UGIB in their case series undergoing endotherapy.[7]

Rockall Score

The mean Rockall score was 4.8 in the RUGBE study whereas in the present study, it was mean score: 4.7 indicating that most patients belonged to the moderate risk category. As compared to the RUGBE study where the majority belonged to the moderate and high-risk group, in the present study, here in present study also most of the patients had a high Rockall score (more than 3) and belonged to the moderate risk group. However, the percentage of patients belonging to the high risk group, in the present study, was higher than that noted by Rockall et al (41.07% vs. 3.9%) as patients in high risk group had more of esophageal varices than gastric varices.[2] The comorbidities were higher in the present study (60.17%) as compared to that noted by Rockall et al (59.1%) and Yavorski et al (50.9%) and hemodynamic instability was also higher (25%) than that noted by Rockall et al (11.2%) as patients were mostly alcoholic and had chronic liver parenchymal disease.[2]

Adverse outcome

In the present study, the requirement of blood transfusion was significantly higher in the moderate and high-risk groups as compared to the low-risk groups, (both p values less than 0.05), as was the incidence of rebleed which was

more in the moderate and high-risk groups as against the low-risk group. These findings are compared to that observed by Patel et al. In comparison with the observations of Patel et al, the need for packed red cell transfusions were less in all groups in the present study. But, the percentage of rebleed, was higher than that noted by Patel et al, as far as the high-risk groups were concerned. Akash et al, in their study of upper GI bleed, from a tertiary care institution at Chennai, also noted that Rockall score correlated well with the need for blood transfusions, rebleeding and mortality.[8] In the present study, the rebleed rate in moderate risk group was 19.2% and slightly lower than that noted by Akash et al (21.4%) but the rate of rebleed in the high risk group was higher.[8] The following table gives a comparison of the rebleed noted in the RUGBE11 study and present study. It was noted that in the low-risk group, the rebleed was lower in the present study (3.8%) as compared to RUGBE data, where 8.8% rebleed and that noted by Rockall et al. 41 where 4.3% had rebleed. But it was observed that in the high-risk group, 76.9% of patients had rebleed which was higher than the rate of 17% noted in the RUGBE data.

The present study shows that the risk of rebleed in patients on NSAID (aspirin) was nil and there was no mortality associated with it and they were easily managed by endotherapy. The incidence of mortality was nil in low and moderate risks groups. Only 2 mortality was noted in high-risk groups.

CONCLUSION

Upper GI bleed is an important indication for endoscopic referral to this institute. The majority of the patients were noted to be below 60 years of age with a male predilection. Most of the cases presented with moderate or severe upper Gi bleed with minor bleeds constituting a minority. NSAID and alcohol as well as smoking were the notable associated factors in patients with UGIB. Blood thinners also result in UGIB but the severity of bleed is mild and prognosis of the patients is good and patients are at less risk of rebled and mortality. Variceal bleed was the most common cause of UGIB presenting with grade II and III varices. It was predominated in middle age group with more male predominant. Non variceal bleed were distributed in all age group and different cause of non-variceal bleed like oesophageal ulcer, peptic ulcer, duodenal ulcer, Mallory wies tear, duodenitis were identified using endoscopic corelation. Based on Rockall score, most of the case fell into moderate and severe risk groups (score between 3-11). In the moderate group the patients with variceal bleed were higher compared to both high and low risk group. The rebleed was significantly higher in patients with variceal bleed than that of non-variceal bleed. The requirement of packed red blood cell transfusion and rebleed were higher in patients with higher Rockall score (moderate and high-risk groups). The mortality was significantly high in the high-risk group compared to the low and moderate risk group in which there were no mortality. Hence, Rockall score has been found to correlate well with clinical outcome, including need for transfusions, rebleeding and mortality, and may be used for effective triage of patients into outpatient and inpatient care, as well as to predict prognosis in upper GI bleed.

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