# UPPER GI HEMORRHAGE;
## TO PREDICT THE FREQUENCY OF REBLEEDING BY PRE-ENDOSCOPIC CLINICAL ROCKALL SCORING SYSTEM IN PATIENTS

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**ABSTRACT… Objectives:** To predict the frequency of rebleeding by pre-endoscopic clinical Rockall scoring system in patients presenting with upper gastrointestinal hemorrhage. **Study Design:** Descriptive Case series study. **Period:** six months. **Settings:** Departments of Medicine, Liaquat University of Medical and Health sciences Jamshoro/Hyderabad. **Material & Methods:** The source of data was 187 patients who reported with the presenting complaint of hematemesis in ER and were then transferred to Medical Unit for further management. At the time of inclusion the concerned Physician collected the demographic data, vital and relevant information for the presence of co morbidities. After admission patients were shifted to endoscopy suite (situated in Medical Unit) for the endoscopic diagnosis of the underlying condition. Any new episode of hematemesis was considered as a re-bleed (within 120 hours of time zero). Rockall scoring was calculated as per operational definition in the specifically designed proforma for the study. Mortality was noticed in the time the patient stayed in the hospital. Rebleeding was the end point of this study. **Results:** A total of 187 patients were selected for this study. Out of these 119 were males (63.64%) and 68 (36.36%) were females. The mean age of patients was 59.25 years ± 10.3 SD. Mean systolic BP was 107.08 ± 13.3, heart rate was 90.3 ± 11.9 and clinical Rockall score of 3.5 ± 0.8 SD. A total of 111 (59.4%) patients presented with bleeding esophageal varices, 36 (19.3%) presented with bleeding gastric varices, together chronic liver disease was responsible for 78.4% (147) of patients. Gastric erosions were seen to be the cause of upper gastrointestinal hemorrhage in 18 (9.6%) of patients, whereas peptic ulcer disease was the cause responsible in 20 (10.7%). Lastly gastric carcinoma was seen in only 2 (1.1%) of patients. A total of 35 (18.7%) of patients experienced rebleeding episodes during the hospital stay. Mortality was seen in 31 patients (16.6%). **Conclusion:** Clinical Rockall score is a good predictor of rebleeding and mortality. However, application of this score for the purpose of triage of patients reporting with bleeding esophageal varices is problematic because this group has the presentation of liver failure along with hematemesis so getting low Rockall scores (and predicting survival without endoscopic intervention) is not possible in this group of patients.

**Key words:** Hematemesis – Rockall score – rebleed – mortality.

## INTRODUCTION
Acute upper gastrointestinal haemorrhage (bleeding proximal to the duodenojejunal flexure) is a common medical emergency (170 per 100 000 adults annually). Although its incidence may be declining, the mortality rate of upper gastrointestinal haemorrhage remains high, approximately 6–8%.[1] The prevalence of uncomplicated peptic ulcer has fallen in the West over the past two decades, yet the incidence of peptic ulcer bleeding and perforation has been stable or rising.[2] Many patients who present to a hospital with peptic ulcer bleeding are elderly and have significant medical comorbidities, which place them at risk of death. Mortality after hospital admission for acute upper-GI bleeding is approximately 10% in the United Kingdom, while that for patients who bleed while hospitalized for other medical or surgical disorders is much higher.[3] It is essential that patients at high risk of dying are identified at an early stage of their hospital stay so that they can be intensively managed. Such patients require circulatory support and management of comorbidity, and

those with major stigmata of hemorrhage[4] undergo endoscopic therapy, which has been shown to reduce the predicted and observed rates of recurrent bleeding and mortality in each score group) and discrimination (the ability of the system to determine which patients would experience recurrent bleeding or die and which would not). Vreeburg et al[5] concluded that the Rockall system was clinically useful for the prediction of mortality but not recurrent bleeding. In their series, Rockall et al[6] and Vreeburg et al[5] examined the outcomes in unselected patients who presented with GI hemorrhage. Deaths were almost entirely restricted to elderly patients who had significant comorbidities and major stigmata of hemorrhage. Nicholas et al.[7] conducted a study with aim to define the utility of the Rockall scoring system in ''high-risk'' patients with major peptic ulcer hemorrhage who underwent endoscopic therapy.

The study done by Nicholas et al.[7] concluded that after endoscopic therapy, higher Rockall scores correlate significantly with recurrent bleeding and 30-day mortality. The results of the study done by Nicholas et al closely mirror Vreeburg's results and show that, although the calibration of the scoring system may be changed after endoscopic therapy in patients with high risk ulcer bleeding, the discriminative ability remains good for the prediction of mortality and poor for the prediction of recurrent bleeding. But their results differ from those published by Sanders et al.[8] Triage of patients with GI bleeding into high- and low risk groups enables more cost-effective use of medical resources and should improve outcome for patients. This approach had previously been given a grade A recommendation.[9] To date, most attention has focused on the use of scoring systems to facilitate early discharge of low-risk patients. In this regard, the Rockall system has been found to be superior to other scoring systems for the identification of such patients.[10,11]

## OBJECTIVES
The objective of the above study is to predict the frequency of rebleeding by pre-endoscopic clinical Rockall scoring system in patients presenting with upper gastrointestinal hemorrhage.

## Setting
All medical units of Liaquat University Hospital Jamshoro and Hyderabad.

## Duration of Study
11th January 2011 to 10th July 2011 (six months).

## Sample Size
The frequency of rebleeding predicted by Rockall Score of 4 points is 14.1%.[8] with 95% confidence interval and 5% margin of error, a total of 187 patients should be selected.

## Sampling Technique
Non probability purposive sampling.

## Sample Selection

## Inclusion Criteria
1. All patients who present with Upper gastrointestinal hemorrhage (regardless of cause).
2. Patients aged 15 and above (lower age group would report to Pediatrics ward).

## Exclusion Criteria
1. Patients taking anticoagulants (these patients have no structural abnormality on endoscopy, so should be excluded)
2. Patients bleeding from multiple sites. (Usually have hematological cause for bleeding, therefore excluded).

## Study Design
Descriptive Case series study

## Data Collection
As this would be a case series study so it does not involve any ethical issues, however, approval was sought from ethical review committee of the teaching university for the study.

The source of data was patients who reported with the presenting complaint of hematemesis in ER and were then transferred to Medical Unit for further management. Informed consent was taken from all patients (or next of kin in case patient was unconscious). At the time of inclusion the concerned physician (who was

unaware regarding the specific objectives of the study, and would have at least 5 year experience of evaluating and managing such cases on a routine basis) collected the demographic data, vital signs (Pulse rate, blood pressure via mercury sphygmomanometer) and relevant information for the presence of comorbidities (ischemic heart disease, cardiac failure, hepatic failure, renal failure). After admission patients would be shifted to endoscopy suite (situated in Medical Unit) for the endoscopic diagnosis of the underlying condition. Any new episode of hematemesis was considered as a re-bleed (within 120 hours of time zero, as described already). Rockall scoring was calculated as per operational definition in the specifically designed proforma for the study. Mortality was noticed in the time the patient stayed in the hospital. Rebleeding was the end point of this study.

## Data Analysis
Statistical package for social sciences (SPSS™) version 18 was used for data processing purpose. Means ± SD was calculated for quantitative variables like age, pulse rate, systolic blood pressure, Rockall score. Frequencies and percentages were calculated for qualitative variables like gender, hematemesis, melena, rebleeding and mortality. Age, gender were evaluated for confounding effect by stratification.

## RESULTS
A total of 187 patients were selected for this study. Out of these 119 were males (63.64%) and 68 (36.36%) were females. The male to female ratio M: F was 1.75:1. The mean age of patients was 59.25 years ± 10.3 SD. Mean systolic BP was 107.08 ± 13.3, heart rate was 90.3 ± 11.9 and clinical Rockall score of 3.5 ± 0.8 SD. These quantitative variables are presented as Table-I.

|  | Mean | Std. Deviation |
|---|---|---|
| Age (in years) | 59.25 | 10.389 |
| Systolic Blood Pressure | 107.08 | 13.380 |
| Pulse Rate | 90.36 | 11.991 |
| Rockall Score | 3.52 | 0.845 |

**Table-I. Descriptive Statistics of continuous variables**

The patients were sub-divided into three age related categories. The first category contained patients aged 15-59 years (111, 59.4%), second 60-79 year old patients (57, 30.5%), whereas the third category contained patients ≥ 80 years (19, 10.2%) respectively.

The systolic blood pressure (SBP) was categorized in two groups ≥100 mmHg and <100 mmHg respectively. A total of 155 (82.89%) patients had a SBP of ≥100 mmHg, wheras 32 (17.11%) patients had a SBP of <100 mmHg.

The pulse rate, similarly was divided in <100 beats/min and ≥100 beats/min. A total of 154 patients (82.35%) were having a pulse rate of <100 beats/min and 33 (17.65%) had a pulse rate of ≥100 beats/min.

A total of 146 (78.07%) patients presented to the ER with the complaint of hematemesis. Only 26 out of 187 patients (13.9%) presented with melena.

An overwhelming majority of 166 patients (88.8%) were suffering from disseminated malignancy / renal / liver failure, whereas ischemic heart disease was present in 4 (2.1%) of patients. Only 17 (9.1%) patients had no co-morbid condition.

Figure-1 show the distribution of subsets of clinical Rockall Score. Six (3.2%) patients had a score of 1, only four (2.1%) patients had a score of 2, 85 patients (45.5%) had a score of 3, 71 (38%) had a score of 4 and 21 (11.2%) had a score of 5.
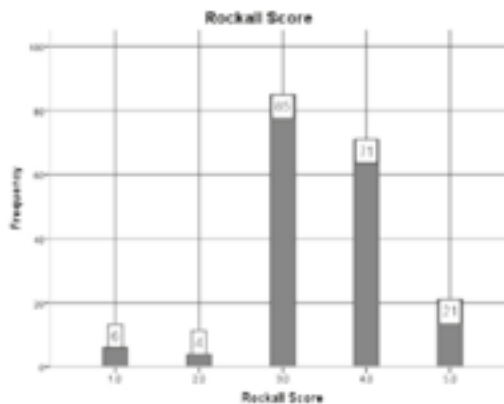


**Figure-1**

Figure-2 show the etiology of upper GI endoscopy (determined after calculation of clinical Rockall score). A total of 111 (59.4%) patients presented with bleeding esophageal varices, 36 (19.3%) presented with bleeding gastric varices, together chronic liver disease was responsible for 78.4% (147) of patients. Gastric erosions were seen to be the cause of upper gastrointestinal hemorrhage in 18 (9.6%) of patients, whereas peptic ulcer disease was the cause responsible in 20 (10.7%). Lastly gastric carcinoma was seen in only 2 (1.1%) of patients.
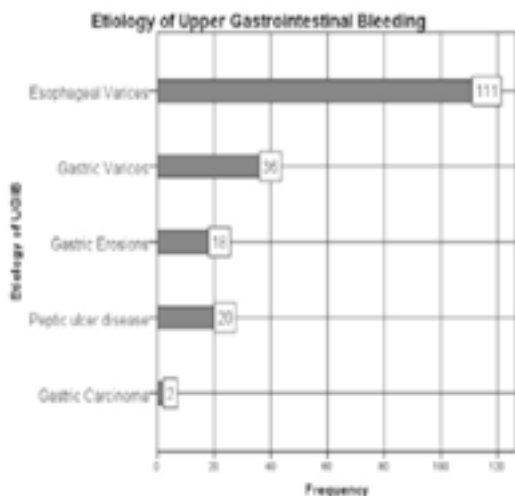
A total of 35 (18.7%) of patients experienced re-bleeding episodes during the hospital stay. Consequently, mortality was seen in 31 patients (16.6%).

One out of six patients (16.6%) didn't survive who had a Rockall score of 1. One out of four (25%) patients was non survivor in Rockall score category 2. 11 out of 85 (12.9%) patients didn't survived the hospital stay with a Rockall score of 3, whereas 12 out of 71 (16.9%) died with a Rockall score of 4. Lastly 11 out of 21 (52.38%) patients died within the hospital stay with a Rockall score of 5. Figure-3 show the proportion of rebleeding with different Rockall score categories.
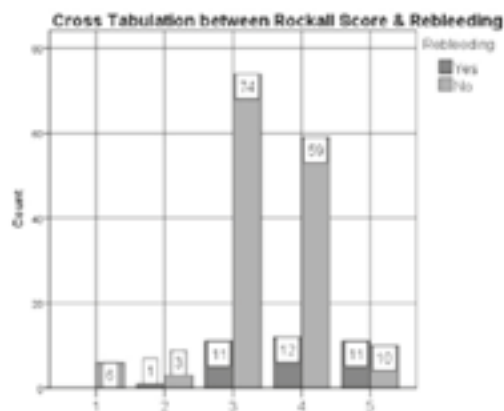


**Figure-2**



**Figure-3**

| | | Age groups | | | Total |
|---|---|---|---|---|---|
| | | 15-59 Years | 60-79 Years | =>80 Years | |
| Rockall Score | 1 | 6 | 0 | 0 | 6 |
| | 2 | 0 | 3 | 1 | 4 |
| | 3 | 68 | 13 | 4 | 85 |
| | 4 | 30 | 41 | 0 | 71 |
| | 5 | 7 | 0 | 14 | 21 |
| Total | | 111 | 57 | 19 | 187 |
| Table-II. Rockall Score * Age groups Cross tabulation | | | | | |

## DISCUSSION

A total of 187 patients were selected for this study. The mean age of patients was 59.25 years ± 10.3 SD. Mean systolic BP was 107.08 ± 13.3, heart rate was 90.3 ± 11.9 and clinical Rockall score of 3.5 ± 0.8 SD. Out of these 119 were males (63.64%) and 68 (36.36%) were females. The male to female ratio M: F was 1.75:1. These findings are in agreement with a study done by Romagnuolo J et al in 2007.[12] They reported the mean age as 66 (±20 SD).[12] in that study 62.3% were males and M: F ratio was 1.65:1, which is very near to the result of my study.

The patients were sub-divided into three age related categories. The first category contained

patients aged 15-59 years (111, 59.4%), second 60-79 year old patients (57, 30.5%), whereas the third category contained patients ≥ 80 years (19, 10.2%) respectively. These results are similar to the ones reported by Morales Uribe et al in 2007, this publication reports the percentages in these three age categories as 49.8%, 34.7%, and 15.5% respectively.[13] There are more patients in the first category (age 15-59 years) in my study probably because of different etiology (bleeding esophageal varices) pattern in my study.

The systolic blood pressure (SBP) was categorized in two groups ≥100 mmHg and <100 mmHg respectively. A total of 155 (82.89%) patients had a SBP of ≥100 mmHg, where as 32 (17.11%) patients had a SBP of <100 mmHg, i.e., they were in shock at the time of presentation. Morales Uribe et al also report that 13.8% of their study population was in shock at the time of presentation.[13] The apparent increase in the percentage of patients with shock in my study is probably because of underlying etiology of bleeding esophageal varices because these patients have more chances of being in shock at the time of presentation, have a worse co-morbidity profile than their compatriots, and therefore have a worse prognosis consequent to these complications. Similar data is presented recently by Lahiff C et al who report that the variceal group has more comorbidities, lower haemoglobin and lower systolic blood pressure at presentation. As a result these study patients had higher risk scores and worse clinical outcomes (rebleeding P=0.004).[14]

A total of 111 (59.4%) patients presented with bleeding esophageal varices, 36 (19.3%) presented with bleeding gastric varices, together chronic liver disease was responsible for 78.4% (147) of patients. Gastric erosions were seen to be the cause of upper gastrointestinal hemorrhage in 18 (9.6%) of patients, whereas peptic ulcer disease was the cause responsible in 20 (10.7%). Lastly gastric carcinoma was seen in only 2 (1.1%) of patients. In a landmark study, which had a total of 5810 patients, Rockall TA[15] reported that the majority of the patients presenting with upper gastrointestinal bleeding were having the underlying diagnosis of peptic ulcer disease (35.31%), followed by no diagnosis (23.99%), gastric erosions (10.79%), esophagitis (612%), Mallory Weis syndrome (5.38%), bleeding esophageal / gastric varices (4.51%), gastric malignancy (3.88%) and other diagnoses at 5.61%. This study was reported from United Kingdom.

Morales Uribe et al[13] reported the etiology of upper gastrointestinal hemorrhage as follows: peptic ulcer disease (41%), malignancy 3.0%, varices 10.1%, Mallory Weis tear 3.9%, gastric erosions at 34.9%, hypertensive gastropathy 4.3% and others 1.3% respectively.[13] This study was done from Latin America.

It can be easily surmised from my study (Pakistan), Rockall TA (United Kingdom) [15] and Morales Uribe [13] (Latin America) that etiological causes are not uniform in any of these three studies. In Pakistan bleeding esophageal varices are the most common mode of presentation when a patient reports with hematemesis, whereas peptic ulcer disease is the commonest presentation worldwide.

A total of 35 (18.7%) of patients experienced re-bleeding episodes during the hospital stay. A rebleeding rate of 12.9% was reported by Lee JY et al from Korea.[16] Rockall LA and Morales Uribe[13] report a rebleeding rate of around 10%. The rebleeding rate was marginally higher in my study probably because of the etiological factor.

In my study mortality was seen in 31 patients (16.6%). Since the past few decades the mortality of upper gastrointestinal tract bleeding has reduced significantly, but the rates are around 8-14% in the international literature.[17-20]

The mortality rate reported by Morales Uribe CH et was also within this range (9.5%).[13] In my study the mortality rate was slightly raised probably because majority of this study population consisted of patients with bleeding esophageal / gastric varices which carries a worse prognosis and better healthcare delivery systems which exist in the advanced countries of the world.

In my study the Rockall score of the patients ranged from 1 to 5. One out of six patients (16.6%) didn't survive who had a Rockall score of 1. One out of four (25%) patients was non survivor in Rockall score category 2. 11 out of 85 (12.9%) patients didn't survived the hospital stay with a Rockall score of 3, whereas 12 out of 71 (16.9%) died with a Rockall score of 4. Lastly 11 out of 21 (52.38%) patients died within the hospital stay with a Rockall score of 5. Chart No: 3 show the proportion of rebleeding with different Rockall score categories. These values are comparable with Rockall LA, Morales Uribe and Lee et al.[13-16]

## CONCLUSION

Clinical Rockall score is a good predictor of rebleeding and mortality. However, application of this score for the purpose of triage of patients reporting with bleeding esophageal varices is problematic because this group has the presentation of liver failure along with hematemesis so getting low Rockall scores (and predicting survival without endoscopic intervention) is not possible in this group of patients.

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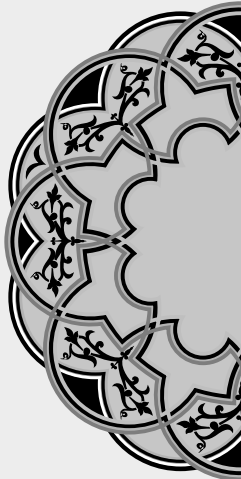
*"Making mistakes is better than faking perfection."*

**Unknown**

## AUTHORSHIP AND CONTRIBUTION DECLARATION

| Sr. # | Author-s Full Name | Contribution to the paper | Author=s Signature |
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| 1 | Sanam Panhwar | Protocol writing study concept and design data collection and analysis manuscript writing. | |
| 2 | Muhammad Aslam Rind | Protocol writing study concept and design, Data collection , Data analysis, Manuscript writing and review. | |
| 3 | Maria Nazir Khyber | Protocol writing, Study concept and design, Data collection and analysis, manuscript writing and reivew. | |