# ROLE OF AIMS65 SCORE IN DETERMINING FREQUENCY OF MORTALITY IN PATIENTS WITH UPPER GASTROINTESTINAL BLEED

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## ABSTRACT

***Objective:*** To determine the frequency of mortality in upper gastrointestinal bleed patients having AIMS65 score >3.

***Study Design:*** Descriptive case series study.

***Place and Duration of Study:*** Department of Accident and Emergency and the Department of Medicine, Combined Military Hospital Quetta, from Sep 2015 to Sep 2016.

***Material and Methods:*** All patients having AIMS65 score>3 with UGIB, defined by the presence of hematemesis, melena or hematochezia, and/or a positive N/G tube aspiration for coffee ground, black or bloody contents were enrolled. Information on clinical factors was collected by taking a history and conducting an examination. Blood pressure was recorded manually by mercury sphygmomanometer. Blood samples of patients were collected for serum Albumin and international normalized ratio (INR). Laboratory investigations were sent to hospital laboratory which was headed by classified pathologist. AIMS65 mortality score of UGIB was calculated. Each risk factor (variable) carries one point. Thirty days mortality was calculated in patients with AIMS65 score>3. If the patients had been discharged before the time then outcome was determined through telephone communication.

***Results:*** Mean age of the patients was 57.69 ± 16.68 years. There were 51 (32.7%) females and 105 (67.3%) males. Alteration in mental status was observed in 131 (84%) patients. Mortality was observed in 19 (12.2%) patients.

***Conclusion:*** The mortality from upper gastrointestinal bleed increased with increasing AIMS score.

**Keywords:** Albumin, Duodenal ulcer, International normalized ratio, Portal hypertension, Upper gastrointestinal bleed.



## INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a common gastrointestinal emergency and carries a mortality rate of 10-14%. UGIB is defined as bleeding resulting from a source proximal to the ligament of treitz i.e. from esophagus, stomach and duodenum. The incidence of UGIB is approximately 100 cases per 100,000 populations per year[1,2]. The fundamental features are hematemesis (the vomiting of blood) and melena (the passage of black tarry stool)[3].

In developed countries, the incidence of UGIB is decreasing but still it causes significant mortality and morbidity. In the United States the estimated costs from UGIB is about two billion per year and almost 400 thousand hospital admissions are due to this disease. The main culprits for UGIB in developed world are increase use of nonsteroidal anti-inflammatory drugs and high prevalence of Helicobacter pylori infections. The incidence of upper GI bleed increases with age and male to female ration is 1:2. Though a lot of advancement has been done in UGIB management but still complications do occur: with 15% rebleeding and death occur in 13% of the admitted patients. The most common causes of UGIB are bleeding duodenal ulcer (35%) and gastric ulcer (20%)[4]. Bleeding from esophageal varices is responsible for only 5-11% UGIB[4]. Esophageal varices are the dilated sub mucosal veins that develop in the patients with underlying portal hypertension. The most common

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cause of portal hypertension is cirrhosis[5]. Gastro esophageal variceal bleeding occurs in 25 to 35% patients having cirrhosis[6]. Endoscopic treatment and acid suppression with proton-pump inhibitors are most vital in the management of peptic ulcer bleeding and these treatments have reduced mortality[5,6]. Despite recent developments in endoscopic and pharmacological management, non-variceal upper gastrointestinal bleeding (NVUGIB) is still associated with considerable mortality and morbidity[7].

If patient with UGIB is unstable then diagnostic measures should be delayed and the patient should be stabilized first by appropriate resuscitative measures. Aspiration should be given due consideration and if there is risk of aspiration the patient should be intubated. Immediate resuscitation and close observation is required for hemodynamically unstable patients and such patients should be admitted in intensive care unit. After the patient is stable, the patient should be referred to a tertiary care center if advance diagnostic and therapeutic equipment are not available. Patients admitted primarily for upper gastrointestinal bleeding have lower mortality rates compared with patients admitted for other reasons who have subsequent upper gastrointestinal bleeding during their hospitalization. The recently published International Consensus Recommendations on the management of patients with non-variceal upper GI bleeding recommend "early risk stratification", by using validated prognostic scales. Several prognostic catalogs are available, including the Rockall and Baylor scores; however, these include clinical and endoscopic components and are therefore unsuitable for pre-endoscopic triage[8]. Among the recently developed score systems, AIMS65 has been proved to be effective to predict the indoor mortality among patients with UGIB. AIMS65 is a risk score that predicts in-hospital mortality, length of stay, and cost in patients with acute UGIB. The scoring system was named AIMS65 because it consists of the following components: albumin level <3.0 g/dL (A), international normalized ratio (INR) >1.5 (I), altered mental status (M), systolic blood pressure ≤90 mmHg (S), and age >65 years. When more than two components of AIMS65 are present, the mortality risk is considered to be high[9]. The mortality rate increased significantly as the number of risk factors was increased[10].

The rationale of this study was to predict the mortality in UGIB patients in our settings by using simple clinical and non-invasive laboratory parameters in order to classify the patients into the high risk and the low risk groups and minimizing the unnecessary admissions in ICU in resource limited country and this may also help in reducing the mortality by early management and referral.

## MATERIAL AND METHODS

This descriptive case series study was carried out in the department of Accident and Emergency and the department of Medicine, Combined Military Hospital, Quetta from Sep 2015 to Sep 2016 after getting due approval from the hospital ethical committee. Based on prevalence of mortality in UGIB with AIMS65 Score >3 being 9%[1], desired precision on 4.5% and confidence level of 95%, the sample size calculated by the sample size calculator gives a sample size of 156. The sample technique used was non probability consecutive sampling. Patients included in the study were those patient's aged 18-75 years of either gender having AIMS65 score>3 with UGIB, defined by the presence of hematemesis, melena or hematochezia, and/or a positive N/G tube aspiration for coffee ground, black or bloody contents. Patients presenting after 72 hours of upper GI bleeding and those patients who were with co-morbid conditions like cancer, chronic kidney disease, obscure GI bleed and follow-up loss were excluded from the study. Blood pressure was recorded manually by mercury sphygmomanometer. Blood samples of patients were collected for serum albumin and inter-national normalized ratio (INR). Laboratory investigations were sent to hospital laboratory which is headed by classified pathologist.

**Data Collection**

Patients fulfilling the selection criteria were explained the nature and purpose of study and informed consent would be sought. Blood samples of patients were One hundred fifty five patients were recruited for the study and their serum albumin, INR, mental status; systolic blood pressure and age were recorded. Based on the variables noted in the Performa, and AIMS65 mortality score of UGIB was calculated.

Each risk factor (variable) carries one point. Albumin levels less than 3.0 gms/dl, international normalized ratio (INR) greater than 1.5, Altered mental status (GCS less than 14, disorientation, lethargy, stupor or coma), systolic blood pressure of 90mm Hg or less and age >65 years each carries one point. Thirty days mortality was calculated in patients with AIMS65 Score>3. If the patients were discharged before time then outcome was determined by telephone.

**Data Analysis**

SPSS (version 23) was used to enter and analyze the data. Mean and standard deviation was calculated for quantitative variables like age, serum albumin, INR and systolic BP. Frequency and percentages was calculated for qualitative variables like mental status and mortality.

Effect modifiers like age, gender and base line AIM was controlled by stratification. Post stratification chi-square test was applied. A *p*-value <0.05 was considered significant.

**Table-I: Comparison of mortality with age of the patients (n=156).**

| Age (in years) | Mortality | | Total | *p*-value |
|---|---|---|---|---|
| | Yes | No | | |
| ≤65 | 17 (18.7%) | 74 (81.3) | 91 (100) | 0.003 |
| >65 | 2 (3.1%) | 63 (96.9) | 65 (100) | |
| Total | 19 (12.2%) | 137 (87.8) | 156 (100) | |

**Table-II: Comparison of mortality with serum albumin level (n=156).**

| Serum Albumin Level (in g/dl) | Mortality | | Total | *p*-value |
|---|---|---|---|---|
| | Yes | No | | |
| ≤3 | 7 (5.6%) | 119 (94.4) | 126 (100) | <0.001 |
| >3 | 12 (40%) | 18 (60) | 30 (100) | |
| Total | 19 (12.2%) | 137 (95.1) | 156 (100) | |

**Table-III: Comparison of mortality with inr level (n=156).**

| INR | Mortality | | Total | *p*-value |
|---|---|---|---|---|
| | Yes | No | | |
| ≤1.5 | 12 (50%) | 12 (50) | 24 (100) | <0.001 |
| >1.5 | 7 (5.3%) | 125 (94.7) | 132 (100) | |
| Total | 19 (12.2%) | 137 (87.8) | 156 (100) | |

**Table-IV: Comparison of mortality with systolic blood pressure (n=156).**

| Systolic Blood Pressure (in mm/Hg) | Mortality | | Total | *p*-value |
|---|---|---|---|---|
| | Yes | No | | |
| ≤90 | 5 (3.7%) | 129 (96.3) | 134 (100) | <0.001 |
| >90 | 14 (63.6%) | 8 (36.4) | 22 (100) | |
| Total | 19 (12.2%) | 137 (87.8) | 156 (100) | |

**Table-V: Comparison of mortality with alteration in mental status (n=156).**

| Alteration in Mental Status | Mortality | | Total | *p*-value |
|---|---|---|---|---|
| | Yes | No | | |
| Yes | 1 (0.8%) | 130 (99.2) | 131 (100) | <0.001 |
| No | 18 (72%) | 7 (28) | 25 (100) | |
| Total | 19 (12.2%) | 137 (87.8) | 156 (100) | |

## RESULTS

Mean age of the patients was 57.69 ± 16.68 years with majority of the patients, 91 (58.3%) with <65 years of age as shown in table-I. There were 51 (32.7%) females and 105 (67.3%) males. Mean serum albumin level was 3.53 ± 0.44 g/dl with majority of the patients 126 (80.8%) with ≤1.3 g/dl of serum albumin level. Majority of the patients 132 (84.6%) were presented with >1.5 INR. Mean systolic blood pressure was 92.72 ± 3.26 mm/Hg with majority of the patients 134 (85.9%) with ≤90 mm/Hg of systolic blood pressure. Alteration in mental status was observed in 131 (84%) patients. Mortality was observed in 19 (12.2%) patients.

Stratification was done to see the effect of age, gender and baseline AIM on the outcome. Results are shown in table-I to V.

## DISCUSSION

Different scores systems have been developed to predict mortality and morbidity of patients from upper gastrointestinal bleedings. Among the different score systems include full Rockall scores, Glasgow-Blatchford score (GBS), pre-endoscopy Rockall, andAIMS65 score. Each score system has its advantages and disadvantages. Regarding inpatients mortality, AIMS65 has been shown to be superior to other score systems [11]. In this study, mortality was observed in 19 (12.2%) patients with upper GI bleed having AIMS65 score>3. Two recent reports confirmed the applicability of AIMS65 in acute upper GI bleeding patients, including bleeding of variceal and non-variceal origin[9,12]. However, whether the AIMS65 score is applicable for predicting outcomes in patients of non-variceal GI bleeding remains uncertain, since 2 of the 5 risk factors in AIMS65 scores are generally accepted as poor prognostic factors of liver cirrhosis, i.e. serum albumin <3.0g/dL and INR >1.5. Therefore, the AIMS65 score might be useful for predicting outcomes in variceal GI bleeding but not in non-variceal GI bleeding.

Interestingly, the mean serum albumin level in the poor outcomes group was slightly lower than that in the good outcomes group although this difference was not statistically significant ($p$=0.072). This may have been caused by the inclusion of patients with co-morbidities other than liver cirrhosis in the poor outcomes group. On the other hand, low serum albumin levels may be a single prognostic factor predicting outcomes in patients with peptic ulcer bleeding. Two recent studies have demonstrated that serum albumin level ≤3 g/dL or <2.6 g/dL is associated with the in-hospital mortality in patients with non-variceal GI bleeding[13,14].

In terms of INR, systemic review has shown that the INR does not predict re-bleeding among NVUGIB patients[15]. However, INR ≥ 1.5 has been shown to be independently associated with in-hospital mortality in upper GI bleeding in the UK[16].

Jung *et al*[17], examined the validity of the novel UGIB risk stratification system AIMS65 in patients presenting with peptic ulcer-related bleeding. The original AIMS65 study included all patients with UGIB irrespective of aetiology[9]. Jung *et al*[17] hypothesized that because three of the five AIMS65 criteria (albumin, altered mental status and INR) are associated with variceal UGIB, AIMS65 may not be applicable to non-variceal UGIB. Although the study's results were interesting, we would like to suggest two considerations.

The authors used a composite endpoint of rebleeding within 30 d of index endoscopy, death within 30 d, repeat endoscopy, surgical intervention or interventional radiology procedure to evaluate the sensitivity and specificity of AIMS65. However, the AIMS65 score was derived and validated for a specific endpoint of in- hospital mortality[9]. It was also found to be accurate for length of stay and cost. Furthermore, the other commonly used scoring systems [Rockall score and Glasgow Blatchford Score (GBS)] were designed for different endpoints to the one used by the authors.

Second, this study[17] did not compare the performance of AIMS65 with any of the existing

risk stratification scores. Although the authors aim was to investigate the applicability of AIMS65 in peptic ulcerrelated bleeding, the important unanswered clinical question is which risk stratification score is best in terms of accuracy and ease of use in the clinical setting. Despite consensus guidelines recommending the use of risk scoring systems, there has not been widespread adoption in clinical practice. This appears mainly due to their complexity of use and/or the requirement of endoscopic data to calculate the score.

Although AIMS65 needs to be further validated, it has the advantages of simplicity and lack of subjectivity compared to existing scoring systems. It has been recently validated for in-hospital mortality[9], 30 and 90 d mortality[18] and compared favorably to the GBS for in-hospital mortality[12]. Further studies are required to determine the future role of AIMS65 as a useful clinical tool for risk stratification of UGIB.

## CONCLUSION

AIMS65 score is a good predictor of UGIB related mortality. Mortality increases with increasing AIMS65 score.

## CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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