

Validation of High Aims 65 Score in Patients with Variceal Bleed

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ABSTRACT

Objective: To validate high AIMS 65 score for predicting 30-day mortality in patients with variceal bleed presenting to a tertiary care hospital.

Study Design: Prospective longitudinal study.

Place and Duration of Study: Department of Gastroenterology, Liaquat National Hospital Karachi, Pakistan from Aug 2021 to Apr 2022.

Methodology: Cirrhotic patients having variceal bleeding requiring hospital admission, aged 18-60 years of either gender, with history of hematemesis and/or melena were assessed clinically and enrolled into the study after taking consent. All the patients underwent esophagogastroduodenoscopy at the endoscopy suite. Laboratory investigations were done upon their hospital admission to figure out the AIMS 65 score. Patients' demographic and clinical details were documented in a pre-designed proforma by the assigned data collectors.

Results: 267 patients were enrolled with median age of 57(interquartile range=50-63) Median CLD duration of 48 months (IQR=36-60). There was a predominance of male patients (67.4%). Majority of the patients had AIMS score of 2(56.2%) whereas 43.8% had score of 3.30 days whereas mortality was observed in 19.1% of the cases. The frequency of mortality was significantly higher in patients having AIMS score of 3 as compared to AIMS score of 2 (70.1% versus 29.9%, $p<0.001$). Area under the curve of AIMS65 score was 65% (95% CI: 0.57-0.74, $p=0.010$).

Conclusion: The study shows a rise in mortality with increasing score of AIMS65. However, AIMS65 was not found to be accurate tool for predicting mortality in cases of variceal bleeding.

This study analyzed 30 days mortality in nearly one-fifth of the variceal bleed patients.

Keywords: AIMS 65, Upper gastrointestinal bleeding, Variceal bleeding, 30 days mortality

How to Cite This Article: Saeed A, Haq MMU, Rahat A. Validation of High Aims 65 Score in Patients with Variceal Bleed. *Pak Armed Forces Med J* 2025; 75(1): 49-53. DOI: <https://doi.org/10.51253/pafmj.v75i1.10110>

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INTRODUCTION

Chronic liver disease (CLD) and related complications are prevalent globally which could be a result of different etiologies, such as obesity, non-alcoholic fatty liver disease, alcohol abuse, viral hepatitis, autoimmune diseases, cholestatic diseases, and iron or copper overload. One of the most frequent long standing complications is cirrhosis which is a consequence of replacement of the normal liver parenchyma with fibrotic tissue and regenerative nodules, leading to portal hypertension¹. Acute variceal bleeding (AVB) is a life threatening complication of cirrhosis leading to cirrhosis-related deaths in one-third of the patients². Acute variceal bleeding is complex and management often requires multidisciplinary approach requiring pharmacological, endoscopic, and/or radiologic interventions. Management includes primary and secondary prophylaxis to prevent bleeding in future³.

Regardless of improvements in diagnosis and management of esophageal and gastric varices, mortality rates up to 30% in patients with Child-Pugh C liver disease have been observed, primarily due to upper GI bleeding with peak mortality observed in first 6 weeks of bleeding. Hepatic functional status, renal dysfunction and super added bacterial infections lead to further increase in mortality rate.^{4,5}

Early risk stratification scores usage in patients with decompensated cirrhosis having upper gastrointestinal bleeding decreases expenditure and funds capital without manipulating the results of patients⁶. Conventional scoring systems encompassed Rockall score, Glasgow-Blatchford score (GBS), but these scores were not designed for patients with decompensated liver disease with cirrhosis. However these scoring systems were successful in predicting mortality risk in patients with nonvariceal upper gastrointestinal bleeding as per recent studies^{7,8}. Lately, a scoring system named AIMS 65 was proposed for likelihood of mortality in UGIB with the resolution of managing low risks patients as out-

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Received: 21 Feb 2023; revision received: 23 Apr 2023; accepted: 11 Sep 2023

patient department and minimizing the cost. The parameters for scoring includes albumin level <3.0 g/dL (A), international normalized ratio (INR) >1.5 (I), altered mental status (M), systolic blood pressure ≤ 90 mm Hg (S), and age >65 years with higher mortality risk when any of these two criteria are met⁹. Conversely, variation in results is reported regarding the applicability of this score. Some studies concluded that these scores are not useful for predicting outcomes in patients with AVB¹⁰ while, on other hand some authors showed that AIMS65 scores can predict mortality.

Early prediction of mortality risk is helpful in deciding the preventive strategies and for appropriate counseling of patients and their families. The existing literature reports the conflicting evidence regarding the role of AIMS 65 in acute variceal bleed. Moreover, similar data is scanty in Pakistan. Therefore to fill this gap, this study was planned for validation of AIMS 65 score in variceal bleeding cases for mortality prediction.

METHODOLOGY

This prospective longitudinal study was conducted at the Department of Gastroenterology, Liaquat National Hospital with the approval from Hospital Ethics Committee (IRB #:0647-2021) from August 2021 to April 2022. A written informed consent was taken from patients before their enrolment into the study. Previously conducted study reported that mortality rate among patients with gastrointestinal bleed was 12.2%¹¹. At 95% confidence interval and 5% precision, a sample of total 165 patients was required. Open-Epi calculator was used for performing sample size estimation. Non-probability consecutive sampling technique was used to enroll study participants.

Inclusion criteria: All cirrhotic patients having variceal bleeding requiring hospital admission and visiting either the emergency or the out-patient department, of age range 18-60 years of any gender, with history of hematemesis and/or melena, were assessed clinically and enrolled into the study.

Exclusion criteria: Pregnant women, patients with gastric carcinoma and those not willing to participate into this study were excluded from this study.

Variceal bleeding was defined as hematemesis and/or melena, with esophageal or gastric varices identified during upper gastrointestinal endoscopy and no other lesion that might explain the bleeding episode. All the patients underwent necessary

laboratory investigation and their AIMS score was calculated upon receiving their laboratory reports and esophagogastroduodenoscopy was performed in the endoscopy suite. Patients' demographic details including age, gender and clinical features such as duration of chronic liver diseases (CLD), Child Pugh's score, viral marker, AIMS65 score, endoscopic findings and 30 days mortality was documented in a pre-designed proforma by the assigned data collectors. Telephonic calls were made to confirm the 30 day mortality status.

Data was entered into SPSS version 21 for statistical analysis. Data consisted of categories was computed as frequency and percentage. Continuous type of data was expressed as median with IQR as it was non-normally distributed as assessed by application of Shapiro-Wilk test. Categorical variable were compared among patients with and without 30 day mortality using Chi-square or Fisher-exact test. Mann-Whitney U test was applied for comparison of non-normally distributed variables among dead and alive patients. Received operating characteristic curve was plotted for computation of area under the curve (AUC) to figure out the predictive ability of AIMS 65 score. The *p*-values less than or equal to 0.05 was taken as statistically significant.

RESULTS

Total 267 patients were studied with median age of 57 (IQR=50-63) year and CLD duration of 48 (IQR=36-60) months. Nearly two-third of the patients were males (67.4%). Figure shows the frequency of Child-Pugh class among studied subjects. Table-I shows statistics for clinical features.

Table-I: Overview of Patients Clinical Characteristics (n=267)

Variables	Frequency (%)
Viral Marker	
Hepatitis B Virus	72(26.6)
Hepatitis C Virus	192(71.9)
Hepatitis B Virus & Hepatitis D Virus	2(0.7)
Hepatitis B Virus & Hepatitis C Virus	1(0.4)
Fundal varices	14(5.2)
Esophageal varices	264(98.9)
Gastric antral vascular ectasia	4(1.5)
Portal hypertension	260(97.4)
Child -Pugh class	
A (≤ 6)	66(24.7)
B (7-9)	145(54.3)
C (10-15)	56(21)

30 days mortality was observed in 19.1% of the cases. Median AIMS65 score was 2 (IQR=2-3). Majority had AIMS score of 2(56.2%) whereas 43.8% had score of 3. Table-II shows comparison of patients' features among dead and alive patients. None of the variable was significantly different among alive and dead patients except Child-Pugh class with higher frequency of mortality among patients having class of¹⁰⁻¹⁵ as compared to other two categories ($p=0.031$).

Table-III shows the comparison of mortality having AIMS score 65. The frequency of mortality was significantly higher in patients having AIMS score of 3 as compared to AIMS score of 2 ($p<0.001$). The area under curve of AIMS65 score was AUC=0.65, 95% CI: 0.57-0.74, $p=0.01$. Receiver operating characteristic curve is shown in Figure.

Table-II: Comparison of Features Among Deceased patients and Alive Patients (n=267)

Study variables	Alive (n=51) n(%)	Deceased (n=216) n(%)	p-value
Age (in years)#	57(50 – 63)	57(50 – 61)	0.87
Disease duration (in months)#	48(36 – 53.3)	48(36 – 60)	0.26
Gender			
Male	152(84)	29(16)	0.06
Female	64(74.4)	22(25.6)	
Child –Pugh class			
A ≤6	53(80.3)	13(19.7)	*0.04
B 7-9	124(85.5)	21(14.5)	
C 10-15	39(69.6)	17(30.4)	
Viral marker			
HBV	57(79.2)	15(20.8)	†0.85
HCV	156(81.3)	36(18.8)	
HBV& HDV	2(100)	0(0)	
HBV & HCV	1(100)	0(0)	
Fundal varices	9(64.3)	5(35.7)	†0.15
Gastric varices	3(75)	1(25)	†0.57
Portal Hypertension	210(80.8)	50(19.2)	†1.00

#: Numerical variables presented as median (IQR), †: Fisher-exact test was reported, *Significant at $p<0.05$, HBV: Hepatitis B Virus, HCV: Hepatitis C Virus, HDV: Hepatitis D virus

Table-III: Comparison of AIMS score among deceased and alive patients (n=267)

AIMS score	Alive (n=51) n(%)	Dead (n=216) n(%)	p-value
Score of 2	16(10.7)	134(89.3)	**<0.001
Score of 3	35(29.9)	82(70.1)	

DISCUSSION

Acute upper GI bleed secondary to varices vestiges a fatal complication in decompensated cirrhosis with pitiable outcomes, exhibited by severe

portal hypertension and leading to liver failure.¹²⁻¹³ In our study, the median age of patients presenting with variceal bleeding was 57 years which is in agreement with other Pakistani studies that reported mean age of the patients with variceal bleed was 57.69 ± 16.68 years¹³. Active bleeding at the time of endoscopy is associated with poor outcomes, clinicians may be keen to identify those at higher risk for need of timely endoscopic treatment, to direct such patients to urgent endoscopy on the front line. It is important to triage patients with higher risks in AVB as soon as possible and to tailor the best treatment strategy.¹⁴⁻¹⁵ Zaghloul *et al.*, performed a study in Egypt for evaluation of predictors of variceal bleeding following esophageal varices, who also reported a mean age of 57 ± 9.539 years¹⁶. An Indian study comparing different risk scores in UGIB reported that mean age of patients was 43.5 ± 17.2 years with variceal bleeding the commonest etiology of UGIB¹⁷. Another Indian study also reported a mean age of 45 ± 15 years among patients having variceal bleeding¹⁸. However, a Mexican study reported the similar age of patients that we demonstrated i.e. a mean age of 54.1 ± 12.6 years¹². The most probable reason of variability is different region, environment and different lifestyles influencing the disease onset.

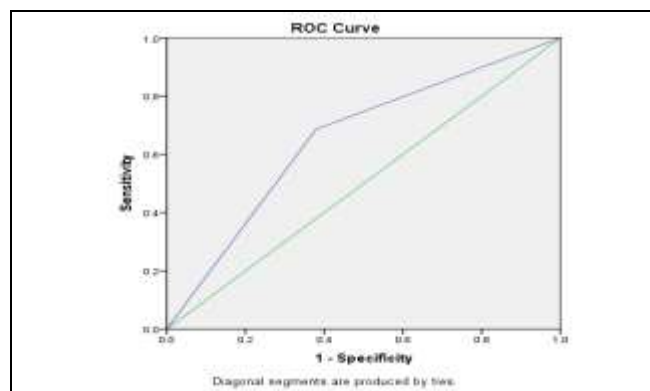


Figure: Receiver operating characteristic curve of AIMS 65 score for predicting mortality (n=267)

Therefore, validation of algorithms such as Model for End-Stage Liver Disease (MELD) and Child-Turcotte-Pugh (CTP) scores have been considered predictive of mortality in AVB¹⁴. Most are cumbersome, require multiple variables including endoscopic appearances, and cannot be applied in the earlier stages, especially in emergent settings. The most widely applied scoring systems include the Glasgow-Blatchford Bleeding Score (GBS) and the Rockall score (RS). A recently proposed scoring

system, AIMS65 is found to be simple and easy to memorize¹⁵.

Acute Variceal bleeding necessitates hospitalization in monitoring setup for urgent interventions and intensive care monitoring. Contrarily, frequently low-risk Non Variceal upper GI bleed patients can be discharged safe and sound and can be treated and followed up as outpatient¹⁴⁻¹⁶. In decompensated cirrhosis, mortality is rarely related to UGIB itself but somewhat due to concomitant conditions. Suitable risk impost for triage and prognostic valves enables urgent endoscopy and intervention for high-risk patients. However, it helps to release low risk patients to be managed safely as outpatient basis¹⁷⁻¹⁸. The present study showed 30 days mortality in nearly one-fifth of the patients (19.1%). A mortality rate of 12.2% was observed in a study by RJ Akbar *et al.*,¹¹. Interestingly, RJ Akbar *et al.*,¹¹ assessed 30 days mortality in patients with AIMS 65 score of >3 and still the mortality was lower than what was observed in this study. Another Pakistani study ascertaining the diagnostic accuracy of AIMS 65 score in foreseeing outcomes in Variceal Bleeding cases in a tertiary care hospital in Karachi, demonstrated a mortality rate of 21% was observed during 30 days follow-up¹⁹. Another study reported in-hospital mortality of 13% among patients with acute variceal bleeding¹². A Korean study reported 12.5% 30 day mortality rate among this population²⁰.

In this study, AIMS score of 2 and 3 were observed among 56.2% and 43.8% patients respectively. Furthermore, 30 days mortality was higher among AIMS score of 3 as compared to score of 2 (29.9% versus 10.7%). Study by Kuba *et al.*, also demonstrated that the AIMS 65 score was significantly higher among the patients who experienced in hospital mortality as compared to those who survived 1.3±1.0 versus 2.7±1.013.

The results regarding the accuracy of the score for predicting 30 days mortality are variable in the existing literature. Mujtaba *et al.*, found the sensitivity and specificity of AIMS 65 score of 77.4% and 84.4% respectively with overall diagnostic accuracy of 82.93%. However, this study did not mention the criteria for which diagnostic measures were determined¹⁹. RJ Akbar *et al.*, determined the applicability of AIMS65 score in UGIB but they enrolled the patients with AIMS score of more than 3 and then compared all of AIMS parameters with mortality and on the basis of significant difference of

AIMS parameters among dead and alive patients, a conclusion was given that it was an accurate score for predicting mortality. However, this approach does not seem to be appropriate for deciding the tool accuracy¹¹. Another study intended to compare predictive ability of different scoring tools for 6 weeks mortality and they found AUC of 67% indicating that the tool is not accurate for prediction of 6 week mortality²¹. An Indian study reported that AIMS65 had AUC of 67.4% for mortality prediction of 30 days¹⁸. A Mexican study computed a higher AUC of 81.7% and concluded that the score is useful in predicting in-hospital mortality¹². An Australian study found a good accuracy for in-hospital mortality with 82% AUC. The plausible causes of contradictory findings could be the difference in method of detection of variceal bleeding, simply the handling and difference in visuals may bring biased in interpretation of the findings and the second cause of variability at different follow-up timing.

LIMITATIONS OF THE STUDY

The present study suffers with certain limitations such as risk of ICU admission, re-bleeding and blood transfusion were not predicted and only 30 days mortality was ascertained. The study was not focused to make comparison of AIMS65 with other existing prediction tools. The study was conducted in single center in Karachi with limited sample size. We suggest to conduct a multi-center study with larger sample size and evaluating the performance of the AIMS65 for mortality prediction at different time intervals. The future prospective will be able to fill the gap of this study.

CONCLUSION

This study analyzed 30 days mortality in nearly one-fifth of the variceal bleed patients. There was rise in mortality with increasing score of AIMS65. However, AIMS65 was not found to be accurate tool to predicting mortality in cases of variceal bleeding.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AS & MMUH: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

AR: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Ginès P, Krag A, Abraldes G, Solà E, Fabrellas N, Kamath S. Liver cirrhosis. *Lancet*. 2021; 398(10308): 1359-1376. [https://doi.org/10.1016/s0140-6736\(21\)01374-x](https://doi.org/10.1016/s0140-6736(21)01374-x)
2. Tayyem O, Bilal M, Samuel R, Merwat SK. Evaluation and management of variceal bleeding. *Dis Mon*. 2018; 64(7): 312-320. <https://doi.org/10.1016/j.disamonth.2018.02.001>
3. Alqahtani A, Jang S. Pathophysiology and Management of Variceal Bleeding. *Drugs*. 2021; 81(6): 647-667. <https://doi.org/10.1007/s40265-021-01493-2>
4. Majeed A, Majumdar A, Bailey M, Kemp W, Bellomo R, Pilcher D, *et al.*, Declining Mortality of Cirrhotic Variceal Bleeding Requiring Admission to Intensive Care: A Binational Cohort Study. *Crit Care Med*. 2019; 47(10): 1317-1323. <https://doi.org/10.1097/ccm.0000000000003902>
5. Mehmood T, Zia Q, Latif A, Ansar S. Mortality Related Factors in Patients with Variceal Bleeding with MELD Score $\geq$ 18. *J Coll Physicians Surg Pak*. 2019; 29(12): 1199-1202. <https://doi.org/10.29271/jcpsp.2019.12.1199>
6. Monteiro S, Gonçalves C, Magalhães J, Cotter J. Upper gastrointestinal bleeding risk scores: Who, when and why? *World J Gastrointest Pathophysiol*. 2016; 7(1): 86-96. <https://doi.org/10.4291/wjgp.v7.i1.86>
7. Kawaguchi K, Isomoto H. Validation of AIMS65 to predict outcomes in acute variceal bleeding: Which risk scoring system outperforms in real practice? *Dig Endosc*. 2020; 32(5): 739-741. <https://doi.org/10.1111/den.13657>
8. Kim S, Choi J. AIMS65 scoring system is comparable to Glasgow-Blatchford score or Rockall score for prediction of clinical outcomes for non-variceal upper gastrointestinal bleeding. *BMC gastroenterol*. 2019; 19(1): 136. <https://doi.org/10.1186/s12876-019-1051-8>
9. Saltzman R, Tabak P, Hyett H, Sun X, Travis C, Johannes S. A simple risk score accurately predicts in-hospital mortality, length of stay, and cost in acute upper GI bleeding. *Gastrointest Endosc*. 2011; 74(6): 1215-1224. <https://doi.org/10.1016/j.gie.2011.06.024>
10. Thanapirom K, Ridditid W, Rerknimitr R, Thungsuk R, Noophun P, Wongjitrat C, *et al.*, Prospective comparison of three risk scoring systems in non-variceal and variceal upper gastrointestinal bleeding. *J Gastroenterol Hepatol*. 2016; 31(4): 761-767. <https://doi.org/10.1111/jgh.13222>
11. Akbar J, Yousaf A, Waheed W, Qadir M, Ali S, Javaid H. Role OF AIMS65 score in determining frequency of mortality in patients with upper gastrointestinal bleed. *Pak Army Forced Med J*. 2019; 69(2): 245-249.
12. Budimir I, Gradišer M, Nikolić M, Baršić N, Ljubičić N, Kralj D, *et al.*, Glasgow Blatchford, pre-endoscopic Rockall and AIMS65 scores show no difference in predicting rebleeding rate and mortality in variceal bleeding. *Scand J Gastroenterol*. 2016; 51(11): 1375-1379. <https://doi.org/10.1080/00365521.2016.1200138>
13. Kuba M, Escobedo A, Tellez F, Altamirano J, Aguilar N, González A, *et al.*, Validation of prognostic scores for clinical outcomes in cirrhotic patients with acute variceal bleeding. *Ann Hepatol*. 2016; 15(6): 895-901. <https://doi.org/10.5604/16652681.1222107>
14. Garcia G, Abraldes G, Berzigotti A, Bosch J. Portal hypertensive bleeding in cirrhosis: Risk stratification, diagnosis, and management: 2016 practice guidance by the American Association for the study of liver diseases. *Hepatology*. 2017; 65(1): 310-335. <https://doi.org/10.1002/hep.28906>
15. Barkun N, Almadi M, Kuipers J, Laine L, Sung J, Tse F, *et al.*, Management of Nonvariceal Upper Gastrointestinal Bleeding: Guideline Recommendations From the International Consensus Group. *Ann Intern Med*. 2019; 171(11): 805-822. <https://doi.org/10.7326/m19-1795>
16. Zaghloul G, El Hady A, Hussein M, Hassan A. Predictors Of Variceal Bleeding After Esophageal Varices Band Ligation In Egyptian Cirrhotic Patients. *Zagazig Univ Med J*. 2018; 24(1): 80-92. <https://doi.org/10.21608/zumj.2018.13009>
17. Chandnani S, Rath P, Sonthalia N, Udgirkar S, Jain S, Contractor Q, *et al.*, Comparison of risk scores in upper gastrointestinal bleeding in western India: A prospective analysis. *Indian J Gastroenterol*. 2019; 38(2): 117-127. <https://doi.org/10.1590/s0004-2803.201900000-54>
18. Chandnani S, Rath P, Udgirkar S, Sonthalia N, Contractor Q, Jain S. Clinical utility of risk scores in variceal bleeding. *Arq Gastroenterol*. 2019; 56(3): 286-293. <https://doi.org/10.1590/s0004-2803.201900000-54>
19. Mujtaba G, Kalwar A, Shaikh T, Khalid T, Shaikh N, Manzoor W. Diagnostic accuracy of AIMS-65 clinical scoring system in predicting outcome in patients with upper gastrointestinal bleeding presenting at Tertiary Care Hospital, Karachi. *Profess Med J*. 2020; 27(10): 2104-2109. <https://doi.org/10.29309/TPMJ/2020.27.10.4243>
20. Choe W, Kim Y, Hyun J, Jung W, Jung K, Koo S, *et al.*, Is the AIMS 65 Score Useful in Predicting Clinical Outcomes in Korean Patients with Variceal and Nonvariceal Upper Gastrointestinal Bleeding? *Gut Liver*. 2017; 11(6): 813-820. <https://doi.org/10.5009/gnl16607>
21. Aluizio S, Montes G, Reis G, Nagasako K. Risk stratification in acute variceal bleeding: Far from an ideal score. *Clinics (Sao Paulo)*. 2021; 76:e2921. <https://doi.org/10.6061/clinics/2021/e2921>