A Comparative Study of AIMS 65 Score with other Scoring Systems to Predict Outcomes in Patients with Upper GI Bleed in Chronic Liver Disease

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ABSTRACT

Introduction: The AIMS 65 score is a new bedside score proposed for the assessment of liver function which is simple and more independent. Different scores have been recommended to predict outcomes in the setting of upper gastrointestinal bleeding (UGIB), limited comparative studies have been published between simplified versions of older scores and recent scores. In this present study, we aimed to retrospectively compare the performance of AIMS 65 score with Child-Pugh score, MELD score and ALBI score for predicting the outcome in patients with upper GI bleed in chronic liver disease.

Material and Methods: Data of patients with chronic Liver disease secondary to ethanol were retrospectively reviewed. Child Pugh score, MELD score, ALBI score and AIMS 65 score were calculated for the patients and results . ROC curves derived from comparison with outcome and were analysed.

Results: In our study conducted on 112 patients, the age distribution was between 20-85 years with mean age of patients being 46.47 ± 10.9 years, sex ratio Male: Female: 105:7 with mortality rate of 33.92%. The Area under curves of ROC of AIMS65, Child Pugh score, MELD score, ALBI score was 0.779, 0.864, 0.763 and 0.777 respectively.

Conclusion: AIMS 65 is a simple and non-endoscopic score for the prediction of in hospital mortality**.** No statistical difference was observed between AIMS-65 and other scores such as Child Pugh score, ALBI and MELD score.

Keywords: AIMS65 Score, Albumin Bilirubin Score, Acute Upper Gastrointestinal Bleed

INTRODUCTION

Upper Gastro intestinal bleed is one of the major causes of mortality in chronic liver disease patients. The early risk stratification of these patients by using prognostic scales is necessary for early intervention and management. Various scoring systems are in use since many years such as Glasgow Blatchford scale[1] -1997 (GBS) and Complete Rockall Score-1996.[2] These have been shown to predict outcomes in both variceal and non-variceal bleeding.[3] But they are cumbersome in calculating because of their complexity. Various efforts have been made to simplify the scores and newer scores such as modified GBS and Pre-Endoscopy Rockall scores have been introduced, which have performed well in predicting the outcomes.

Other scores such as Child-Pugh score and MELD score have also been studied for their association with the mortality in CLD patients with upper GI bleed due to varices.[4,5] The Child- Pugh Score contains Five Parameters, including the Total Bilirubin, Serum Albumin, Prothrombin time, ascites and Hepatic Encephalopathy. However, the Highly Subjectve evaluation of Ascites and encephalopathy might reduce the accuracy of assessment.[6] The MELD score incorporates 3 laboratory variables, Total Bilirubin, INR and creatinine, and it eliminates the subjective factors.[7] The MELD score was widely used as a scoring system for organ allocation in liver Transplantation and is the current standard prognostic tool for assessing the 3 to 6-month survival in patients with Failure.[8]

Recently ALBI score has been introduced for predicting the outcome in patients with Hepatocellular carcinoma.[9] The albumin-bilirubin (ALBI) grade is an indicator of liver functional reserve. Recent studies have also validated its effectiveness and simplicity in predicting outcome in UGIB in liver cirrhosis.

ALBI score = (log10 bilirubin×0.66) + (albumin×−0.085). In this equation, the unit of bilirubin is umol/L and that of albumin is g/L

In 2011, simple score was introduced AIMS-65 for predicting outcome in the upper GI bleeding. It has been studied in patients with both variceal and non-variceal bleed. AIMS65 does not include endoscopic criteria and has been put forth as a good predictor of length of stay, cost of hospitalization,

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How to cite this article: Nagaraja BS, Madhumathi R, Chidananda V, Sanjeet SB,Abhiman Shetty, Mahadev H Malge. A comparative study of AIMS 65 score with other scoring systems to predict outcomes in patients with upper GI bleed in chronic liver disease. International Journal of Contemporary Medical Research 2019;6(5):E5-E8.

DOI: http://dx.doi.org/10.21276/ijcmr.2019.6.5.13

and mortality.[10] The score comprises of 5 variables

- Albumin (1 point for value less than 3.0 g/dL (30 g/L));
- INR (1 point for value greater than 1.5);
- altered mental status (1 point given if Glasgow coma score was less than 14 or if disorientation, lethargy, stupor, or coma was seen);
- systolic blood pressure (1 point for value less than 90 mmHg);
- age (1 point for value greater than 65 years).

Out of the two common scoring systems not including endoscopic criteria AIMS65 outscored Blatchford score in predicting inpatient mortality from UGIB.[11] Only few studies are available regarding AIMS65 in patients with CLD with upper GI bleed.

Herein, we have attempted to calculate AIMS-65, Albumin Bilirubin (ALBI) score, Child Pugh score and MELD scores for cirrhotic patients complicated with upper Gastro intestinal bleeding and to evaluate the discriminative abilities of AIMS-65, Child-Pugh, model for end-stage liver disease (MELD), and albumin-bilirubin (ALBI) scores in predicting the in-hospital mortality in cirrhotic patients with acute upper gastrointestinal bleeding.

MATERIAL AND METHODS

The study was conducted at Bowring and Lady Curzon Hospital (Affiliated to Bangalore Medical college and Research institute). Cirrhotic patients complicated with acute upper GI bleed admitted in the Hospital between 2016 January and 2016 December were retrospectively reviewed and the data of the patients were collected and analysed appropriately. Patient aged >18 years cirrhotic with upper gastro intestinal bleeding were included in the study. Chronic liver diseases due to other causes with Non-variceal bleed patients were excluded.

Method of collection of Data

Detailed history and clinical Examination were done for all the patients. Routine investigations like CBP, RFT, LFT, serum electrolytes, HIV, HBsAg, HCV, VDRL serology, prothrombin time, APTT, Ultrasound of abdomen, upper GI endoscopy and other relevant investigations were noted. Diagnosis of liver cirrhosis was established by USG abdomen with shrunken liver with altered echo texture.

Complications like anaemia, hepatic encephalopathy, renal dysfunction and mortality secondary to upper GI bleed were noted.

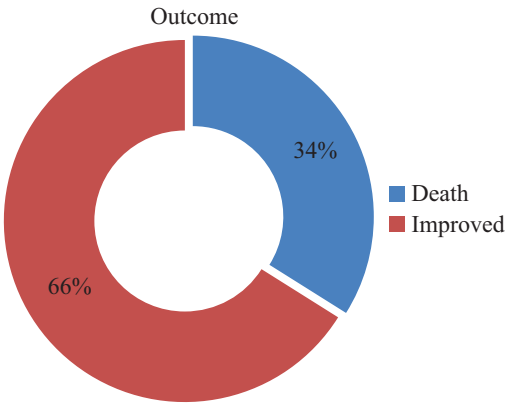
AIMS65, ALBI, Child-Pugh and MELD scores were calculated and compared.

STATISTICAL ANALYSIS

All statistical analysis was performed using the Medcalc software. Continuous Data were expressed as the mean± standard deviation (SD) and median with minimum and maximum. Categorical data were expressed as the frequency. The primary outcome in our study was in-hospital mortality. Receiving-operative characteristics curve analysis were performed to identify the discriminative ability of the AIMS65, ALBI, Child Pugh and MELD scores in predicting in-hospital mortality. Areas under the ROC curves were calculated and compared. The best cut off value was selected as the sum of sensitivity and specificity was maximal. Then sensitivity, specificity, positive likelihood ratio, negative likelihood ratio was reported.

RESULTS

The sample size in our study was 112 patients. The age distribution was between 20-85 years with mean age of patients being 46.47±10.9 years. 105 were males and 7 were



Graph-1 Comparison of in-Hospital mortality with AIMS65, Child PUGH, ALBI and MELD scores:

Variable	AUC	SE[a]	95% CI[b]
childpugh_score	0.864	0.034	0.786 to 0.921
AIMS65 score	0.779	0.0412	0.685 to 0.848
ALBI_score	0.777	0.0448	0.652 to 0.821
MELD_score	0.762	0.0457	0.672 to 0.837

Table-2: Comparison of all 4 Scores.

Difference between areas	0.0850
Standard error[a]	0.0428
Z statistic	1.985
Significance level	0.0471
AIMS65 Score ~ MELD Score	
Difference between areas	0.0171
Standard error[a]	0.0563
Z statistic	0.303
Significance level	0.7619
AIMS65 Score ~ ALBI Score	
Difference between areas	0.0016
Standard error[a]	0.0543
Z statistic	0.029
Significance level	0.9765
Child Phug Score ~ MELD Score	
Difference between areas	0.1021
Standard error[a]	0.0496
Z statistic	2.057
Significance level	0.0397
Child Phug Score ~ ALBI Score	
Difference between areas	0.0866
Standard error[a]	0.0484
Z statistic	1.790
Significance level	0.0734

Table-3: AIMS65 Score ~ Child Phug Score

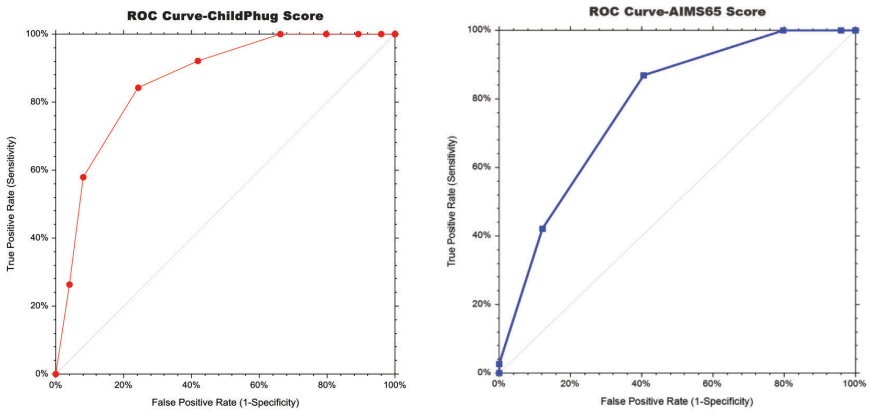


Figure-1 and 2: ROC curves of Child Pugh and AIMS65 scores for predicting In Hospital Mortality

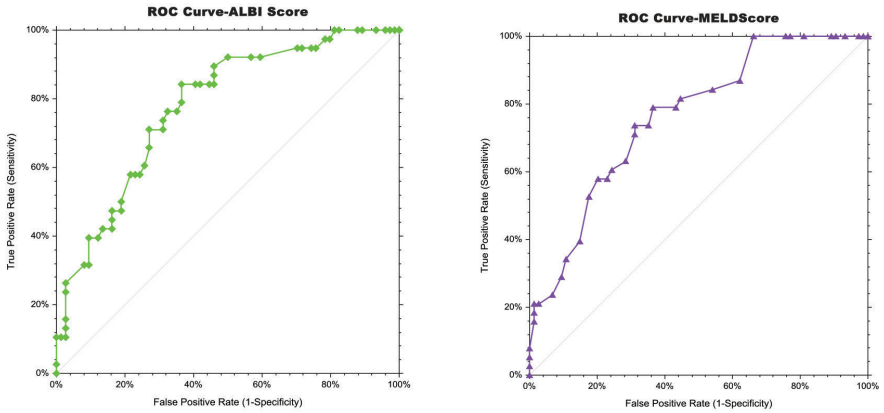


Figure-3 and 4: ROC curves of ALBI and MELD for predicting In Hospital Mortality

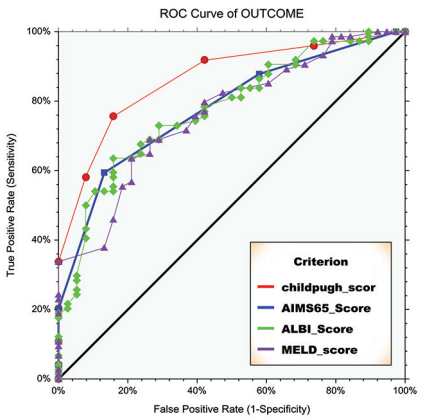


Figure-5: ROC curves of all scores for predicting in hospital mortality

females.

Among 112 patients revived, 38 were deaths and 74 were patients who showed improvement, with mortality percentage of 33.4% (graph-1).

The in-Hospital mortality in our study was 33.9%. The Area under curve (AUC) of the AIMS65 score for predicting the in-hospital mortality was 0.779 (confidence interval:95%: 0.719 -0.956). The best cut-off value of 3, with sensitivity of 86.8%, a specificity of 59.4%, positive likelihood ratio (PLR) of 2.14 and negative likelihood ratio (NLR) 0.22.

The AUC of the Child Pugh score for predicting the in-hospital mortality was 0.864 (confidence interval 95%: 0.780-0.917). The Best cut-off value of the Child-Pugh score was 13, with a sensitivity of 84.2%, a specificity of 75.6%, PLR of 3.46 and NLR of 0.2.

The AUC of the MELD score for predicting the in-hospital mortality was 0.762 (confidence interval 95% 0.656 -0.838). The Best cut-off of the MELD score was 26, with a sensitivity of 73.7%, a specificity of 68.9%, PLR of 2.37 and NLR of 0.381.

Order: CHILD-PUGH >AIMS65 > ALBI> MELD (figure-1,2,3,4), table-2.

The Area under curve (AUC) of the ALBI score for predicting the in-hospital mortality was 0.777 (confidence interval:95%: 0.687 -0.939). The best cut-off value of 1.11, with sensitivity of 84.2%, a specificity of 63.5%, positive likelihood ratio (PLR) of 2.30 and negative likelihood ratio (NLR) 0.25.

The AUC for predicting the in-hospital mortality was significantly different between the Child Pugh versus AIMS65, ALBI and MELD scores. (Child pugh and AIMS65: P= 0.047; Child pugh and ALBI: P= 0.073; Child pugh and MELD: P= 0.0397) (table-3).

DISCUSSION

We studied 112 patients with chronic liver disease (secondary to ethanol) presenting with upper GI bleed, predominantly male (93.8%). Majority of patients were in the group of 41-50 years amounting to 42%. Mortality in our group was 33.4%.

In our study area under the curve of AIMS65 score is 0.779.

In a study by Saltzman et al[10], AUROC for AIMS65 was 0.80 and it was stated that it predicts in hospital mortality accurately. Our finding was comparable with another study by Thandassery R B et al[12], in which the AUROC was 0.74 for mortality. In another study by Gamal et al[13], AIMS65 score outperformed other scores with the AUROC of 0.946 compared to Child Pugh score.

In our study Child Pugh score (AUROC-0.864) outperformed other scores in predicting mortality in chronic liver disease patients. The order in our study was Child Pugh > AIMS65(0.779), ALBI(AUROC-0.777) and MELD (0.762).

In a retrospective multicenter study done by Miguel Motola-Kuba et al that included 160 cirrhotic patients with acute variceal bleeding concluded that AIMS65 score is accurate for predicting in-hospital mortality in cirrhotic patients with acute variceal bleeding. Other scoring systems like Glasgow-Blatchford and Rockall scores might be useful for predicting rebleeding.[14]

In a retrospective study done by Sung Min Park et al that included 523 patients with Nonvariceal Upper Gastrointestinal Bleeding concluded that AIMS65 score was useful for predicting the 30-day mortality, transfusion requirement, and endoscopic intervention in Korean patients with acute Nonvariceal Upper Gastrointestinal Bleeding.[15]

In a prospective study done by Asmaa Naser Mohammad et al included 120 cirrhotic patients with acute variceal bleeding concluded that AIMS 65 score has the best sensitivity, specificity negative and positive predictive values. Although AIMS65 score was not significantly different from MELD, SOFA, and APACHEII scores, it was the best among them in prediction of mortality.[16]

Limitations

In this study, Glasgow-Blatchford score(GBS) and Rockall score were not compared with AIMS 65 score, which are the best known and most widely used scoring systems for patients with UGIB. GBS has superior sensitivity relative to the AIMS65 in identifying patients who were not likely to require interventions, including emergency endoscopy.

CONCLUSION

AIMS65 is a simple bedside pre-endoscopy score for predicting the in-hospital mortality in CLD patients with upper GI bleed. The optimum cut-off value being ≥3, and also it has the similar prognostic performance compared to ALBI and MELD score, hence can be used in peripheral centres to assess the prognosis of CLD patients presenting with complications like Upper GI Bleed.

REFERENCES

1. Hyett BH, Abougergi MS, Charpentier JP, Kumar NL, Brozovic S, Claggett BL, Travis AC, Saltzman JR. The AIMS65 score compared with the Glasgow-Blatchford score in predicting outcomes in upper GI bleeding. Gastrointest Endosc. 2013;77:551-7.
2. Tham TC, James C, Kelly M. Predicting outcome of acute non-variceal upper gastrointestinal haemorrhage without endoscopy using the clinical Rockall Score. Postgraduate Med J. 2006;82:757-9.
3. Lino C, Shimoyama T, Igarashi T, et al. Validity of the Pre-endoscopic Scoring Systems for the Prediction of the Failure of Endoscopic Hemostasis in Bleeding Gastroduodenal Peptic Ulcers. Intern Med. 2018;57:1355-1360.
4. Child CG, Turcotte J G. Surgery and portal Hypertension, major problem Clinical Surgery 1964: 1: 1-85.
5. Kamath P S, Kim W R. The Model for end stage liver disease (MELD) Hepatology 2007:45:797-805.
6. North Italian Endoscopic Club For study and treatment of Esophageal varices. Prediction of the First variceal Haemorrhage in Patients with cirrhosis of the liver and esophageal varices. A prospective Multicentre Study N.ENGL.J.MED. 1988; 319: 983-989.
7. Kamath P S, Weisner R H, Malinchoc M, et al. A Model to predict survival in patients with end stage liver disease. Hepatology 2001; 33:464-70
8. Freeman et al, The new liver allocation System: moving toward evidence based transplantation policy, liver Transpl 2002;8:851-8.
9. Johnson PJ, Berhane S, Kagebayashi C, Satomura S, Teng M, Reeves HL, O'Beirne J, Fox R, Skowronska A, Palmer D, Yeo W. Assessment of liver function in patients with hepatocellular carcinoma: a new evidence-based approach: the ALBI grade. J Clin Oncol. 2015;33:550.
10. Saltzman JR, Tabak YP, Hyett BH, Sun X, Travis AC, Johannes RS. A simple risk score accurately predicts in-hospital mortality, length of stay, and cost in acute upper GI bleeding. Gastrointestinal Endosc. 2011;74:1215-24.
11. Hyett BH, Abougergi MS, Charpentier JP, Kumar NL, Brozovic S, Claggett BL, Travis AC, Saltzman JR. The AIMS65 score compared with the Glasgow-Blatchford score in predicting outcomes in upper GI bleeding. Gastrointest Endosc. 2013;77:551-7.
12. Thandassery RB, Sharma M, John AK, et al. Clinical Application of AIMS65 Scores to Predict Outcomes in Patients with Upper Gastrointestinal Hemorrhage. Clin Endosc. 2015;48:380-4.
13. El-Deeb GS, EL-Hamouly MS, Abdel-Hakeem MS. Prognostic value of AIMS65 score in patients with chronic liver diseases with upper gastrointestinal bleeding. Menoufia Med J 2018;31:317-23.
14. Motola-Kuba M, Escobedo-Arzate A, Tellez-Avila F, Altamirano J, Aguilar-Olivos N, et al. Validation of prognostic scores for clinical outcomes in cirrhotic patients with acute variceal bleeding. Annals of hepatology. 2017;15:895-901.
15. Park SM, Yeum SC, Kim BW, Kim JS, Kim JH, et al. Comparison of AIMS65 score and other scoring systems for predicting clinical outcomes in Koreans with nonvariceal upper gastrointestinal bleeding. Gut and liver. 2016;10:526.
16. Mohammad AN, Morsy KH. Scoring Systems and Risk Stratification in Cirrhotic Patients with Acute Variceal Bleeding" Scoring in Variceal Bleeding. J Liver. 2016;5:2167-0889.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 18-03-2019; **Accepted:** 10-04-2019; **Published:** 17-05-2019