Aswan University Medical Journal volume 2 / No.2/ December 2022 (44-57) Online ISSN: **2735-3117**

ORIGINAL ARTICLE

AIMS 65 Score Versus Glasgow Blatchford Score to Predict Outcomes of Upper GI Bleeding in Aswan University Hospital

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ABSTRACT

Keywords: Upper Gastrointestinal Bleeding, AIMS65, Glasgow Blatchford Scale, melena

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Background; Upper gastrointestinal bleeding (UGIB) is the most common cause of emergencies admission in gastrointestinal disease. UGIB could accompany with adverse events if not treated timely. Different scoring systems have been suggested for diagnosing these patients, **Aim and objectives;** to compare the predictive value of the AIMS65 with the **Glasgow Blatchford Scale** (GBS) score for a large scale of UGIB patients attending Aswan University Hospital, **Subjects and methods;** A cross sectional study, was carried out on patients presented with upper gastrointestinal bleeding in Aswan University Hospital, through a period of six months from July 2020 to December 2020. Seventy-three patients were enrolled **Result;** Mean age of patients was 43.45 years and 33 (45.2%) patients were 40-60 years old. Majority (69.6%) of patients was males. Forty-seven (64.4%) patients present with melena. It was found that AIMS65 and GBS score were significantly higher among those who were admitted to intensive care unit (ICU) and those who were died. AIMS65 had 60% sensitivity and 64.15% specificity for prediction of ICU's and 55.56% sensitivity and 59.38% specificity for prediction of mortality while GBS had 55% sensitivity and 90.57% specificity for prediction of ICU's and 77.78% sensitivity and 93.75% specificity for prediction of mortality **Conclusion;** GBS was superior to AIMS65 score in prediction of ICU admission and mortality.

INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB) is one of the common medical emergencies that may present with haematemesis, melena, and/or hemodynamic instability. The incidence of UGIB is between 84 and 160 cases per 100000 adults in European populations, with incidence highest in men, in lower socioeconomic group's elderly [1, 2].

Peptic bleeding is the commonest identified cause, though its incidence is

declining - possibly due to the use of proton pump inhibitors and the decreasing prevalence of Helicobacter pylori infection. By contrast the relative contribution of variceal bleeding appears to be rising, accounting for 1% of all UGIB in the national audit. Mortality in the successive national audits has appeared to fall from 14% to 10% [3].

Accurate risk assessment for triaging and. prognostication is extremely important. Accurate risk stratification will enable urgent endoscopy and intensive care monitoring for high-risk patients and facilitate discharge of low-risk patients from emergency care units. Various risk-scoring systems have been used to predict outcomes in patients UGIB [4].

In order to stratify the risk of complications, re-bleeding, need of clinical intervention or death, several clinical scores are in use. Although recommended in the prevailing guidelines, they are erratically applied in the clinical practice [5].

A recently proposed scoring system, AIMS65, was found to be a simple, accurate risk score to predict in-hospital mortality, length of hospital stay, and health care costs in patients with acute UGIB. The AIMS65 consists of the following components: albumin level < 3.0 g/dl (A), International normalized ration INR > 1.5 (I), altered mental status (M), systolic blood pressure 1-90 mm Hg (S), and age > 65 years. When more than two components of the AIMS65 are present, the mortality is considered to be high [6].

AIM OF THE WORK

We designed this work to compare the predictive value of the AIMS65 with the Glasgow Blatchford Score (GBS) for a large scale of UGIB patients attending Aswan UniversityHospital.

PATIENTS& METHODS

Informed consent was obtained from all patients after being informed about the aims and process of the study as well as applicable objectives. The study was performed in accordance with the Declaration of Helsinki on medical protocol and ethics. It was approved by Institutional Review Board, Faculty of Medicine of Aswan University.

Study setting& design

A cross sectional study that was performed in Aswan university hospital in period between July 2020 to December2020

Inclusion criteria

- Adult patients aged more than 18 years old.
- Both sexes
- Patients with acute UGIB

Exclusion criteria

A patient with one or more of the following was excluded;

- Iatrogenic post-procedural bleedings after endoscopic resection for gastric tumors.
- Missing data required for calculation of relevant riskstratification scores.

Methodology

1. ***Semi-structured interview questionnaire which includes***

Socio-demographic factors: age, sex, marital status, occupational categories, and history of chronic diseases. Upper gastrointestinal bleeding risk factors: previous history of upper gastrointestinal bleeding, history of anticoagulants, antiplatelets intake, history of chronic disease as kidney disease ischemic heart disease and stroke. History of liver disease: jaundice, fever, lower limb edema deterioration of conscious level.

2. ***Specimen collection***

Blood samples was taken for analysis like complete blood count, urea and creatinine, International Normalized Ration (INR). Liver function test, sodium, potassium and electrolytes.

3. ***Score Assessment***

AIMS65 scores was calculated by allotting I point each for albumin < 3 (g/dl), INR ≥ I .5 alterations in mental status, Alteration in systolic blood pressure < 90 mmHg and age ≥ 65 years old **(Table 1).** The Blatchford score was calculated from eight clinical or laboratory variables (heart rate, hemoglobin value, blood urea nitrogen, systolic blood pressure, melena occurrence, syncope, hepatic disease or heart failure) **(Table 2).**

If all the current parameters were within the limits, the total score would be zero. The risk of an acute upper gastrointestinal bleed would be less than 1.8 % (low risk), these patients were effectively treated in an outpatient setting, with higher scores indicating higher likelihood of a need for an endoscopic intervention.

Study Outcomes

The study's outcomes included hospital stay, ICU admission, and mortality rate. Blood transfusion, and surgery, as well as the incidence of re-bleeding and duration of hospital and ICU Stay.

Follow up

The included patients were followed during their hospital stay and one month after discharge.

Statistical analysis

All statistics were performed using SPSS version 23. Continuous data such as age and weight was presented as mean ± SD or median and interquartile range. Qualitative variables such as sex was expressed as percentages.

Analysis of continuous data with normal distribution was analyzed by student t test and non- normally distributed data by Mann-Whitney U test. Categorical data was

analyzed by chi-square test and Fischer exact where applicable. Accuracy of AIMS65 and GBC for prediction of mortality and ICUs' admission was determined by receiver operative characteristics (ROC) curve. P value of < 0.05 was defined as statistically significant.

RESULTS

Baseline and clinical data of studied patients (table 3):

Mean age of patients was 43.45 years and 33 (45.2%) patients were 40-60 years old. Majority (69.6%) of patients was males. Forty-seven (64.4%) patients present with melena. Eight and 23 (31.2%) patients had history of anticoagulants and non-steroidal anti-inflammatory usage, respectively. Other baseline and clinical data are summarized at table 3

Baseline laboratory investigations among studied patients (table 4):

It was found that 6 (8.2%), 17 (23.3%), 18 (24.7%), and 32 (43.8%) patients had hemoglobin level > 12, 9-12, 7-9, and < 7 g/l, respectively. Other data are summarized at table 4.

Outcome among the studied patients (table 5):

It was found that 47 (64.4%) patients required blood transfusion. Mean duration of hospital stay 3.14 with range (1-5 day). Twenty (27.4%) patients required intensive care unit (ICU) admission. Fourteen patients suffered from rebreeding.

AIMS65 score according to blood transfusion, hospital stay, ICU admission and outcome (table 6):

It was found that AIMS65 score was significantly higher among those who were admitted to ICU and those who were died.

Glasgow-Blatchford Bleeding score according to blood transfusion, hospital stay, ICU admission and outcome (table 7):

It was found that GBS score was significantly higher among those who were admitted to ICU and those who were died.

Accuracy of AIMS65 and GBC for prediction of mortality and ICUs' admission (table 8, Figure 1-2):

At cut off point > 1, AIMS65 had 60% sensitivity and 64.15% specificity for prediction of ICU's with area under curve (AUC) was 0.68 while at cut off point > 1, AIMS65 had 55.56% sensitivity and 59.38% specificity for prediction of mortality with AUC was 0.62.

At cut off point > 13, GBS had 55% sensitivity and 90.57% specificity for prediction of ICU's with AUC was 0.76 while at cut off point > 14, GBS had 77.78% sensitivity and 93.75% specificity for prediction of mortality with AUC was 0.92.

DISCUSSION

UGIB associated mortality varies from 2% to 15%, and rebleeding can occur in 10% to 30% of patients. The optimal identification of high-risk patients can help in determining the appropriate individuals for early endoscopic intervention or intensive treatment in these patients [7].

An effective risk assessment for the UGIB is important for determining the treatment plans. Glasgow Blatchford Score (GBS) and Rockall score have been recommended as suitable tools for predicting the need for clinical intervention in patients with non-variance UGIBs [7].

The aim of this study is to compare the predictive value of the AIMS65 with the GBS score for a large scale of UGIB patients attending Aswan University Hospital.

In this study we showed that there was 69.1% male, 13.7% aged below 40, 45.2% between 40-60 and 41.4% more than 60. Similar to our work **Hajavi et al.** showed that most patients were male [8]. **Hyett et al.** also showed that 54% of patients in his study were male [9].

In our study we found that there was 2.7% with hepatic disease, 4.1% with heart failure, 64.4% with melena, 17.8% with melena and syncope, 19.2% with History of upper GI bleeding, 31.5% with NSAIDS, and 11% was using Anticoagulant.

Hajavi et al. showed that Urgent endoscopy was performed in 68 cases, of them 64.1% was presented with melena [8] also, **Hyett et al.** showed that 63.3% with melena [9].

In this study we illustrated that there was 11% with CKD, 13.7% IHD, 32.9% DM, 8.2% ESDR, 39.7% HTN, and 2.7% Hepatic disease symptoms. Similar to our work **Hajavi et al.** showed that 3.9% of patients in his study were with hepatic disease [8]. **Hyett et al.** also showed that 3.2% of his cases had liver disease, 16.5% with myocardial infarction, 7.6% with renal disease [9].

In this study we showed that 34.2% with less than 90 systolic blood pressures, 27.4% with 90-100, 11% with 100-120, 27.4% more than 120, 12.3% were Unconscious, 87.7% were conscious, 54.8% with pulse rate less than 100, 45.2% 60-80. **Hyett et al.** showed that Systolic blood pressure was 112 (93-133), pulse was 91 (76-108), Syncope 33 (11.9%) [9]. **Hajavi et al.** showed that Systolic Blood pressure was (mmHg) 109.64 (65-150), Heart rate was 87.32 (67-130) [8].

In this study we reported that there was 64.4% with blood transfusion, the mean units of blood transfusion 3.15 (± 1.73 SD) with range (1-7), 67.1% with hospital stay, the mean Duration of hospital stay 3.14 (± 1.00 SD) with range (1-5), 27.4% with ICU admission 2.7% with 1 rebleeding, 9.6% with 2 re-bleeding, 6.8% with 3 re-bleeding, 12,3% died

Hajavi et al. showed that Patients were admitted for mean of 4.84± 2.08 days (range 1-15 days) [8]. In hospital outcome were as follows: rebleeding in 23 patients

(15%), need for transfusion in 68 patients (44.4%), failed endoscopy in 5 patients (3.3%), re-endoscopy in 46 patients (30.1%), Embolization and need for surgery each in 5 cases (3.3%). Eight patients (5.2%) died during the hospital stay.

In this study we showed that AIMS65 score according to ICU admission, sensitivity was 60%, specificity was 64.15%, AUC 0.683. GBS score according to ICU admission, sensitivity was 55 %, and specificity was 90.57%, AUC 0.766. **Amr et al.** showed that AMS65 score had highest diagnostic performance and characteristics in prediction of ICU admission in hospital followed by Blatchford [10].

Hajavi et al. showed that Sensitivity and specificity of the AIMS65>2 in predicting in-hospital mortality was 87.5% and 100%, respectively and for GBS>12 was 62.50% and 92.41%, respectively. AIMS65 had significantly higher sensitivity and specificity. For predicting need for transfusion, the sensitivity and specificity of AIMS65>1 was 100% and 64.71%and for GBS>8 was 88.24% and 88.91%, respectively [8].

GBS had better sensitivity and specificity for predicting need for transfusion. AIMS65>1 and GBS>7 had sensitivity of 35.29% and 63.24% and specificity of 80% and 51.76%, respectively. with changing the AIMS 65 between 1 and 2 or GBS between 8 and 12, the specificity of the test were significantly reduced for evaluated outcomes [8].

This study showed that AIMS65 score according to mortality, sensitivity 55.56%, specificity 59.38%, and AUC 0.620. GBS score according to mortality; sensitivity 77.78 specificity 93.75%, and AUC 0.921. **Amr et al.** showed that AMS65 score had highest diagnostic performance and characteristics in prediction of death in hospital, followed by Blatchford [10].

Our study has some limitation; A small sample size of patients can be one of the limitations, so we recommend conducting studies with larger sample size. On the other hand, the cross-sectional study is another limitation of the study.

CONCLUSION

UGIB is one of the most clinical emergency facing the clinicians. Appropriate evaluation of those patients will greatly reflect on their management plan and outcome. GBS is superior to AMIS65 in assessment of such cases. Future study with large sample size are required.

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Table 1: AIMS 65 Score

Variable	Score
Albumin < 3 g/dl	1
International normalized ratio >1.5	1
Systolic blood pressure < 90 mmHg	1
Altered mental status	1
Age ≥ 65 year	1

AIMS: albumin, International normalized ratio, mental status, Systolic blood pressure

Table 2: Glasgow Blatchford score

Variable	Score
Blood urea (mmol/L)	
6.5 - 8	2
8 - 10	3
10 - 25	4
> 25	6
Hemoglobin(g/L) for men	
120 - 130	1
100 - 120	3
100	6
Hemoglobin (g/L) for women	
100-120	1
< 100	6
Systolic blood pressure (mmHg)	
100-109	1
90 - 99	2
< 90	3
Pulse ≥ 100/min	1
History and comorbidities	
Melena	1
Syncope	2
Hepatic disease	2
Cardiac failure	2

Table 3: Baseline and clinical data of studied patients

Personal data	**No. (73)**	**%**
Sex:		
Male	51	69.9%
Female	22	30.1%
Age: mean (SD)		43.45 (12.34)
< 40	10	13.7%
40-60	33	45.2%
> 60	30	41.1%
History of		

Melena	47	64.4%
Melena & Syncope	13	17.8%
History of upper GI bleeding:	14	19.2%
History of drugs intake:		
No	42	57.5%
NSAIDS	23	31.5%
Anticoagulant	8	11.0%
History of chronic diseases		
Hepatic disease	2	2.7%
Ischaemic heart disease	10	13.7%
Diabetes mellitus	24	32.9%
End stage renal disease	6	8.2%
Hypertension	29	39.7%
Hepatic disease symptoms	2	2.7%
Systolic blood pressure:		
< 90	25	34.2%
90-100	20	27.4%
100-120	8	11.0%
> 120	20	27.4%
Mental status:		
Unconscious	9	12.3%
Conscious	64	87.7%
Pulse (beat/minute):		
> 100	40	54.8%
60-100	33	45.2%
< 60	0	0.0%

Data expressed as mean (SD), frequency (percentage). NSAIDS: non-steroidal anti-inflammatory drugs; GI: gastrointestinal

Table 4: Baseline laboratory investigations among studied patients

Lab investigations	**No. (73)**	**%**
Hemoglobin (g/L)		
> 12	6	8.2%
9-12	17	23.3%
7-9	18	24.7%
< 7	32	43.8%
Blood urea: (mg/dL)		
< 20	4	5.5%
20-40	17	23.3%
> 40	52	71.2%
Creatinine: (mg/dL)		
< 0.5	3	4.1%
0.5-1.1	26	35.6%

> 1.1	44	60.3%
Serum albumin: (g/dl)		
> 3.5	24	32.9%
3.0 - 3.5	26	35.6%
2.5-3.0	12	16.4%
< 2.5	11	15.1%
International randomized ratio		
< 0.9	0	0.0%
0.9-1.2	43	58.9%
> 1.2	30	41.1%
Aspartate transaminase (u/l)		
Normal	39	53.4%
One fold	34	46.6%
Two folds	0	0.0%
Three folds	0	0.0%
Alanine transaminase (u/l)		
Normal	59	80.8%
One fold	14	19.2%
Two folds	0	0.0%
Three folds	0	0.0%
Sodium (mmol/l)		
< 134	24	32.9%
134-144	39	53.4%
> 144	10	13.7%
Potassium (mg/dl)		
< 3.6	20	27.4%
3.6-5.0	50	68.5%
> 5	3	4.1%

Data expressed as frequency (percentage)

Table 5: Outcome among the studied patients

Outcome	No. (73)	%
Blood transfusion:		
Yes	47	64.4%
No	26	35.6%
Units of blood transfusion:		
Mean ± SD	3.15 ± 1.73	
Range	1.0 – 7.0	
Hospital stay:		
Yes	49	67.1%
No	24	32.9%
Duration of hospital stay:		
Mean ± SD	3.14 ± 1.00	
Range	1.0 – 5.0	

ICU admission:		
Yes	20	27.4%
No	53	72.6%
Duration of ICU admission:		
Mean ± SD	2.10 ± 1.02	
Range	1.0 – 4.0	
Surgery:		
Yes	0	0.0%
No	73	100.0%
Number of re-bleeding:		
0	59	80.8%
1	2	2.7%
2	7	9.6%
3	5	6.8%
Outcome:		
Died	9	12.3%
Alive	64	87.7%

Data expressed as mean (SD), frequency (percentage). ICU: intensive care unit

Table 6: AIMS65 score based on blood transfusion, hospital stay, ICU admission and outcome

	AIMS65 score		**P-value**
	Mean ± SD	**Median (Range)**	
Blood transfusion:			
Yes	1.38 ± 1.07	1.0 (0.0-4.0)	0.664
No	1.50 ± 1.14	2.0 (0.0-3.0)	
Hospital stay:			
Yes	1.33 ± 1.09	1.0 (0.0-4.0)	0.276
No	1.62 ± 1.10	2.0 (0.0-3.0)	
ICU admission:			
Yes	1.95 ± 1.00	2.0 (1.0-4.0)	0.011*
No	1.23 ± 1.07	1.0 (0.0-3.0)	
Outcome:			
Died	1.78 ± 0.83	2.0 (1.0-3.0)	0.033*
Alive	1.38 ± 1.12	1.0 (0.0-4.0)	

Data expressed as mean (SD). *P* value was significant if < 0.05. ICU: intensive care unit; AIMS: albumin, International normalized ratio, mental status, Systolic blood pressure

Table 7: Glasgow-Blatchford Bleeding score according to blood transfusion, hospital stay, ICU admission and outcome

	GBS score		**P-value**
	Mean ± SD	**Range**	

Blood transfusion:			
Yes	11.19 ± 3.24	5.0-16.0	0.602
No	10.77 ± 3.40	5.0-16.0	
Hospital stay:			
Yes	10.98 ± 3.34	5.0-16.0	0.821
No	11.17 ± 3.23	5.0-16.0	
ICU admission:			
Yes	12.85 ± 3.17	6.0-16.0	0.003*
No	10.36 ± 3.08	5.0-16.0	
Outcome:			
Died	14.78 ± 1.09	13.0-16.0	0.000*
Alive	10.52 ± 3.14	5.0-16.0	

Data expressed as mean (SD). *P* value was significant if < 0.05. ICU: intensive care unit; GBS: Glasgow-Blatchford Bleeding score

Table 8: Accuracy of AIMS65 and GBC for prediction of mortality and ICUs' admission

	Cut-off	**Sensitivity**	**Specificity**	**+PV**	**-PV**	**AUC**
AIMS65	> 1	60	64.15	38.7	81	0.68
	> 1	55.56	59.38	16.1	90.5	0.62
GBS	> 13	55	90.57	68.7	84.2	0.76
	> 14	77.78	93.75	63.6	96.8	0.92

AIMS: albumin, International normalized ratio, mental status, Systolic blood pressure; GBS: Glasgow-Blatchford Bleeding score; +PV: positive predictive value; -PV: negative predictive value; AUC: area under curve

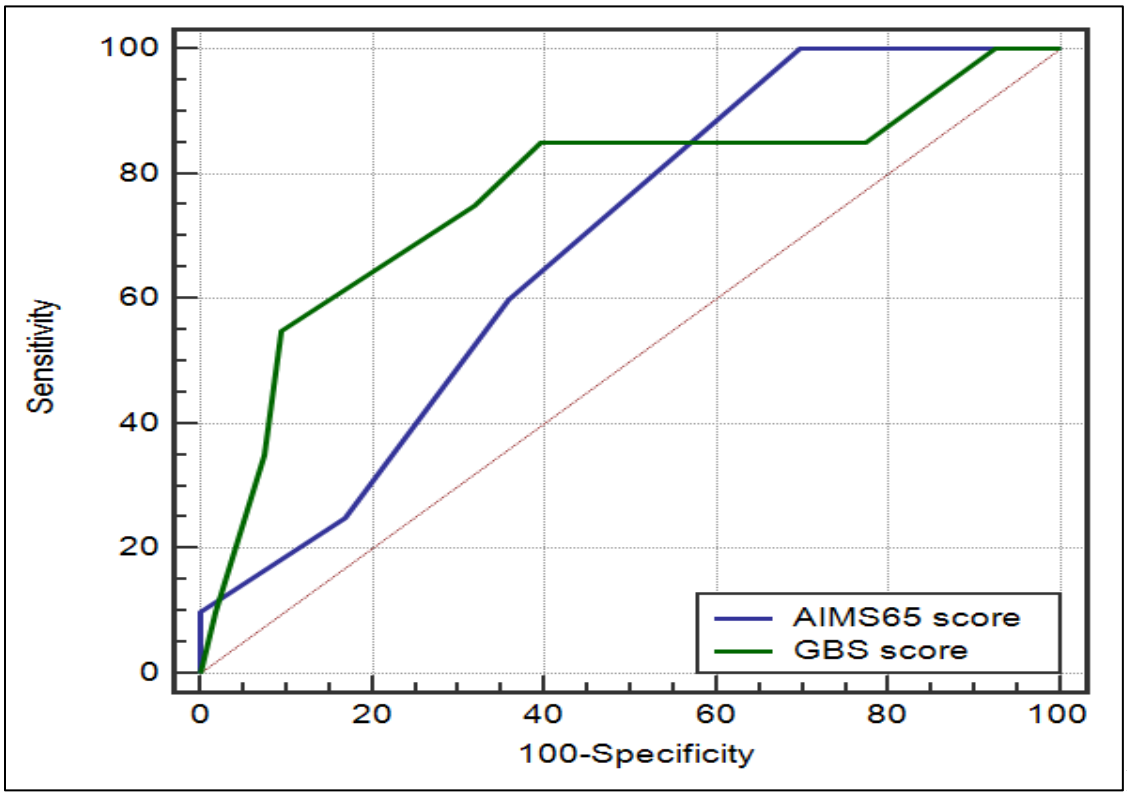

Figure 1: ROC curve for AIMS65 score and GBS score for prediction of ICU admission

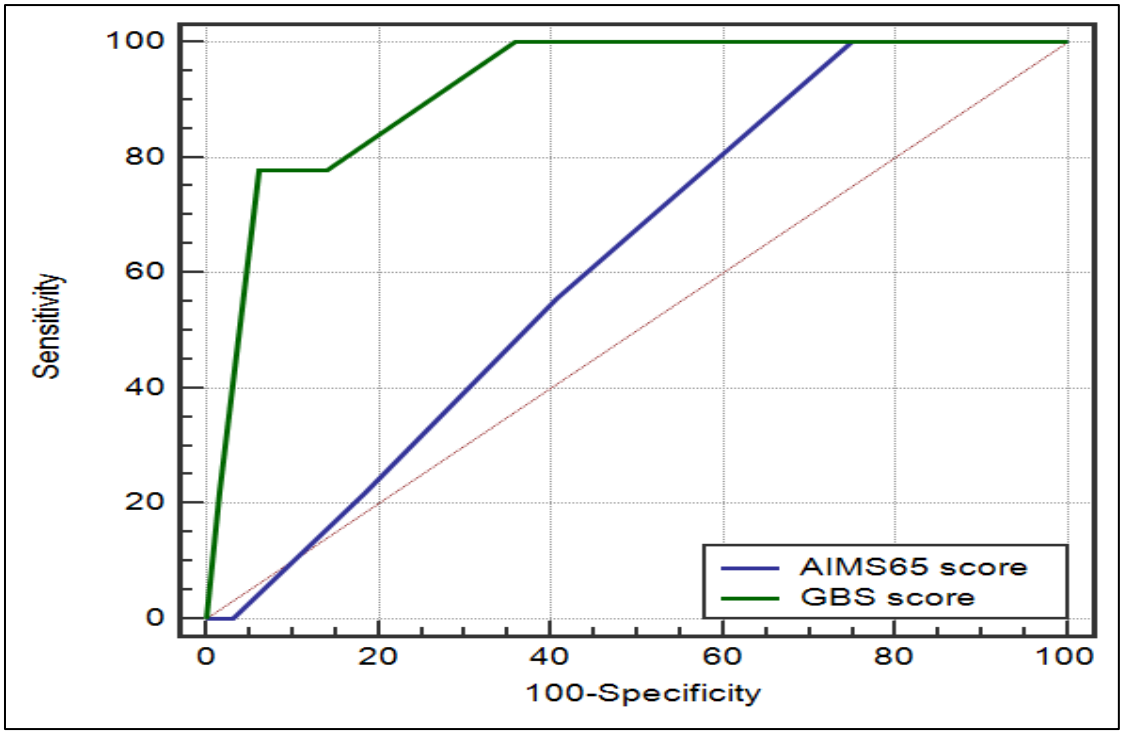

Figure 2: ROC curve for AIMS65 score and GBS score for prediction of mortality