Validation of the Usefulness of Two Risk Scoring Systems for Predicting Mortality due to Upper Gastrointestinal Bleeding in a Major Johannesburg Hospital

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Introduction

- Upper gastrointestinal bleeding is a common medical emergency and peptic ulcer disease accounts for 50-60% of the cases ***(Kim et al., 2019).***

- Priorities during evaluation of a patient with GIT bleeding include haemodynamic stability, need of blood transfusion and timing of endoscopy ***(Sverden et al., 2018).***

- The two main concerns during treatment are risk of re-bleeding and mortality ***(Kita et al., 2020).***

- The Rockall Classification and Glasgow-Blatchford score are the commonly used risk stratification systems for mortality ***(Choi et al., 2023).***

Complete Rockall Classification *(Rockall et al., 1996)* **and Glasgow-Blatchford Classification** (*Blatchford et al. 2000*)

Parameter	Categories	Weighting
Age	<60 years 60-79 years >79 years	0 1 2
Shock	No shock Tachycardia Hypotension	0 1 2
Co-morbidity	No Major like CCF, IHD CKD, CLD or cancer	0 2 3
Endoscopic diagnosis	None or Mallory-Weiss PUD, erosions or oesophagitis. Cancer	0 1 2
Forrest class	2c or 3 1a, 1b, 2a or 2b.	0 2

Parameter	Categories	Weighting
Blood urea	6.5-7.9, 8.0-9.9, 10.0-24.9 and >24.9	2, 3, 4 and 6
Haemoglobin	<10g/dl -13g/dl	6, 3 and 1
Systolic BP	<90, 90-99 and 100-109mmHg	3, 2 and 1.
Heart rate	>100/min	1
Melena	Present	1
Syncope	Present	2
Hepatic disease	Present	2
Cardiac failure	Present	2

Materials and Methods

- This was a retrospective observational study of records of patients 18 years and older who presented to CMJAH with upper GIT bleeding between 1 January 2016 and 31 December 2020.
- Research Electronic Data Capture (REDCap) records and discharge summaries of patients admitted and managed by the Department of Surgery were reviewed.
- Data retrieved included demographic details, vital parameters on presentation, co-morbidities as per CRS and GBS, initial laboratory test results, endoscopic findings and outcomes.
- The outcome of interest was in-hospital mortality and whether the CRS and GBS were significant predictors of outcome in our patient population.
- Permission to conduct the study was received from the local ethics committee (**M210951**) and the hospital authorities.

Data analysis

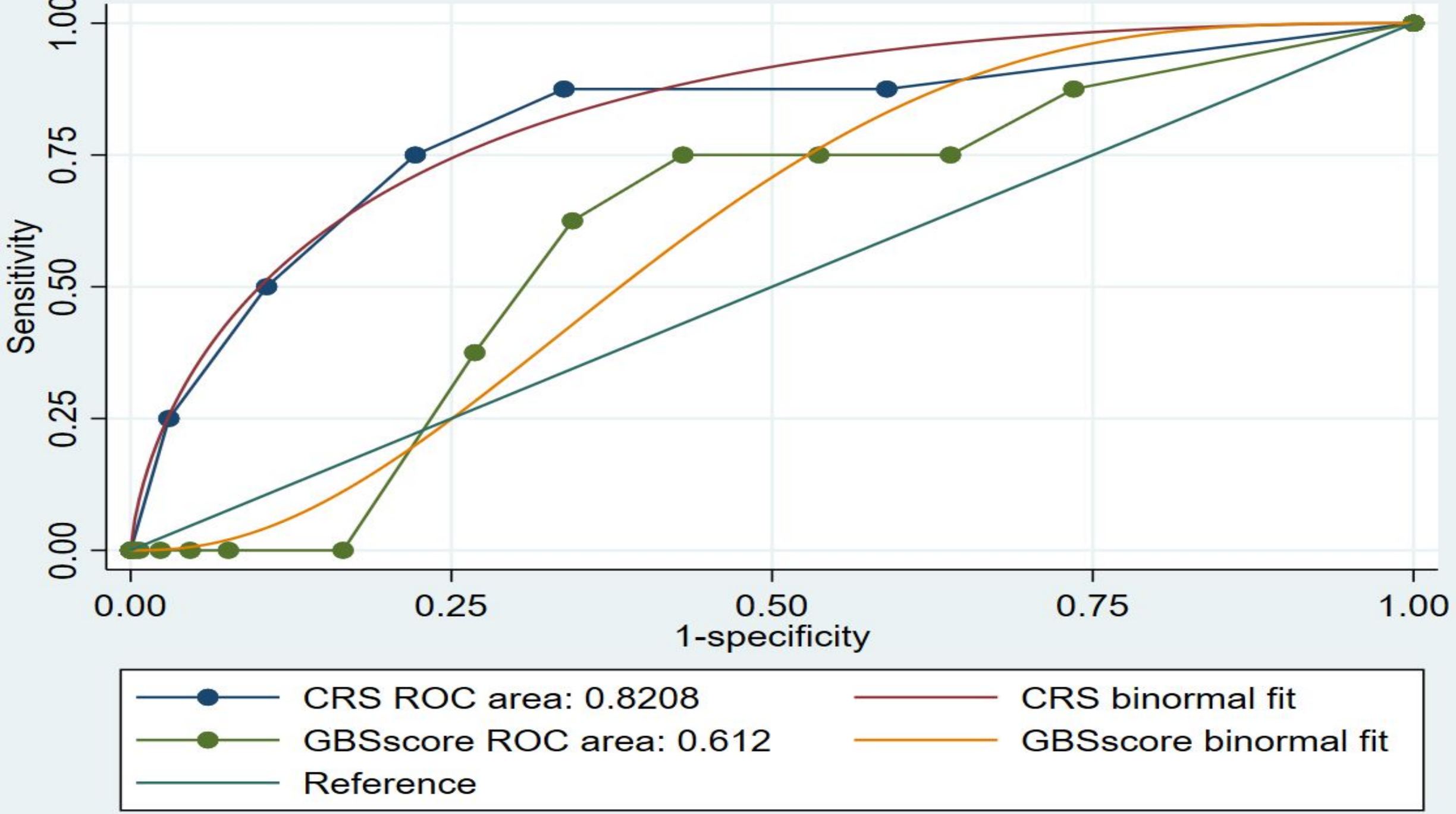
- StataSE version 17.0 was used to analyze the data.
- The chi-square test or Fisher's exact test was used to compare categorical findings.
- Sample means, and medians were compared using the two-sided independent t-test or Mann-Whitney U test, respectively, dependent on the sample size.
- Multivariate logistic regression was used to determine the variables that were strongly associated with mortality.
- A confidence interval (CI) of 95% was used, and statistical significance was set at a p-value below 0.05.

Variable (N = 516)	Category	Frequency (n)
Gender	Male	337 (65.2%)
	Female	179 (34.5%)
Age	< 60	350 (67.7%)
	≥ 60	167 (32.3%)
Rockall classification co-morbidities	None	285 (55.1%)
	Minor	203 (39.3%)
	Major	29 (5.6%)
Glasgow-Blatchford co-morbidities	None/ unknown	217 (42.0%)
	Melaena	240 (46.4%)
	Other	22 (4.3%)
HIV status	Positive	61 (11.8%)
	Negative	236 (45.6%)
	Unknown	218 (42.3%)

Endoscopic finding (n = 363)	Frequency (n)	Actual percentage	Cumulative percentages
Peptic ulcer	268	73.8%	73.8%
Gastritis	32	8.8%	82.6%
Varices	32	8.8%	91.4%
Oesophagitis	12	3.3%	94.7%
Duodenitis	7	1.9%	96.6%
Dieulafoy lesion	5	1.4%	98.0%
Tumours	4	1.1%	99.1%
Other	3	0.8%	100%

Parameter		Frequency (n/%)		
		Survivors	Non-survivors	p-value
Age	< 60 years	344 (69%)	6 (33%)	0.002
	≥ 60 years	155 (31%)	12 (67%)	
Heart rate	< 100/min	225 (45%)	5 (31%)	0.273
	≥ 100/min	274 (55%)	11 (69%)	
Systolic blood pressure	< 100mmHg	69 (14%)	7 (41%)	0.002
	≥ 100mmHg	430 (86%)	10 (59%)	
Haemoglobin	<10g/dl	290 (58%)	13 (72%)	0.236
	≥10g/dl	208 (42%)	5 (28%)	
Gender	Male	326 (65%)	11 (61%)	0.703
	Female	172 (35%)	7 (39%)	
Cardiac or hepatic disease	Present	21 (4%)	1 (0.06%)	0.781
	Absent	478 (96%)	17 (94.4%)	
HIV status	Positive	57 (11%)	4 (22%)	0.383
	Negative	229 (46%)	7 (39%)	
	Unknown	211 (43%)	7 (39%)	

Variable	Odds ratio	SEM	z	P > |z|	95% CI
Age	1.00	0.21	0.45	0.652	0.968 - 1.052
Heart rate	1.98	1.24	1.09	0.274	0.581 - 6.752
Systolic blood pressure	0.96	0.01	-2.09	0.036	0.932 - 0.998
Hepatic disease	0.14	0.19	-1.45	0.147	0.103 - 1.976
HIV status	0.63	0.26	-1.10	0.272	0.282 - 1.428
Haemoglobin	1.88	0.74	1.61	0.108	0.870 - 4.073
Urea	1.87	0.75	1.58	0.115	0.858 - 4.091
CRS	1.70	0.30	2.99	0.003	1.201 - 2.408
GBS	0.55	0.19	-1.71	0.087	0.277 - 1.091


Sensitivity
0.00
0.25
0.50
0.75
1.00
1-specificity
0.00
0.25
0.50
0.75
1.00
CRS ROC area: 0.8208
GBSscore ROC area: 0.612
Reference
CRS binormal fit
GBSscore binormal fit

Limitation

- The study was retrospective and some records were incomplete.
- Not all patients had their HIV status recorded and whether the patients who were HIV positive were on treatment with anti-retroviral drugs was not specified.
- Our hospital is referral hospital and majority of patients are transferred after resuscitation have been started.
- Some of the patients in the study might not have received appropriate treatment such as admission to an intensive unit and timeous endoscopic or surgical intervention due to limitation of resources, which would have contributed to the mortality.

Conclusion

- Close to 70% (68%) of patients presenting with upper GIT bleeding in our setting are below the age of 60 years.
- Peptic ulcer disease is the commonest cause (74%) of upper GIT bleeding and majority occur in males.
- The overall mortality in patients with upper GIT bleeding is 3.5% and was strongly associated with age above 60 years and a CRS above 5 but not the HIV status.
- The CRS rather than GBS should be used for risk stratification of mortality for patients presenting with upper GIT bleeding in South Africa.

- Thank you.