UDC 61

SCORING SYSTEM COMPARISON TO DETERMINE SEVERITY IN NON-VARICEAL UPPER GASTROINTESTINAL BLEEDING

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ABSTRACT
Determining scoring values in cases of UGIB is important to do so it can be used as a basis to determine the mortality rate of UGIB patients. Despite the dependency of most risk scoring systems for this disorder on endoscopic findings, the Glasgow-Blatchford Bleeding Score (GBS) and Incomplete Rockall Score (IRS) are based on simple variables. Our purpose to differentiate about sensitivity and spesificity between IRS and GBS to predict the severity of patient with non variceal upper GI bleeding without the endoscopic score. Our study was undertaken in emergency department Saiful Anwar hospital, Malang. The sample consist of 102 patients with non variceal upper GI bleeding from November 2012 to April 2013. With receiving-operator characteristics (ROC), we compare the significance between IRS and GBS in predicting the severity of patient with non variceal upper GI bleeding. In next step, we compare both of them with the diagnostic test. ROC curve shows that GBS is slightly better than IRS (0,955 vs 0,744, $p<0,05$). IRS has better specificity (79,55% vs 70,45%) than GBS. But, GBS has better sensitivity (96,55% vs 65,52%). The final results is GBS as an alternative diagnostic score has better results than IRS in understanding the severity of patient with non variceal upper GI bleeding in Saiful Anwar hospital. Therefore, it can be used as a simple predictor replacing the endoscopic score.

KEY WORDS
Non variceal-UGIB, bleeding, emergency.

Acute upper gastrointestinal bleeding is one of the most common emergency cases found in emergency departments or in primary health care since 1960. In Scotland, it accounts for up to 7000 cases per year in emergency units. In the UK, the mortality rate is reported to be 7% in 2007. In West Scotland, the incidence is reported to be higher compared to the other states which are 170 per 100000 persons with a mortality rate of 8,2%. In the US, the incidence is up to 165 cases per 100000 persons with a mortality rate of 7-10% per year. In Hong Kong, there are up to 3220 admitted cases from 1993-2003 with a mortality rate of 6-8% [1-3].

In Indonesia, the data extracted from medical records of patients admitted in Internal Medicine department of Hasan Sadikin Hospital Bandung in 1996-1998 found that 2,5-3,5% of the patients is admitted for UGIB. The most common cause of UGIB in Indonesia is rupture of gastroesophageal varices (50-60%) followed by hemorrhagic erosive gastritis (25-30%), peptic ulcer (10-15%), and other causes (< 5%), unlike in western countries where the most common cause of UGIB is peptic ulcer. A recent study shows the tendency of GI bleeding caused by consumption of rheumatic herbal treatments as the most frequent cause of UGIB in the emergency department of Hasan Sadikin Hospital Bandung. The data from

2008 shows 733 patients (2%) out of 35.965 patients came to RSSA with complaints of hematemesis, melena, or both. From endoscopy results, 40% has erosive gastritis, 11% has erythematous gastritis, 18% has gastric ulcers, 5% has duodenal ulcers, 13% has esophageal varices, and 13% has other conditions. Overall mortality rate is still high at about 25%. The mortality rate in patients with ruptured esophageal varices is up to 60%, while mortality rate in patients with nonvariceal hemorrhage is about 9-12%. Most of the UGIB patients died not because of the bleeding itself, but because of the other comorbidities, such as chronic kidney disease, stroke, cardiac problems, chronic liver disease, pneumonia, and sepsis. In Saiful Anwar Hospital Malang, from January – June 2013, there were 124 patients admitted with UGIB and underwent endoscopy procedure, with the result that 60% of them had nonvariceal UGIB. [4,5].

Accurate early predictor is necessary to determine the prognosis. Most of the patients with UGIB seek medical treatment for the first time in the ER and treated by general practitioners [6,7]. GPs have an important role in evaluating and resuscitating patients, managing and determining the next steps to reduce the symptoms and the mortality rate. According to existing study, western countries have perused several scoring systems in evaluating the prognosis of UGIB patients such as Glasgow Blatchford Scoring and Incomplete Rockall Scoring [1,2,8]. The difference between both scores only lies on their parameters. Rockall Score uses clinical parameters only, while Blatchford uses clinical parameters and laboratory values.

In Indonesia, there is neither any emergency room nor medical centers who have utilized the above scoring systems as an alternative to determining the prognosis of UGIB patients, partly because of the limited availability of endoscopy facilities. Although both scoring systems have their own strengths and weaknesses regarding the parameters used, their application is expected to be an alternative diagnostic measure that can help medical personnel, especially the ones who work in the ERs or primary care centers, to take actions for the UGIB patients that come to them.

METHODS OF RESEARCH

This retrospective study was conducted to compare the diagnostic value of Incomplete Rockall Score and Glasgow Blatchford Score in determining the severity of non-variceal upper gastrointestinal bleeding cases. The research was conducted in the Emergency Department and the Endoscopy Unit of Saiful Anwar General Hospital Malang between November 2012-April 2013. Endoscopic examination were conducted as early as 12-24 hours after the patient's admission and when the patient had been in stable condition.The proposal of this study had been approved by Ethical Committee of Saiful Anwar Hospital Malang with number 368/KEPK/XI/2012.

All patients that come to RSSA ED complaining of upper gastrointestinal bleeding, including hematemesis, coffee ground emesis, and melena. Inclusion criteria includes: 1) All patients with nonvariceal upper gastrointestinal bleeding with main complaint of hematemesis, coffee ground emesis, or melena, and coffee ground or black-colored fluid from NGT (not a patient with UGIB with endoscopic result of esophageal varices). 2). Patients that come to the ER, or admitted. 3) Patients who are willing to undergo endoscopy examination. 4). Age $\geq$ 15 years old, 5). Signing the informed consent.

All patients who came to Saiful Anwar Hospital ED and meet the inclusion and exclusion criteria would be scored using IRS and GBS. The patients are asked for informed consent first as a requirement to conduct further research. After that, the patients will undergo endoscopy as the gold standard in UGIB cases. Acquired data will be tested using Chi-square and independent t-test to evaluate the significance of the difference between each of the parameters used in GBS and IRS. Normality test is conducted before independent t-test. After that, the diagnostic test is conducted to evaluate sensitivity, specificity, positive predictive value, negative predictive value, and ROC curve test. The data is processed using SPSS 17 software for Windows.

RESULTS OF STUDY

Overall, from 102 patients with nonvariceal UGIB were enrolled in the research, there are more male 61 (59,8%) patients than woman 41 (40,2%). Most of them were less than 60 years old in age 66 (61,7%), but others 33 (32,3%) were 60-79 years old, and only (6) 4% more than 80 years old in age. Most of the patients came with hematemesis and melena 62 (60,7%), others came with coffee ground emesis 32 (31,3%), and melena 8 (7%).

From hemodynamic parameters, 85 (83,3%) patients had SBP of 100 mmHg or more and 17 (16,7%) patients had SBP < 100 mmHg. 49 patients (48%) had average heart rate of 80-100 beats per minute, 46 patients (45%) had average heart rate of more than 100 beats per minute, and 7 patients (7%) had average heart rate of less than 80 beats per minute. There were only 5 patients (4%) that had history of syncope. 22 patients (21,56%) were identified for having history of cardiac disease, 28 patients (27,45%) had history of liver disease, and 19 patients (18,62%) had history of renal disease.

Table 1 – Comparison Between Parameter of GBS

Parameter	GBS (n=102)		p-value
	High Risk	Low Risk	
SBP (mean ± SD)	113.28 ± 26.64 (n=69)	118 ± 18.039 (n=33)	0.298*
Hb (mean ± SD)	8.34 ± 2.42 (n=69)	11.49 ± 1.48 (n=33)	0.000*
BUN (mean ± SD)	31.99 ± 29.46 (n=69)	14.59 ± 8.91 (n=33)	0.000*
Heart Rate (mean ± SD)	104.38 ± 16.22 (n=69)	90.94 ± 19.50 (n=33)	0.001*
Melena n (%)			
- Negative	16 (23.19)	26 (75)	0.000**
- Positive	53 (76.81)	12 (25)	
Syncope n (%)			
- Negative	65 (94.2)	33 (100)	0.302***
- Positive	4 (5.8)	0 (0)	
Heart Disease n (%)			
- Negative	52 (75.36)	28 (84.85)	0.276**
- Positive	17 (24.64)	5 (15.15)	
Liver Disease n (%)			
- Negative	46 (66.67)	28 (84.85)	0.054**
- Positive	23 (33.33)	5 (15.15)	
Renal Disease n (%)			
- Negative	50 (72.46)	32 (96.97)	0.004**
- Positive	19 (27.54)	1 (3.03)	

*Note :*t-test independent, **Chi-Square, ***Fisher's Exact Test.*

Comparison of each parameter of GBS (table 1) using independent t-test yielded significant difference in average scores between high risk patient group and low risk patient group, especially hemoglobin, BUN, and heart rate ($p < 0,05$). However, average score of SBP was only insignificantly different between high risk patient group and low risk patient group. Using Chi-square, there was significant difference between both groups in regards of the incidence of melena and kidney disease as comorbidities ($p < 0,05$). There was no significant difference between both groups in regards of incidence of syncope, liver disease and heart disease as comorbidities ($p > 0,05$).

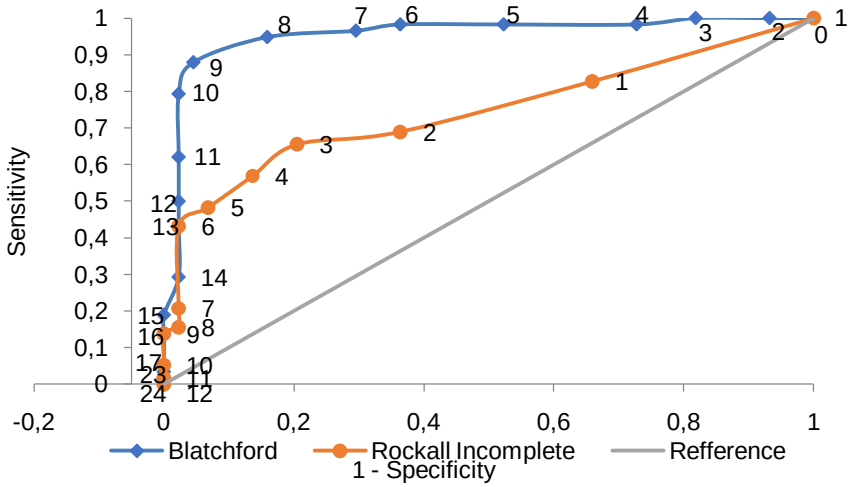
According to table 2 using independent t-test, there was no significant difference of average age and SBP between high-risk patients and low-risk patients ($p > 0,05$), but there was significant difference in average heart rate ($p < 0,05$). While using Chi-square, there was significant difference between incidence of heart disease, liver disease, and heart disease as comorbidities between both groups ($p < 0,05$). To determine the accuracy of IRS in diagnosing UGIB compared to GBS, an ROC curve was plotted (Picture 1).

According to Table 3 and Picture 1 above, in GBS, the result was 0,91-1,00 with p value < 0,05 and 95% CI. In IRS, the value was 0,65-0,84 with p value < 0,05 and 95% CI. P value of < 0,05 showed that either GBS or IRS could be used to determine the severity of UGIB. The area under operating curve for GBSis 0,955 and for IRS is 0,744. This showed that it is better to use GBS than IRS in determining the severity of UGIB.

Table 2 – Comparison between Parameter of IRS

Parameter	IRS (n=102)		p-value
	High Risk	Low Risk	
SBP (mean ± SD)	114.19 ± 32.50 (n=47)	115.3 ± 13.971 (n=55)	0.827*
Heart rate (mean ± SD)	102.64 ± 22.30 (n=47)	97.80 ± 14.02 (n=55)	0.007***
Age (mean ± SD)	55.00 ± 14.21 (n=47)	52.89 ± 13.66 (n=55)	0.447*
Heart Disease n (%)			
- Negative	31 (65.96)	49 (89.09)	0.005**
- Positive	16 (34)	6 (10.91)	
Liver Disease n (%)			
- Negative	22 (46.81)	52 (94.55)	0.000**
- Positive	25 (53.19)	3 (5.45)	
Renal Disease n (%)			
- Negative	28 (59.57)	54 (98.18)	0.000**
- Positive	19 (40.43)	1 (1.82)	

*Note:*t-test independent, **Chi-Square,***Mann-Whitney.*



Picture 1 – Curve Diagram ROC Comparison Between IRS and GBS

Further explanation of the ROC curve is detailed in the following table:

Table 3 – Final Result ROC Curve between IRS and GBS

Variable	Area	p-value	95% CI
GBS	0,955	0,000	0,91 – 1
IRS	0,744	0,000	0,65 - 0,84

Table 4 – Comparison Between IRS and GBS Using Endoscopy

IRS	Endoscopy		GBS	Endoscopy	
	High Risk	Low Risk		High Risk	Low Risk
High Risk	38	9	High Risk	56	13
Low Risk	20	35	Low Risk	2	31
Sensitivity	65,52%		Sensitivity	96,55%	
Specificity	79,55%		Specificity	70,45%	

Using Chi-square, there was a significant correlation between IRS and endoscopy result with $p < 0,05$. A significant correlation was also found between GBS and endoscopy result ($p < 0,05$). According to the data from Table 4 as seen above, utilization of IRS to determine the severity of UGIB had lower sensitivity compared to GBS, which is 65,52%. The specificity of IRS is higher than GBS at 79,55%. IRS had positive predictive value of 80,85% and negative predictive value of 63,64%. Utilization of GBS to determine the severity of UGIB

had higher sensitivity at 96,55% and quite high specificity at 70,45%. The positive predictive value was 81,16 and the negative predictive value was as high as 93,94%.

DISCUSSION OF RESULTS

According to the acquired result of the research, most of the patients in the sample population that came with nonvariceal UGIB were male (male: female 59,8%: 40,2% = 3:2). Based on the main complaints, 31,3% came with hematemesis compared to 7% that came with melena. 60,7% came with both hematemesis and melena as main complaints. In accordance to the existing references, the event of hematemesis and melena is proven to be the early manifestations of upper gastrointestinal bleeding, either variceal or nonvariceal, in which 30% of the patients with hemorrhagic ulcer had hematemesis, 20% had melena, and 50% had both (2,9). Based on the hemodynamic status, 83,3% patients of nonvariceal UGIB came with SBP of or more than 100 mmHg, and 48% came with heart rate of 80-100 times per minute. This proved that most of patients with nonvariceal UGIB that came to RSSA ER were hemodynamically stable.

In the statistical test to compare the parameters used in IRS, SBP and age didn't have significant difference between average scores in high-risk patients and low-risk patients ($p > 0,05$). From the data acquired, there was no significant difference in average value of SBP (average SBP of high-risk patients was 114 mmHg, average SBP of low-risk patients was 115 mmHg). Average age of high-risk patients was 55 years old and average age of low-risk patients was 52 years old. There was significant difference ($p < 0,05$) between both groups regarding the parameters of heart rate and existence of comorbidities such as heart disease, liver disease, and renal disease in nonvariceal UGIB patients that came to RSSA ER. The average heart rate of high-risk group was 102 bpm while it was 98 bpm in low-risk group. 34% (16 people) of nonvariceal UGIB patients had history of heart disease in high-risk group, while 10,91% (6 people) had it in low risk group. 65,96% (31 people) didn't have history of heart disease in high-risk group, while 89,09% (49 people) didn't have it in low-risk group. 53,19% (25 people) of nonvariceal UGIB patients had history of liver disease in high-risk group, while 5,45% (3 people) had it in low risk group. 46,81% (22 people) didn't have history of liver disease in high-risk group, while 94,55% (52 people) didn't have it in low-risk group. Regarding renal disease, 40,43% (19 people) of nonvariceal UGIB patients had it in high-risk group, while only 1,82% (1 person) had it in low risk group. 59,57% (28 people) didn't have history of renal disease in high-risk group, while 98,18% (54 people) didn't have it in low-risk group.

In the statistical test to compare each parameter in GBS, the parameters of Hb value, BUN, heart rate, melena, and history of renal disease all had significant difference ($p < 0,05$) of average scores between high-risk and low-risk group. Average Hb value in high-risk patients was 8 g/dL, while in low-risk patients it was 11 g/dL. Average value of BUN in high-risk group was 31,99 mg/dL and in low-risk group it was 14,59 mg/dL. Average heart rate in high-risk group was 104 bpm and in low-risk group it was 90 bpm. Regarding renal disease, 27,54% (19 people) of nonvariceal UGIB patients had it in high-risk group, while only 3,03% (1 person) had it in low risk group. 72,46% (50 people) didn't have history of renal disease in high-risk group, while 96,97% (32 people) didn't have it in low-risk group.76,81% (53 people) of nonvariceal UGIB patients had complained of melena in high-risk group, while 25% (12 people) had it in low risk group. 23,19% (16 people) didn't complain of melena in high-risk group, while 75% (26 people) didn't have it in low-risk group.

Parameters of GBS that didn't yield significant difference between high-risk and low-risk groups include history of syncope, heart disease, and liver disease. Average value of SBP between high-risk patients and low-risk patients was not significantly different (113 mmHg and 118 mmHg). Only 5,8% (4 people) of nonvariceal UGIB patients in high-risk group had history of syncope and 0% (0 person) had it in low-risk group. 94,2% (65 people) of high-risk patients didn't have history of syncope, while 100% (33 people) of low-risk patients didn't have it.Regarding heart disease, 24,64% (17 people) of nonvariceal UGIB patients had it in high-risk group, while only 15,15% (5 people) had it in low risk group.

75,36% (52 people) didn't have history of heart disease in high-risk group, while 84,85% (28 people) didn't have it in low-risk group. 33,33% (23 people) of nonvariceal UGIB patients had history of liver disease in high-risk group, while 15,15% (5 people) had it in low risk group. 66,67% (46 people) didn't have history of liver disease in high-risk group, while 84,85% (28 people) didn't have it in low-risk group.

According to the comparison of the parameters, there was no significant difference in average value of SBP between high-risk and low-risk group in either IRS or GBS ($p > 0,05$). This probably means that thenonvariceal UGIB patients that presented to RSSA ER was in stable condition and the bleeding was not as massive (hypovolemic shock grade 3) as in variceal UGIB patients (1,2).

Both scores have some other similar parameters including heart rate and kidney disease as comorbidity ($p < 0,05$). History of kidney disease was very significant ($p = 0,000$, $p < 0,05$) in worsening nonvariceal upper GI bleeding because too much uremic or ammonia content accumulated in the patient's body could aggravate the severity of symptoms in patients with history of gastritis, peptic ulcer disease, and ulceration of gastric mucosa in various stages. However, the mechanism that caused this is still unclear.Some studies suggested that uremia could disrupt platelet aggregation process (or hemostatic physiology), causing prolonged bleeding in nonvariceal UGIB patients with history of kidney disease (10,11). Presence of lesions in upper GI tract that could risk inducing UGIB in patients with kidney disease still couldn't be determined. Some researchers suggested that hypergastrinemia condition played a role in increasing the secretion of gastric acid which ended up creating lesions in GI tract, but other studies stated that hypergastrinemia caused hypochloride instead of increased acid secretions. Other studies stated that *H. pylori* played important role in increasing the prevalence of gastrointestinal lesions in patients with kidney failure. However, there was still controversy about whether the patients with kidney disease had increased risk of *H. pylori* infectioncompared to normal populations. A study stated that the prevalence of *H. pylori* infection is 49% - 66% in patients with kidney disease, and 35% - 75% in control group (5,10, 12).

Patients with history of UGIB usually had a significant decrease of Hb value ($p < 0,05$). This was supported by previous data that suggested that high-risk patients (69 people) had average Hb of 8 g/dL, while low-risk patients had average Hb of 11 g/dL. Hematocrit and Hb examination is useful, hematocrit value can show anemia or polycythemia. Significant hematocrit change reflected blood loss. NS infusion could accelerate equilibration of hematocrit, but rapid infusion with crystalloid in non haemorrhagic patients could decrease the value of hematocrit because of hemodilution. Optimal value of hematocrit to be able to maximize oxygen-carrying capacity and viscosity in critical patients was as high as 33%. In general, patients with Hb value of 8 g/dL or less (hematocrit < 25%) caused by acute bleeding needed blood transfusion. After transfusion and assurance that there was no more blood loss, hematocrit was expected to rise by 3% for every unit of blood given (hemoglobin rose by 1 g/dL) (2,7,11,13,14).

BUN ($p < 0,05$) level was elevated in UGIB patients because blood absorption in GI tract and hypovolemic condition could cause prerenal azotemia. From the patients' data, more than half of nonvariceal UGIB had average BUN of 39,99 mg/dL. This data concluded that the patients with increased BUN level possibly had increased severity of nonvariceal UGIB. Ratio of BUN compared to creatinine serum could also be used to predict the source of bleeding, peak level between 24-48 hours since the start of bleeding, normal comparison is 20. If the ratio was higher than 35, the bleeding was more likely from upper GI. After 24 hours, hypovolemic state could determine dominant azotemia if there was recurrent bleeding (10,11,14).

SBP and syncope didn't show significant difference in affecting the risk of UGIB in IRS, possibly because the bleeding in nonvariceal UGIB patients was not as much as in variceal UGIB patients. However, average heart rate score showed significant difference. From the data, it could be concluded that nonvariceal UGIB patients in the sample population didn't experience any hemodynamic instability. From the sample distribution, it was also stated that in general, the average SBP (83,3% SBP $\geq$ 100 mmHg) and heart rate (48% heart rate is 80-

100 bpm) of the patients were stable. Acute massive bleeding of more than 20% intravascular volume would cause hemodynamic instability. It is commonly manifested in signs including hypotension (<90/60 mmHg or MAP < 70 mmHg) with pulse rate > 100 bpm, diastolic blood pressure decreased by > 10 mmHg or systolic blood pressure decreased by > 20 mmHg, cold extremities, altered mental state, syncope, anuria or oliguria (urine production < 20 ml/jam). Aside of hemodynamic instability, massive acute bleeding could also be suspected in case of hematemesis, hematochezia, fresh blood in NGT that didn't disappear with repeated gastric lavage, persistent hypotension, and needing blood transfusion of more than 800-1000 mL in 24 hours (1,2,15,16).

The parameter of age also didn't show significant difference (p = 0,447) since both patient groups with either high or low risk had not too different average age. All cases of UGIB could happen in various age, but mostly in age range of 40-70 years old. Almost all death cases happened in patients older than 60 years old. UGIB cases happened more often in males compared to females (2:1), but lower GI bleeding happened more often in females (9,14). This is in accordance with the acquired data which showed that there were more male patients than female patients (3 (61 patients): 2 (41 patients)).

History of heart disease in nonvariceal UGIB patients was not too significant in GBS (p=0,276), but was significant in IRS (p=0,005). This could happen because not all patients and the ones included in sample population had heart disease. Realistically, patients that had heart disease had increased risk of more severenonvariceal UGIB because of unstable hemodynamic. Decrease in COP could cause ischemia of gastric mucosa, increasing the risk of ulceration and could potentially induce bleeding. Continuous consumption of medicines such as aspirin in patients with history of coronary heart disease could also play a role in increasing the risk of nonvariceal UGIB (17).

History of liver disease was not found significant in GBS (p = 0,054), but was significant in IRS (p= 0,000) and could affect patients with nonvariceal UGIB. This was probably because in patients with history of liver disease or liver cirrhosis, UGIB was more commonly variceal. The complications of liver cirrhosis included esophageal varices rupture, splenomegaly, ascites, portal hypertension, hepatic encephalopathy, spontaneous bacterial peritonitis, hepatorenal syndrome, and liver cancer (18). In some cases, patients with liver cirrhotic also had coagulopathy and hemostatic disorder, which caused more profuse bleeding.

Chi-square test on endoscopy from both scores, either IRS or GBS, found significant differences (p < 0,05). This showed that the higher the values in both scores, the higher the endoscopy grade (according to Forest Classification) of the patients, and it was also possible that an active bleeding was found in the GI tract (1,2,16). From the previous data, it was found that the endoscopy result of high-risk patient group from both scores had the highest percentage (IRS 37,25% (38 people), GBS 54,9% (56 people)). From the sensitivity and specificity test, it was found that GBS (sensitivity 96,55%, specificity 70,45%) was better than IRS (sensitivity 65,52%, specificity 79,55%). This data was further solidified by the ROC curve which showed that area under curve of GBS (p < 0,05 with 95% CI with value of 0,91 – 1,00) is better than IRS (p < 0,05 with 95% CI and value of 0,65 – 0,84). This result is in accordance with a research by Stanley, et al., (2009) which stated that GBS is better than Rockall score in predicting the necessity of intervention on UGIB patients and to determine the incidence of mortality (0,92 (95% CI 0,80-0,94) vs 0,72 (0,68-0,72)).

In 2011, Stanley, et al. continued their research and stated that GBS was not significantly different to IRS (AUROC 0,804 vs 0,801) and the complete (AUROC 0,741 vs 0,790) in predicting the incidence of mortality of UGIB patients. GBS also performed better than IRS (AUROC 0,858 vs 0,705) and similar with the complete (AUROC 0,822 vs 0,797) in predicting the necessity of intervention/surgery of UGIB patients. GBS was also shown to be better than IRS (AUROC 0,944 vs 0,756) and the complete (0,935 vs 0,792) in predicting the necessity of transfusion for UGIB patients (19,20). Other references also stated that GBS could be used to determine the criteria for safe discharge of UGIB patients (2,6,19,20,21,22). This shows that GBS is better in diagnosing the severity of patients that came with UGIB.

According to the research, GBS was simpler and more practical in use, and more specific for patients that came with UGIB compared to IRS. GBS could be used as an alternative to endoscopy which is now still the gold standard to determine the severity of UGIB. The results were also supported by the higher positive predictive value and negative predictive value of GBS (81,16% & 93,94%) compared to IRS (80,85% & 63,64%). This data further reinforced the idea that GBS could be used as an early screening method to determine the severity of UGIB patients, especially in primary health centers or hospitals in Indonesia that still weren't equipped with endoscopy. Other than that, the advantage of GBS was probably because the parameters used were more specific and simpler (based on clinical examinations and laboratory values) so that assessing the prognostic of the UGIB patients could be done more quickly and easily. GBS system could be used in primary health centers to quickly assess whether the patients needed admission (6,19,20,21,22). According to the research, it could be concluded that GBS had better sensitivity and specificity than IRS so it could be used as an alternative to endoscopy to determine the severity of patients coming to the ER complaining of nonvariceal upper gastrointestinal bleeding.

CONCLUSION

The GBS can be used as alternative tools in determining the severity of patients presenting with non-variceal UGIB. Certainly, the use of the GBS than IRS is only as far early detection (early screening), particularly in the community health service centers and hospitals in Indonesia, where is endoscopy equipment not available. More parameter in GBS make this predictor more specific to predict the severity patients with non variceal UGIB.

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