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Research paper

Comparison of the AIMS65 and Glasgow Blatchford score for risk stratification in elderly patients with upper gastrointestinal bleeding



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ABSTRACT

Objective: To compare the performances of the AIMS65 and Glasgow Blatchford risk score (GBRS) as risk assessment tools in elderly patients with upper gastrointestinal bleeding (UGIB).

Methods: A retrospective study was performed in 293 elderly patients with UGIB in the gastroenterology department. The primary outcome was inpatient mortality. Secondary outcomes were rebleeding, blood transfusion and a composite clinical endpoint of inpatient mortality, rebleeding, and endoscopic, radiologic or surgical intervention. The GBRS and AIMS65 scores were respectively calculated for all elderly patients. And the area under the receiver operating characteristic curve (AUROC) was calculated to evaluate the predictive value of the two scoring systems.

Results: Of the 293 elderly patients, 27 (9.2%) died, 31 (10.6%) rebleeding, 164 (55.9%) received blood transfusion, and 100 (34.1%) experienced the composite clinical endpoint. The AUROCs of the AIMS65 score for inpatient mortality, rebleeding, blood transfusion and the composite clinical endpoint were 0.833 (95%CI: 0.785–0.874), 0.646 (95%CI: 0.588–0.700), 0.666 (95%CI: 0.609–0.720), 0.702 (95%CI: 0.645–0.754), respectively. The AUROCs of the GBRS were 0.681 (95%CI: 0.624–0.734), 0.746 (95%CI: 0.692–0.795), 0.753 (95%CI: 0.700–0.802), 0.744 (95%CI: 0.690–0.793), respectively.

Conclusions: For the elderly patients with UGIB, the AIMS65 score is superior to GBRS in predicting inpatient mortality, and the GBRS is superior in predicting rebleeding and blood transfusion. Both scores are similar in predicting the composite clinical endpoint.

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1. Introduction

Upper gastrointestinal bleeding (UGIB) is one of the most common diseases in clinical practice, which carries significant morbidity and mortality [1,2]. Over recent years the percentage of elderly patients suffering from UGIB has increased rapidly, mostly because of the increased life expectancy and widespread use of nonsteroidal anti-inflammatory drugs (NSAIDs) and anticoagulants [3]. In elderly patients with UGIB, advanced age itself is a major risk factor for mortality because of their higher prevalence of comorbidities (including cardiovascular and pulmonary diseases). UGIB in the elderly means more complicated outcomes than in the young. It is a challenge for a physician to identify elderly patients at high risk for rebleeding or mortality. So early risk stratification by

using validated prognostic scales is essential for proper management on elderly patients with UGIB [4].

Several prognostic scores have been used to predict outcomes for UGIB in clinical practice, such as the Rockall score [5], the Glasgow Blatchford risk score (GBRS) [6], and the AIMS65 score [7]. The GBRS is one of the most widely used scores, which was developed to predict a composite endpoint of inpatient mortality, rebleeding, need for blood transfusion, endoscopic or surgical intervention, and a significant decrease in the hematocrit [6]. Recently a new risk stratification score, the AIMS65, is applied in some researches, which can predict inpatient mortality in patients with unselected UGIB [8]. Compared with the Rockall score, the GBRS and AIMS65 scores don't rely on endoscopic finding and can be calculated by using parameters routinely available. So the GBRS and AIMS65 score are more suitable in clinical practice.

In this study, we aimed to compare the performances between the GBRS and AIMS65 score on inpatient mortality, rebleeding, blood transfusion and the composite clinical endpoint in elderly patients with UGIB.

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2. Materials and methods

2.1. Patients

This retrospective study was performed in the gastroenterology department of our tertiary care, university affiliated hospital. Elderly patients were enrolled with admission diagnosis as UGIB from October 2012 to December 2015. Their symptoms included melena, haematemesis and/or haematochezia, coffee-ground vomiting or stool. The inclusion criteria for the study were as follows: admission diagnosis as UGIB; all patients above 65 years of age; endoscopic evaluation within 24 h of hospital admission. Exclusion criteria were: the data required for calculation of risk stratification scores were incomplete; the source of bleeding was at the lower gastrointestinal tract; patients who did not undergo endoscopy; the source of bleeding was obscure. The study was reviewed and approved by the medical ethics committee of our hospital.

Clinical and laboratory data were collected from their medical records: age, sex, blood urea nitrogen (BUN), international normalized ratio (INR), systolic blood pressure (SBP), hemoglobin, albumin, pulse rate, mental status, presence of melena or syncope, medication use and medical history. The GBRs and AIMS65 score were calculated in all elderly patients at the time of admission. The primary outcome was inpatient mortality. Secondary outcomes were rebleeding, blood transfusion and a composite clinical endpoint of inpatient mortality, rebleeding, and endoscopic, radiologic or surgical intervention.

2.2. Definitions

Inpatient mortality was defined as death from any cause during hospitalization. Rebleeding was defined as a further episode of bleeding occurring since hospitalization after the initial bleeding had stopped, based on clinical evidence, such as recurrent melena, haematemesis, haematochezia or circulatory instability [9]. Blood transfusion was indicated for UGIB patients with hemoglobin less than 7 g/dL or with signs of hemodynamic instability despite fluid resuscitation. The composite clinical endpoint included inpatient mortality, rebleeding, and endoscopic, radiologic or surgical intervention [10,11]. Altered mental status was defined as Glasgow Coma Scale score of less than 14 or a designation of disoriented, lethargy, stupor or coma by a treating physician [7]. Comparison of the GBRs and AIMS65 score is showed in Table 1.

2.3. Statistical analysis

Accuracy to predict inpatient mortality, rebleeding, blood transfusion and the composite clinical endpoint was evaluated by the area under the receiver operating characteristic curve (AUROC) with 95% confidence interval (CI). The *t*-test was used to evaluate continuous variables. The χ^2 test was applied to evaluate categorical variables. A *P*-value below 0.05 was considered statistically significant. The data analysis was performed by using Medcalc 15.2.2.

3. Results

3.1. Patient characteristics

For the period from October 2012 to December 2015, there were 345 elderly patients who visited the gastroenterology department of our hospital for complaints of UGIB. According to the inclusion and exclusion criteria, 293 patients were included in the final analysis. 170 (58.0%) were male and 123 (42.0%) were female, and their average age was (72.4 ± 6.3) years. The most frequent cause of bleeding was peptic ulcers (*n* = 164, 55.9%),

Table 1

Comparison of the AIMS65 and the Glasgow Blatchford risk score.

Glasgow Blatchford risk score		AIMS65 score	
Risk factor	Score	Risk factor	Score
BUN, mg/dL		Albumin < 3.0 mg/dL	1
≥18.2 to <22.4	2	INR > 1.5	1
≥22.4 to <28.0	3	Altered mental status	1
≥28.0 to <70.0	4	SBP ≤ 90 mmHg	1
≥70.0	6	Age > 65 y	1
Hemoglobin, men g/dL			
≥12.0 to <13.0	1		
≥10.0 to <12.0	3		
<10.0	6		
Hemoglobin, women g/dL			
≥10.0 to <12.0	1		
<10.0	6		
SBP, mmHg			
100–109	1		
90–99	2		
<90	3		
Other markers			
Heart rate ≥100 bpm	1		
Melena	1		
Syncope	2		
Hepatic diseases	2		
Heart failure	2		

BUN: blood urea nitrogen; INR: international normalized ratio; SBP: systolic blood pressure; bpm: beats per minute.

followed by esophagogastric varices (*n* = 72, 24.6%), hemorrhage gastritis (*n* = 25, 8.5%), gastric cancer (*n* = 18, 6.1%), Mallory–Weiss tears (*n* = 7, 2.3%), vascular ectasia (*n* = 4, 1.4%), esophageal cancer (*n* = 3, 1.0%). Totally 197 (67.2%) elderly patients had comorbid diseases. NSAIDs were used in 92 patients (31.3%), and Aspirin (*n* = 66, 22.2%) was the most frequently used drug. The characteristics of the elderly patients with UGIB are shown in Table 2.

3.2. Mortality

Among these elderly patients, 27 (9.2%) suffered death with an average age of (74.1 ± 8.0) years. Table 3 shows the characteristics between survivors and non-survivors. The mortality rate in variceal patients was higher than that in non-variceal patients (12/72, 16.6% vs 15/221, 6.8%), and the difference was statistically significant (*P* = 0.022). For AIMS65 scores of 1, 2, 3, 4, 5, the inpatient mortality were 0.7% (1/145), 11.6% (11/95), 13.2% (5/38), 61.5% (8/13), 100% (2/2), respectively. For elderly patients with UGIB, the AIMS65 score was superior to GBRs for predicting inpatient mortality (0.833 [95%CI: 0.785–0.874] vs 0.681 [95%CI: 0.624–0.734], *P* < 0.01) (Fig. 1).

Table 2

The characteristics of elderly patients with UGIB.

Overall	293(100%)
Male	170(58.0%)
Age	72.4 ± 6.3
Bleeding type	
Variceal	72(24.6%)
Non-variceal	221(75.4%)
Comorbidities	
Cardiac disease	102(34.8%)
Diabetes mellitus	95(32.4%)
Liver disease	82(27.9%)
Pulmonary disease	75(25.6%)
Cerebrovascular disease	56(19.1%)
Malignancy	36(12.3%)
Outcomes	
Death	27(9.2%)
Rebleeding	31(10.6%)
Endoscopic therapy	42(14.3%)
Radiologic intervention	4(1.4%)
Surgical intervention	7(2.4%)
Blood transfusion	164(55.9%)

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