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Alimentary Tract

A simplified clinical risk score predicts the need for early endoscopy in non-variceal upper gastrointestinal bleeding

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ABSTRACT

Background: Pre-endoscopic triage of patients who require an early upper endoscopy can improve management of patients with non-variceal upper gastrointestinal bleeding.
Aims: To validate a new simplified clinical score (*T*-score) to assess the need of an early upper endoscopy in non variceal bleeding patients. Secondary outcomes were re-bleeding rate, 30-day bleeding-related mortality.
Methods: In this prospective, multicentre study patients with bleeding who underwent upper endoscopy were enrolled. The accuracy for high risk endoscopic stigmata of the *T*-score was compared with that of the Glasgow Blatchford risk score.
Results: Overall, 602 patients underwent early upper endoscopy, and 472 presented with non-variceal bleeding. High risk endoscopic stigmata were detected in 145 (30.7%) cases. *T*-score sensitivity and specificity for high risk endoscopic stigmata and bleeding-related mortality was 96% and 30%, and 80% and 71%, respectively. No statistically difference in predicting high risk endoscopic stigmata between *T*-score and Glasgow Blatchford risk score was observed (ROC curve: 0.72 vs. 0.69, $p = 0.11$). The two scores were also similar in predicting re-bleeding (ROC curve: 0.64 vs. 0.63, $p = 0.4$) and 30-day bleeding-related mortality (ROC curve: 0.78 vs. 0.76, $p = 0.3$).
Conclusions: The *T*-score appeared to predict high risk endoscopic stigmata, re-bleeding and mortality with similar accuracy to Glasgow Blatchford risk score. Such a score may be helpful for the prediction of high-risk patients who need a very early therapeutic endoscopy.

1. Introduction

Upper gastrointestinal bleeding (UGIB) is a common life-threatening condition with a significant impact on health care resources. Ideally, all patients with UGIB should undergo endoscopy within 24 h by a trained endoscopist supported by skilled assistant staff [1]. Although endoscopic therapy plays a pivotal role in UGIB management, the value of an early endoscopy is still debated. The definition of early endoscopy varies from 2 to 24 h from presentation [2], and retrospective studies did not show a clear advantage for an early as compared with a delayed endoscopy. Early endoscopy has been associated with a shorter hospital stay and reduced costs, although with no significant effect on mortality and need for surgery [3,4]. Use of prognostic scoring systems which include endoscopic findings is recommended by international guidelines to identify low-risk patients suitable for early discharge [1]. However, in order to decide the timing of

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endoscopy, risk assessment should be performed by scoring system including only clinical and laboratory variables. In UGIB patients the pre-endoscopic Blatchford risk score and the clinical Rockall score have been suggested to predict the need for clinical and endoscopic intervention and mortality, respectively [5,6]. Although the Blatchford score can accurately identify those low-risk patients not requiring a therapeutic endoscopy, it has not been designed to predict the need and the timing for an early endoscopy. In a pilot single-centre study, we showed that a new simplified pre-endoscopic clinical and laboratory score (*T*-score) may accurately predict the presence of active bleeding or high risk stigmata [7]. Aim of this multicentre study was to prospectively validate the accuracy of the *T*-score in predicting high risk endoscopic stigmata, re-bleeding and mortality in non-variceal bleeding patients as compared with the Glasgow Blatchford risk (GBR) score, which was previously tested in such a setting [8].

2. Methods

2.1. Study population

Overall, 30 Endoscopy Units with out of hours endoscopy service participated in this nationwide study. Consecutive patients admitted for UGIB, as well as inpatients presenting with UGIB, were considered for enrolment during a 6 month period. According to the study protocol, an early (≤2 h) upper endoscopy was to be performed in all the UGIB-patients in the study period, irrespectively of any clinical or other factors. All patients presenting with non-variceal UGIB were included, whilst those with oesophageal or gastric varices bleeding were excluded, as well those in whom upper endoscopy was performed beyond the 2-h limit. Baseline characteristics, comorbidities, haemodynamic, laboratory and endoscopy findings were systematically recorded. Patients were followed up for a total of 30 days in order to assess re-bleeding and mortality rates. The clinical outcome of inpatients was recorded by the referring physician whereas patients discharged were contacted by telephone. A bleeding-related death was defined as any death occurring within 30 days of the index bleeding episode. Recurrent bleeding was defined by recurrent hematemesis, melena or both with either shock or a decrease in haemoglobin concentration of at least 2 g/l after initial treatment and stabilization. Re-bleeding had to be confirmed by a repeat endoscopy. When the source of bleeding was not identified due to the presence of fresh blood in the stomach, case was recorded as bleeding but source not identified at EGD [9].

2.2. Pre-endoscopic clinical scores

Before the procedure, patients were stratified by the endoscopists according to 4 clinical variables: general conditions (poor, intermediate, good), pulse (<90 beats/min, 90–110 beats/min, >110 beats/min), systolic blood pressure (<90 mmHg, 90–110 mmHg, >110 mmHg), and haemoglobin level (<9 g/dL, 9–10 g/dL, >10 g/dL) [7–11]. General conditions were intended as a measure of the risk of an impending shock – defined as shock index >0.8 calculated as ratio heart rate/systolic blood pressure [12] – or the presence of symptomatic comorbidities (cardiovascular, hepatic, chronic kidney disease, diabetes, malignancy). In detail, "poor conditions" included patients with impending shock or with ≥3 comorbidities, "good conditions" included patients with no debilitation and without postural hypotension and ≤1 comorbidity, whereas patients with 2 comorbidities and without postural hypotension were classified as with "intermediate conditions". A numerical score was created for each of these parameters, the sum of all the parameters resulting in the total *T*-score. Patients were thereafter classified according to arbitrarily defined *T*-score cut-off in 3 categories: a sum ≤6 corresponds to T1 (high-risk), a sum of 7–9 to T2 (intermediate-risk), and a cumulative value ≥10 to T3 (low-risk). The GBR score was also calculated for each patient, as previously reported (Appendix B) [7]. High risk endoscopic stigmata was defined as active bleeding (oozing or spurting), presence of an adherent clot or nonbleeding visible vessel on peptic ulcer [13], as well as on other bleeding lesions, such as Mallory-Weiss tears, Dieulafoy's lesion, neoplasia, gastroduodenal erosions, or other vascular source. All patients gave their informed consent prior the endoscopic examination.

2.3. Study outcomes

Primary endpoint was the accuracy of *T*- and GBR-scores in predicting high risk endoscopic stigmata at an early endoscopy. Secondary end-points were the ability of these scores in predicting re-bleeding and mortality rates at 30 days of follow-up.

2.4. Statistical analysis

Continuous variables were analyzed by independent-sample *T* test and categorical variables were analyzed by Chi-square test. We assessed the validity of the scoring system by plotting receiver-operating characteristics (ROC) curves. *T*- and GBR-scores were compared in the prediction of high risk endoscopic stigmata. All statistical analyses were performed with SPSS version 13.0 (SPSS Inc., Chicago, IL). A p value <0.05 was considered to be statistically significant.

3. Results

3.1. Study population

A total of 860 consecutive patients were considered for enrolment in the study period. Overall, 602 patients had an early EGD within 2 h with a median time of 89 min (inter-quartile range, IQR: 60–110 min), whilst the remaining 258 cases were excluded since the EGD was performed beyond the 2 h limit. At endoscopy, further 130 patients were excluded due to gastro-oesophageal varices bleeding. Therefore, 472 patients (316 males, 156 females; median age 74 years, IQR 60.5–82.3) with non-variceal UGIB were included in the final analysis, 319 (67.6%) being outpatients and 153 (32.4%) inpatients. Main clinical characteristics of the study population are shown in Table 1.

3.2. Endoscopic and clinical outcomes

The main endoscopic findings are provided in Table 2. At endoscopy, high risk endoscopic stigmata were detected in 145 (50.8%) out 286 ulcers, including active bleeding (N = 70), visible

Table 1
Clinical characteristics of the study population.

	N (%)	Median (IQR)
Males	316 (66.9%)	
Age (years)		74.0 (60.5–82.3)
Number of comorbidities	2 (2–3)	
In-hospital bleeding	153 (32.4)	
Time of endoscopy (min)		89 (60–110)
Melena	354 (75.0)	
Syncope	69 (14.6)	
Hemodinamic instability	70 (14.8)	
Haemoglobin (g/dl)		9.0 (7.5–10.6)
Urea (mmol/l)		8.8 (5.3–14.4)

IQR: interquartile range.