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RAPID COMMUNICATION

Endoscopic findings in patients with upper gastrointestinal bleeding clinically classified into three risk groups prior to endoscopy

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Abstract

AIM: To investigate in a prospective study whether a simplified clinical score prior to endoscopy in upper gastrointestinal bleeding (UGIB) patients was able to predict endoscopic findings at urgent endoscopy.

METHODS: All consecutive UGIB patients referred to a single endoscopic center during a 16 mo period were enrolled. Before endoscopy patients were stratified according to a simple clinical score (T-score), including T1 (high-risk), T2 (intermediate-risk) and T3 (low-risk). Endoscopy was performed in all cases within 2 h, and high-risk stigmata were considered for further analysis.

RESULTS: Out of the 436 patients included into the study, 126 (29%) resulted to be T1, 135 (31%) T2, and 175 (40%) T3. Overall, stigmata of recent haemorrhage (SRH) were detected in 118 cases (27%). SRH occurred more frequently in T1 patients than in T2/T3 cases (85% *vs* 3.2%; $\chi^2 = 304.5309$, $P < 0.001$). Older age ($t = 3.311$; $P < 0.01$) and presence of comorbidities ($\chi^2 = 14.7458$; $P < 0.01$) were more frequently detected in T1 than in T2/T3 patients.

CONCLUSION: Our simplified clinical score appeared to be associated with the detection of endoscopic findings which may deserve urgent endoscopy. A further, randomised study is needed to assess its accuracy in safely scheduling endoscopy in UGIB patients.

Key words: Upper gastrointestinal bleeding; Urgent endoscopy; Timing score; Endoscopic treatment; Oesophageal varices; Peptic ulcer

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INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB) is a very common condition, with an estimated incidence as high as 40-150 cases per 100 000 annually[1-3]. Undeniably, UGIB is a dramatic event resulting in a high mortality rate, ranging from 0.9% to 26.5%[1-4]. Moreover, it leads to 50-150 hospitalizations per 100 000 adults each year[5]. Upper gastrointestinal endoscopy plays a pivotal role in the diagnosis and therapy of these patients, reducing mortality, rebleeding, requirement for transfusion, hospital stay and health care costs[6-9]. Endoscopic haemostasis has been shown to be effective in most of the causes of UGIB, such as peptic ulcer, gastro-oesophageal varices and Mallory-Weiss lesions[8,10,11]. For this reason, urgent endoscopy is routinely provided by several hospitals both in Europe and United States. Moreover, the absence of stigmata of recent haemorrhage (SRH), such as an adherent clot or an arterial bleeding, may prompt an early discharge of the patients, resulting in substantial healthcare savings[12]. Furthermore, several scoring systems, based on clinical-

endoscopic features, have been extrapolated in order to predict the risk of rebleeding and mortality[13-17]. Specifically, haemoglobin level, hemodynamic instability, and the presence of comorbidities have been shown to be clinical variables associated with a poorer outcome. Regarding timing of urgent endoscopy, it is widely accepted that it should be performed within 24 h from the admission[18]. However, within this period of time, it is still unclear whether it should be performed either very early-i.e. within 2 h- or in a more delayed interval, such as after 6, 12 or 24 h. In particular, some retrospective series did not show a clear advantage for early versus delayed urgent endoscopy[19-22]. However, in clinical practice, the endoscopist may be expected to be called by the emergency department immediately after the hospital admission of the bleeding patient, making it his responsibility to proceed towards an immediate procedure or delaying it up to 12 or 24 h. Legal aspects are clearly entailed in this decisional process, so that, in the absence of clear data, endoscopists may be expected to rush in the endoscopic units, even in low-risk cases. This may be particularly troublesome in large hospitals in which the specialist may be repeatedly called during the night or on non-working days. Moreover, due to lack of clinical evidence, administrative parameters have been shown to be important predictors of the timing to endoscopy in UGIB, dangerously exposing similar patients to different outcomes according to the referral hospital. Therefore, optimal timing for urgent endoscopy in UGIB patients has not been yet established. The aim of this prospective study was to evaluate whether a simplified clinical score prior to endoscopy in UGIB patients was able to predict either active bleeding or SRH that may require an urgent (< 2 h) endoscopy.

MATERIALS AND METHODS

All consecutive patients referred to a single Endoscopic Unit because of an episode of UGIB during a 16 mo period were enrolled. The Endoscopic Unit belongs to a large hospital in which the physicians are urged to contact the gastroenterologist on call when patients present with an UGIB. For the purpose of the study, urgent endoscopy was always performed within 2 h from the referral. Before the procedure, patients were stratified by the endoscopists according to 4 easily assessable clinical variables, already validated in the UGIB setting: (1) general conditions (poor, intermediate, good), (2) pulse (< 90 beats/min, 90-110 beats/min, > 110 beats/min), (3) systolic blood pressure (< 90 mmHg, 90-110 mmHg, > 110 mmHg), and haemoglobin level (⩽ 8 g/dL, 9-10 g/dL, > 10 g/dL)[13-15]. General conditions were intended as a measure of the risk of an impending shock or the presence of symptomatic comorbidities (cardiovascular, hepatic, nephropathic, diabetes, malignancy). In detail, "poor condition" included patients with impending shock or with ⩾ 3 comorbities, "good condition" included patients with no debilitation and without postural hypotension and ⩽ 1 comorbidity, and "intermediate condition" those patients with conditions in the middle. As shown in Table 1, a numerical score was created for each of these parameters, the sum of all the parameters resulting in the total score (T-score) for each patient who was thereafter classified according to arbitrarily defined T-score cut-off in 3 categories. In detail, 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). Further clinical information were collected for data analysis. Validity of such a classification was tested according to the presence of SRH at endoscopy. In detail, SRH was defined as an adherent clot, a bleeding (oozing or spurting) or nonbleeding visible vessel[23], or gastro-oesophageal varices with active or recent signs of bleeding, such as a fibrin clot. All patients gave their informed consent prior endoscopic examination.

Table 1 Numerical values for each parameter of the clinical index adopted in the study

Clinical parameter	Score		
	1	2	3
General conditions	Poor	Intermediate	Good
Pulse (beats/min)	> 110	90-110	< 90
Systolic blood pressure (mmHg)	< 90	90-110	> 110
Haemoglobin levels (g/dL)	⩽ 8	9-10	> 10

The T-score is the sum of the corresponding values for the 4 parameters. In detail, a sum ⩽ 6 corresponds to T1 (high-risk), 7-9 to T2 (intermediate-risk), and a cumulative value ⩾ 10 to T3 (low-risk).

Statistical analysis

Data analysis was performed by using Chi-square and Student's *t*-test as appropriate, and $P < 0.05$ was considered statistically significant.

RESULTS

Overall, 436 patients (270 males, 166 females; Mean age: 65 ± 13 years) were included in the study. Regarding the setting, 126 (29%) patients were already hospitalized before the UGIB, whilst the remaining 310 (71%) had been admitted by the emergency department because of the UGIB. Major comorbidities were present in 157 patients (36%). In detail, a cardiac disease was present in 78 (18%) patients, a hepatic disease in 61 (14%) cases, a clotting impairment in 9 (2%) cases, whilst renal or neurological comorbidities were detected in the remaining 9 (2%) cases. The mean time between the request to the endoscopic unit and the performance of the urgent endoscopy was 1.6 ± 0.47 h. No death occurred before or during the endoscopic procedure itself. The main endoscopic findings are provided in Table 2. In detail, SRH were detected in 118 cases (27%), prompting an immediate endoscopic haemostasis in 105 (89%) of these cases. When classifying patients according to T-score, 126 (29%) resulted to be T1, 135 (31%) T2, and 175 (40%) T3. A SRH was detected at endoscopy in 107 (85%) T1-cases. In detail, an active bleeding (oozing or spurting) was reported in 34 (32%) T1-patients, a nonbleeding visible vessel/adherent clot was described

Table 2 Endoscopic findings and SRH detected in the study population

	Number of patients (%)
Endoscopic finding	436 cases
Duodenal ulcer	144 (33)
Gastric ulcer	74 (17)
Gastro-oesophageal varices	52 (12)
Erosive esophagitis	44 (10)
Malignancy	35 (8)
Erosive gastritis/duodenitis	80 (18)
Mallory-Weiss syndrome	7 (2)
SRH	118 cases
Active bleeding	37 (31)
Nonbleeding visible vessel	16 (14)
Adherent clot	40 (34)
Gastro-oesophageal varices with active or recent signs of bleeding	25 (21)

in 50 (47%) cases, and gastro-oesophageal varices with active or recent signs of bleeding in 24 (22%) patients. As far as T2-patients are concerned, only in 7 (5%) cases a SRH was detected, being an active bleeding in 2 cases, a nonbleeding visible vessel/adherent clot in 4 cases, and gastro-oesophageal varices in 1. Regarding the 175 patients classified as T3, a SRH was found at endoscopy only in 3 (2%) cases, being a nonbleeding visible vessel/adherent clot in 2 patients and an oozing bleeding in 1 case. When comparing the rate of SRH in T1 patients (85%) with that identified in T2 (5%) and/or T3 (2%), a significant difference emerged ($P < 0.001$). Comparison of further demographic and clinical variables is provided in Table 3. As shown, patients classified as T1 were older (69 *vs* 63 and 64 years; $t = 3.311$ and 3.443, respectively; $P < 0.01$) and more frequently had comorbidities (49% *vs* 20% and 31%; $\chi^2 = 14.7458$ and 13.4355, respectively; $P < 0.01$) than T2 and T3 patient groups.

Table 3 Demographical and clinical characteristics of the UGIB patients according to T-score classes

Variable	T1 (n = 126)	T2 (n = 135)	T3 (n = 175)	P
Mean age ± SD (yr)	69 ± 13	63 ± 16	64 ± 12	< 0.01[1]
Male sex (%)	66	62	60	NS
Comorbidities (%)	49	20	31	< 0.01[1]
Systolic blood pressure (mmHg)	85 ± 15	106 ± 22	139 ± 37	< 0.01[2]
Hemoglobin level (g/dL)	7.2 ± 1.3	9.7 ± 2.3	13.8 ± 3	< 0.01[2]

[1]T1 *vs* T2 or T3; [2]T1 *vs* T2 or T3 and T2 *vs* T3.

DISCUSSION

UGIB incidence may be expected to increase as the proportion of elderly people in the population rises, because of the higher prevalence of gastroduodenal diseases in this subgroup of people[24], particularly those NSAID associated[1,25]. Indeed, NSAIDs are widely used in clinical practice and they are the most relevant cause of UGIB[1,2,26], and recent data suggested that even selective COX-2 inhibitors are not risk free[27]. Undeniably, UGIB has a relevant economic impact[28]. Therefore, optimizing an urgent endoscopy setting is of a paramount importance. Indeed, upper endoscopy plays a pivotal role in UGIB diagnosis and treatment[29]. However, although it is widely accepted that urgent endoscopy should be performed within 24 h, the best timing is still unclear[18]. In the present study, we evaluated whether a simplified clinical score prior to endoscopy in UGIB patients was able to predict either active bleeding or SRH that may require an urgent (< 2 h) endoscopy. Our data found that within 24 h, different timing of urgent endoscopy for UGIB may be proposed. In particular, urgent endoscopy may provide a therapeutic resource for most of the patients in severe clinical conditions (T1 score), whilst it does not appear to be necessary in those patients with more favourable conditions (T2/T3 score). Although there was no evidence of a better clinical outcome-i.e. rebleeding and mortality-after a very early endoscopy in some retrospective series[19-22], our study shows that endoscopic therapy is necessary in most of the clinically severe cases. Since an effective endoscopic haemostasis has been associated with a better outcome for both variceal and non-variceal UGIB[8,9], it may be conservatively advised to perform a very early endoscopy, at least in patients in more severe conditions. Moreover, endoscopy may be also useful to stratify these compromised patients, since endoscopic SRH have been shown to predict the UGIB-associated morbidity and mortality[13]. On the other hand, our prospective study clearly shows that urgent endoscopy is useless in the vast majority of those patients in intermediate or good clinical conditions, which account for more than two thirds of all UGIB patients, since only a very few of them really gain some benefit from the endoscopic procedure. Due to the relatively stable clinical conditions, it is foreseeable that even in those few patients with SHR, a delay in the urgent endoscopy to 12 h, sufficient to postpone the endoscopy procedure from the night to the immediate following day endoscopic routine list, would have not changed the overall outcome. Our study suggests that the use of a simple clinical score may predict endoscopic SRH in UGIB patients. In particular, to our knowledge, this is the first time that a simple clinical score has been associated with endoscopic findings at urgent endoscopy in a prospective series. This points out that clinical parameters are not only useful in selecting those who may need an urgent endoscopy from those who may not, but also in selecting, among those who need it, those who need a very early procedure. On the other hand, upper endoscopy in T2/T3 score patients may be delayed until the next routine endoscopic list, in which a more suitable setting, i.e. either a more skilled endoscopist or a prolonged pre-endoscopic proton pump inhibitor therapy may result in a better outcome[29,30]. Importantly, no death occurred before endoscopy and in the endoscopic setting, supporting the safety of a very early endoscopy even in severe patients, although previous series described

higher cardiovascular complications as compared to more delayed procedures[21]. Although urgent endoscopy is usually defined as a within 24 h-procedure[18], legal aspects may be raised against the on-call physician who prefers a delayed approach, when severe complications or even mortality associated to the UGIB episode occur before endoscopy. For this reason, endoscopists generally prefer to anticipate more than to delay an emergency procedure. We feel that our study allows an immediate and user-friendly clinical stratification, allowing less severe patients to be postponed until the next morning. Some limitations are entailed in the present study. In particular, we did not assess the rebleeding rate and the associated mortality in the post-endoscopic period. Nevertheless, SRH's have been shown to be intimately related with these outcomes, and may therefore be regarded as valid intermediate surrogates. However, further studies specifically addressing these end-points, namely rebleeding rate and associated mortality, are needed before proposing the use of such a pre-endoscopic score in clinical practice. In particular, we cannot exclude that even severe UGIB episodes may be only of marginal clinical interest in patients affected by severe comorbidities, such as renal failure. Moreover, it would be important to further validate in future studies our score with others already available in the literature. Secondly, we did not apply different timings (very early *versus* delayed) in T2/T3 patients. However, after these findings, we feel clinically meaningful to plan a further study in which different timings will be tailored according to clinical conditions. Thirdly, we may not exclude that if the urgent endoscopy had been performed later than 2 h, but still within 24 h, the rate of SRH would have been different. However, it is unlikely that such a wide difference between T1, on one side, and T2 and T3, on the other, would have been significantly affected. Fourthly, we applied our score also to oesophageal variceal bleeding. However, as soon as these patients are correctly diagnosed with the underlying liver disease, they should have a prompt endoscopy, irrespective of the severity of the bleeding.

In conclusion, our study shows that timing of urgent endoscopy following an episode of UGIB could be differentiated according to a simple score purely reflecting the clinical conditions of the patients. This would allow most of the patients with SRH to be effectively treated, whilst delaying most of the purely diagnostic procedures in low risk clinical patients. A future, randomized study is required to validate this clinical score.

COMMENTS

Background

Acute upper gastrointestinal bleeding (UGIB) is a very common condition, with an incidence of 40-150 cases per 100 000, resulting in high hospitalization and mortality rates. Upper gastrointestinal endoscopy plays a major role in the diagnosis and therapy of these patients, reducing mortality, rebleeding, requirement for transfusion, hospital stay and health care costs. It is widely accepted that urgent endoscopy for UGIB should be performed within 24 h from the admission. However, within this period of time, it is still unclear whether it should be performed either very early, i.e. within 2 h, or in a more delayed interval, such as after 6, 12 or 24 h. Therefore, optimal timing for urgent endoscopy in UGIB patients has not been yet established.

Research frontiers

A simple clinical score prior to endoscopy, purely based on general conditions, pulse and haemoglobin level, was strongly associated with the detection of active bleeding or stigmata of recent hemorrhage. When classifying 436 patients according to this score (T-score), active bleeding or signs of recent hemorrhage was detected in 85% of T1 (most severe) patients and only in 5% and 2% of those T2/T3 (less severe), respectively.

Innovations and breakthroughs

This study shows that timing of urgent endoscopy following an episode of UGIB may be differentiated according to a simple score purely reflecting the clinical conditions of the patients. This would allow most of the high-risk patients to be effectively treated, whilst delaying most of the purely diagnostic procedures in low risk clinical patients. A future, randomized study is required to validate this clinical score.

Peer review

This is an interesting study that attempts to stratify the urgency for upper GI endoscopy in a patient presenting with acute bleeding. The choice of the "clinical" parameters and the cut-off values chosen are empiric.

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