Digestive and Liver Disease 46 (2014) 231–236

Contents lists available at ScienceDirect

Digestive and Liver Disease

journal homepage: www.elsevier.com/locate/dld

Alimentary Tract

Predictors of favourable outcome in non-variceal upper gastrointestinal bleeding: Implications for early discharge?

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ARTICLE INFO

Article history:
Received 13 August 2013
Accepted 28 October 2013
Available online 19 December 2013

Keywords:
Adverse outcomes
Early discharge
Gastrointestinal bleeding
Prediction rule
Risk assessment

ABSTRACT

Background: There is a lack of validated predictors on which to decide the timing of discharge in patients already hospitalized for upper nonvariceal bleeding.
Aims: Identify factors that appear to protect nonvariceal bleeders from the development of negative outcome (rebleeding, surgery, death).
Methods: Secondary analysis of two prospective multicenter studies. Multivariate analyses for each investigated outcome were performed; a single model was developed including all factors that were statistically significant in each sub-model. A final score was developed to predict favourable outcomes. Prognostic accuracy was tested with ROC curve analysis.
Results: Out of 2398 patients, 211 (8.8%) developed one or more adverse outcomes: 87 (3.63%) had rebleeding, 46 (1.92%) needed surgery and 107 (4.46%) died. Predictors of favourable prognosis were: ASA score 1 or 2, absence of neoplasia, outpatient bleeding, use of low-dose aspirin, no need for transfusions, clean-based ulcer, age <70 years, no haemodynamic instability successful endoscopic diagnosis/therapy, no Dieulafoy's lesion at endoscopy, no hematemesis on presentation and no need for endoscopic treatment. Overall prognostic accuracy of the model was 83%. The final score accurately identified 20–30% of patients that eventually do not develop any negative outcome.
Conclusions: The "good luck score" may be a useful tool in deciding when to discharge a patient already hospitalized for acute non-variceal bleeding.

1. Introduction

Acute nonvariceal upper gastrointestinal bleeding (NVUGIB) is a common reason for hospitalization with substantial associated morbidity, mortality, and health care resource use [1–4]. In patients suffering an episode of NVUGIB, much effort has been devoted to the identification of prognosticators of unfavourable outcome, specifically recurrent bleeding and mortality [5–14] or the need for therapeutic intervention at endoscopy [15]. The application of accurate prediction rules helps to improve clinical management and correctly allocate the adequate level of care and resources [16–18]. These combined scoring systems facilitate risk stratification and identification of high-risk patients to be treated endoscopically and low-risk patients suitable for early discharge or outpatient management, with substantial hospital cost savings [19–22]. Patient hospitalized for NVUGIB and treated endoscopically are usually observed in the general ward and managed according to guidelines [16–18]. Home discharge in these cases is decided on case-by-case basis and left to the decision of the individual physician, usually after a period of observation and stabilization of clinical, laboratory and haemodynamic parameters. There is a lack of validated predictors on which to decide the timing of discharge in patients already hospitalized for NVUGIB.

Primary aim of the study was to identify factors that appear to protect patients with NVUGIB from the development of any negative outcome (recurrent bleeding, need for surgery and death). Secondary aim was to develop a score to predict favourable

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1590-8658/$36.00
http://dx.doi.org/10.1016/j.dld.2013.10.017

outcome of these patients already hospitalized for NVUGIB and that could be safely discharged home.

2. Methods

Two nationwide prospective, multicenter databases (PNED 1 and PNED 2 studies) containing data on consecutive patients admitted to participating hospitals for acute NVUGIB were analysed [8,11]. In each study a project-specific research database was developed, which collected data from participating sites across Italy. At each hospital a coordinator identified subjects daily in the accident and emergency department, the wards, the endoscopy unit, the operating theatre, and from blood transfusion records and admission data. Specially trained research assistants collected data directly from the patient's point of care into case report forms. All data were downloaded into a central database on a monthly basis. They were reviewed at a single national location for internal logic of patient flow and biological plausibility. All data queries were resolved within 30 days following original data entry. To help assure the internal validity of the registry, there was an independent data validation of a random subset of all information collected; quality of data were validated on a quarterly basis by randomly comparing 5% of all records to the source data recorded in the hospital charts. All research staff was trained at a common start-up meeting where all endoscopists participating in the registry were invited to review a wide set of slides and video images of bleeding lesions in order to estimate inter-rater variability on the classification of bleeding stigmata and estimation of ulcer size. A help on line was provided together with the PNED software for the modified American Society of Anesthesiologists score [23], and for the correct categorization of ulcer stigmata.

Patients were considered for the study if they had clinical evidence of overt UGIB on admission or a history of hematemesis/coffee ground vomiting, melena, hematochezia or a combination of any of the above within 24 h preceding the admission, or clinical evidence of acute UGIB while hospitalized for any other reason (in-hospital bleeding), independently of their age. UGIB was confirmed only if either hematemesis, melena, or dark, tarry materials on rectal examination was documented and witnessed by nursing or medical staff. Patients were entered in the registry only if an upper GI endoscopy was performed. Patients were excluded if they were under 18 years of age, had chronic anaemia or obscure GI haemorrhage without clinical evidence of acute haemorrhage, had portal hypertensive-related aetiology of acute UGIB such as varices, or were transferred from another institution. An audit of all patients presenting over a fixed time period, at each participating institution, was performed to rule out any selection bias in the way in which the study population was enrolled.

Upper GI endoscopy was performed within 24 h to confirm the source of bleeding. Endoscopic therapy of high-risk ulcer stigmata included injection of diluted epinephrine, thermal coaptive coagulation or argon plasma coagulation, application of hemoclips or a combination thereof. The choice of the specific modality of endotherapy was left at the discretion of the operator according to the individual site's protocol.

Comorbidity was defined as the presence of any one of the following diseases: (1) cardiac diseases including coronary heart disease and congestive heart failure; (2) chronic pulmonary diseases; (3) acute and chronic liver disease including liver failure and cirrhosis; (4) gastrointestinal or biliary diseases including previous history of peptic ulcer and gallstone diseases; (5) acute and chronic renal diseases; (6) vascular disorders including peripheral vascular diseases and aortic aneurysm; (7) cerebrovascular disease; (8) diabetes mellitus and endocrine diseases; (9) hematologic disorders including leukaemia and lymphoma; and (10) presence of any malignancy.

2.1. Outcomes

In these two studies primary outcome measures were recurrent bleeding, need for surgery and death. Recurrent bleeding was defined by recurrent vomiting of fresh blood, melena, or both with either development of haemodynamic instability, or a decrease in haemoglobin concentration of at least 2 g/L, or of 5% or more in hematocrit following initial successful treatment and after a period of clinical stabilization of 24 h. Rebleeding had to be confirmed by a second endoscopy. Mortality was defined as any death occurring within 30 days of the index bleeding episode. A bleeding-related death was defined any death occurring after (a) uncontrolled bleeding; (b) within 48 h after endoscopy, without any other causes; (c) during surgery for uncontrolled bleeding; (d) surgical complications or within 1 month after surgery; and (e) endoscopic-related mortality. Under non-bleeding-related death, cases were considered patients suffering from comorbidity dying without shock at presentation [12,24]. Continued or persistent bleeding was defined as (a) failure to control arterial bleeding endoscopically; (b) presence of bloody nasogastric aspirate after endoscopic treatment; (c) haemodynamic instability, with a systolic blood pressure < 100 mmHg and a pulse greater than 100 beats/min, or both; and/or (d) the need for continuous replacement of blood or fluid volume. Persistent haemorrhage was usually considered an indication for emergency surgery or percutaneous embolization.

The presence of fresh blood into the stomach in such amount to hamper endoscopic diagnosis of the source of bleeding was annotated and underscored as a *bleeding but source not identified at EGD*. The impossibility for whatever reason to conclude an already started endoscopic procedure with the intention to treat the source of haemorrhage was defined as *failed endoscopic treatment*.

Recurrent bleeding and need for surgical intervention were monitored from the admission to the hospital or the onset of bleeding for in-hospital patients up to 30 days after the endoscopic examination. To ensure the completeness of follow-up, an outpatient clinic visit was scheduled at 30 days. The study nurses called all no-showing patients or their families or the referring primary care physician at 30 days.

2.2. Data collection

Patients' baseline characteristics and details of the endoscopic therapy were recorded on a purpose-built structured report form by endoscopists at the end of the procedure. Baseline demographic data, clinical presentation of the bleeding, any significant comorbid condition, as well as the seriousness of underlying illness (as determined by the modified ASA score [23]), severity of the bleeding, endoscopic findings, treatments performed, and the clinical outcomes were noted. Other baseline characteristics, such as physical examination findings and laboratory data (haemodynamic data, rectal exam, nasogastric tube use, complete blood count and coagulation parameters), any concurrent medication taken in the 7 days preceding the bleeding episode, time elapsed from the onset of bleeding, drug therapy administered before and after endoscopy and duration of hospital stay, were documented.

2.3. Clinical prediction rule and statistical analyses

Exploratory examinations of the clinical data collected including demographics and endoscopic findings involved the calculation of descriptive statistics (as appropriate the mean, standard deviation (SD), median, inter-quartile range (IQR), proportion and 95% confidence interval was computed). Comparison of continuous variables was performed with one- or two-way variance analysis, as appropriate. Proportions were compared using the chi-square test or Fisher's exact test, as appropriate.