Evaluation of the need for endoscopy to identify low-risk patients presenting with an acute upper gastrointestinal bleed suitable for early discharge

G G Robins, M S Sarwar, M Armstrong, M E Denyer, S Bush, T Hassan, S M Everett

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See end of article for authors' affiliations

Correspondence to:
Dr G Robins, Level 7,
Clinical Sciences Building, St
James's University Hospital,
Leeds LS9 7TF, UK;
medggr@leeds.ac.uk

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Aims: To audit the safety of differing protocol-driven early-discharge policies, from two sites, for low-risk acute upper gastrointestinal (GI) bleeding and determine if default early (<24 h) in-patient endoscopy is necessary.

Methods: All patients with low-risk acute upper GI bleeding presenting to two separate hospital sites in Leeds from August 2002 to March 2005 were identified. Both hospitals operate nurse-led process-driven protocols for discharge within 24 h, but only one includes default endoscopy. Relevant information was obtained from patients' notes, patient administration systems, discharge letters and endoscopy records.

Results: 120 patients were admitted to site A and 74 to site B. Median length of stay on the clinical decisions unit was 12.6 h at site A and 9.4 h at site B ($p=0.045$). Oesophagogastroduodenoscopy was performed on 89/120 (74%) patients at site A compared with only 7/74 (9%) at site B ($p<0.001$). Six of 120 (5%) patients from site A were admitted to hospital for further observation compared with 6/74 (8%) from site B ($p=0.38$). Of the remaining patients, all were discharged within 24 h, and 8/114 (7%) at site A vs 17/68 (25%) at site B were given hospital clinic follow-up ($p<0.001$). None of the 194 patients had further bleeding or complications within 30 days.

Conclusions: Patients admitted with a low-risk acute upper GI bleeding can be managed safely by a nurse-led process-driven protocol, based on readily available clinical and laboratory variables, with early discharge <24 h. Avoiding in-patient endoscopy appears to be safe but at the price of greater clinic follow-up.

Acute upper gastrointestinal (GI) bleeding is one of the most common emergencies managed by gastroenterologists. It has an incidence of 103 patients per 100 000 of the population each year in the UK, the incidence being highest in areas of lowest socioeconomic status.¹ An audit of patients admitted to hospital in the UK published in 1995 reported an overall mortality of 14%.¹ However, many admissions to hospital for acute upper GI bleeding are trivial—that is, require no clinical intervention, and are not indicative of significant underlying pathology. Previous stratification studies indicate that at least 20% of patients admitted for acute upper GI bleeding will have no need of intervention to control bleeding.² A number of risk scores have been designed to identify patients who have a low risk (ie, $\leq 2\%$) of adverse outcome and are suitable for early discharge,^{3–7} the best known of which is the Rockall score. These scores rely on endoscopic findings to stratify risk, whereas it would be useful to identify patients suitable for early discharge who may not need endoscopy.

Blatchford *et al*² devised a score in 2000 that aimed to identify patients who were in need of further clinical intervention after admission. The score comprises a number of clinical indices (table 1), although not age.^{1–3} Importantly, it does not require endoscopic findings, and, rather than focusing on mortality and morbidity, it assesses the need for subsequent intervention—that is, endoscopic or surgical treatment or blood transfusion. As part of this study, the authors identified an ultra-low-risk group, with a score of 0 or 1, who may be suitable for early discharge from hospital.

Relying on clinical findings and simple laboratory values only, the Blatchford score is potentially useful as a fast-track triage tool for deciding on appropriate level of care for patients admitted for an acute upper GI bleed. The development study for the Blatchford score derived its risk score from an audit of

1748 patients admitted for acute upper GI bleed in 19 hospitals across the west of Scotland. The score was prospectively evaluated by the original authors in a group of 197 consecutive adult patients admitted with acute upper GI bleeding over a 3-month period in three of the original 19 hospitals. The original validation group² and previous local data (personal communication, unpublished) suggested that the risk of "treatment"—that is, blood transfusion or endoscopic or surgical intervention—in a patient with a Blatchford score of ≤ 2 was $\sim 2\%$. We therefore retrospectively audited the use of an ultra-low Blatchford score (0 or 1) as part of a protocol-driven early-discharge policy for low-risk acute upper GI bleed and aimed to determine if default endoscopy is necessary in managing these patients safely. If not, more efficient use of endoscopy resources could be made. To our knowledge, experience with the use of an ultra-low Blatchford score as a component of an early-discharge policy for low-risk acute GI bleeds has not been previously published. The primary objective of this paper therefore is to assess the safety of discharging patients, presenting with a low-risk upper GI bleed (ie, Blatchford score ≤ 2 , defined by easily available clinical parameters) without an inpatient endoscopy. Secondary objectives were to assess how a policy of not performing endoscopy before discharge affected admission rates to the medical bed base, time spent by patients in hospital, and hospital follow-up.

METHODS

Setting

The Leeds Teaching Hospitals NHS Trust is the largest in the UK. The population served by its two largest hospitals is

Abbreviations: CDU, clinical decisions unit; GI, gastrointestinal; OGD, oesophagogastroduodenoscopy

Table 1 Admission risk markers and associated score component values

Admission risk marker	Score component value
Blood urea (mmol/l)	
≥6.5–<8.0	2
≥8.0–<10.0	3
≥10.0–<25.0	4
>25	6
Haemoglobin (g/l) for men	
≥120–<130	1
≥100–<120	3
<100	6
Haemoglobin (g/l) for women	
≥100–<120	1
<100	6
Systolic blood pressure (mm Hg)	
100–109	1
90–99	2
<90	3
Other markers	
Pulse ≥100 (per min)	1
Presentation with melaena	1
Presentation with syncope	2
Hepatic disease	2
Cardiac failure	2

From Blatchford *et al.*² A risk score to predict need for treatment for upper-gastrointestinal haemorrhage.

~700 000.⁸ Both sites serve populations with varied racial and socioeconomic background; site A serves a typical city centre population and also provides services to the south and eastern regions of Leeds, whereas site B predominantly serves the west and north of the city, which typically has more lower-social-class suburbs. A more detailed description of the characteristics of the study population at site A has been published.⁹

Both hospitals have an emergency department that can admit patients for defined conditions, including low-risk acute upper GI bleeding, to a nurse-led clinical decisions unit (CDU). Here, nurses manage care using defined protocols, although overall responsibility lies with emergency department clinicians. Although now part of the same trust, clinicians at site A and site B have developed protocols separately for low-risk upper GI bleeds. They are identical except for the policy on endoscopy and both aim for discharge within 24 h. Following publication of evidence that at least 25% of patients presenting with upper GI bleed could be discharged early and safely if given an endoscopy within 24 h of admission,⁴ and reference to this in a BSG Working Party Report on the provision of endoscopy-related services,¹⁰ the protocol at site A recommends early oesophagogastroduodenoscopy (OGD) before discharge, whereas the protocol at site B suggests discharge without endoscopy. Both pathways, summarised in fig 1, can be adapted according to the clinician's discretion, but are based on a Blatchford score of 0 or 1 as one of the parameters for admission to a CDU bed, rather than an inpatient bed. Exclusion criteria are age greater than 60 years, postural fall in systolic blood pressure greater than 20 mm Hg, known oesophageal varices, receiving anticoagulation, and social circumstances that prevent discharge within 24 h. Site A therefore has arrangements in place for endoscopy to be performed on the same day or early the following day to allow rapid discharge. No such arrangements are in place on site B. Because of different protocols existing within the same Trust, it was agreed that these pathways should be audited and hence ethical permission was not needed for data collection. Although data collection at site A was not strictly necessary to allow us to meet the primary objective of this study (ie, to assess the safety

Figure 1 Flow diagram summarising clinical pathway at site A and site B. BP, blood pressure; CDU, clinical decisions unit; GI, gastrointestinal.

of early discharge of patients with low-risk upper GI bleeding without endoscopy), inclusion of the site A data allowed to us to assess the secondary objectives outlined above.

Data collection

Records from all patients admitted to the two CDUs between August 2002 and March 2005, and who had been coded as having been through the "low-risk acute upper GI bleed protocol" were identified. Their notes, patient administration systems, discharge letters and endoscopy records were reviewed to determine: time and date of admission to and discharge from the CDU; whether they had undergone upper GI endoscopy; if they had been readmitted to Leeds Teaching Hospitals Trust within 30 days of initial discharge; whether they were seen in the gastroenterology outpatient clinic within the following 6 months; the post-CDU clinical progress—that is, admitted for further observation, discharged to general practitioner follow-up, discharged to hospital outpatient follow-up or outpatient endoscopy. For those who had undergone endoscopy, the diagnosis was obtained, as was whether a therapeutic procedure was undertaken and, if so, what. Ulcers were classified according to the modified Forrest criteria (as shown in table 2), which categorises ulcers according to endoscopic appearance and gives an indication of rebleeding risk.^{11 12}

Data analysis

Where appropriate, either the Student unpaired *t* test or Fisher exact test was used to compare groups. Statistical analysis was performed using SPSS for Windows V13 (SPSS UK Ltd, Chertsey, Surrey, UK).

Table 2 Modified Forrest criteria for peptic ulcer haemorrhage

Modified Forrest criterion	Rebleeding rate (range) (%)
1. Actively bleeding ulcer	55 (17–100)
1a. Spurting	
1b. Oozing	
2. Non-actively bleeding ulcer	
2a. Non-bleeding visible vessel	43 (0–81)
2b. Ulcer with surface clot	22 (14–36)
2c. Ulcer with red or dark blue spots	10 (0–13)
3. Ulcer with clean base	5 (0–10)

RESULTS

Patients

Over 30 months, 194 (111 male and 83 female) patients with low-risk acute upper GI bleeding and a Blatchford score of 0 or 1 were admitted to the two CDUs. Table 3 summarises the main characteristics of each cohort of patients. The admission criterion of patients being aged less than 60 years was not always adhered to.

Post-CDU clinical progress of patients

Of the 120 patients admitted to site A, two of the 115 who had not had endoscopic therapy were admitted to hospital for further observation compared with 6/74 (8%) from site B ($p = 0.06$). Additional stay in an inpatient bed for the two patients at site A was 4 days each compared with a median of 2 days (range 1–3) for patients admitted to an inpatient bed at site B. The numbers of patients (including those briefly admitted to the in-patient bed base) discharged within 24 h and given hospital clinic follow-up were 8/113 (7%) and 17/68 (25%) ($p < 0.001$). Three patients who did not originally receive endoscopy at site A had endoscopy within 3 months of discharge, compared with 11 at site B ($p = 0.54$). Thirty-day readmission rates were similar at both sites: 6/120 (5%) at site A vs 6/74 (8%) at site B ($p = 0.34$). No patient at either site was readmitted with a significant acute upper GI bleed. One patient died within 30 days of discharge at site B. This was from a known lymphoproliferative disorder.

In-patient events

Median length of stay on the CDU was 12.6 h at site A and 9.4 h at site B ($p = 0.045$). No patient at either site had any surgical intervention or blood transfusion.

Table 4 Main findings at oesophagogastroduodenoscopy performed during the original admission at both sites

Most significant finding	Site A (n = 89)	Site B (n = 7)
Grade A/B oesophagitis only	17	
Grade C/D oesophagitis only	4	
Gastritis only	6	2
Duodenitis only	2	1
Oesophagitis/gastritis/duodenitis combination	11	1
Gastric ulcer	4 (one Forrest class 2C; three class 3)	
Duodenal ulcer	4 (two Forrest class 1B; one class 2C; one class 3)	
Mallory–Weiss tear	19	
Normal	18	1
Other	4	2

Findings such as Barrett's oesophagus and hiatus hernia were classified under "other". Of the 14 patients who did not originally have an endoscopy, but did receive one within 3 months, 10 had findings of oesophagitis and/or gastritis and/or duodenitis at that endoscopy, three had endoscopic findings reported as "other", and one had a duodenal ulcer with no stigmata of recent haemorrhage.

Endoscopic findings and treatment

OGD was performed on 89/120 (74%) patients at site A compared with 7/74 (9%) at site B ($p < 0.001$). Table 4 lists the main findings at OGD for all patients who had an endoscopy during their original admission at both sites. Eight of 89 patients from site A had ulcers, four gastric and four duodenal. Five of these had a clean base with very low risk of further bleeding, whereas three (all duodenal) had stigmata of recent haemorrhage; two were Forrest 1B and one Forrest 2C (table 2). One of the patients with a bleeding duodenal ulcer also had a minor non-bleeding gastric ulcer, but this was not classified as "the major finding".

Of the 89 patients at site A who had OGD, five (two with a Mallory–Weiss tear and three with a duodenal ulcer) had a therapeutic procedure—that is, injection of 1:10 000 adrenaline and/or application of a heater probe. Their median age was 29 years 11 months (range 28 years 11 months to 61 years 6 months). Median length of stay in hospital of these patients was 5 (range 4–6) days. The duodenal ulcer of one of the treated patients was classified as Forrest 2C (ie, haematin-covered flat spot), and the other two as 1B (ie, oozing, bleeding visible vessel). One of the latter patients was 61 years of age, and therefore did not meet the strict criteria for admission to CDU. Of the two Mallory–Weiss tears treated, one was seen to be oozing (no visible vessel) and the other had a visible vessel,

Table 3 Characteristics and clinical progress of each cohort of patients

	Site A (n = 120)	Site B (n = 74)	p Value
Male/female	70/50	41/33	0.77
Age*	30.3 (17.1–71.7)	26.5 (16.5–65.6)	0.015
Age >60 years	4	2	1.0
OGD	89 (74%)	7 (9%)	<0.001
Endoscopic therapy	5	0	0.18
Admitted to inpatient bed with no endoscopic therapy	2 (2%)	6 (8%)	0.06
Blood transfusion	0	0	NA
Discharged direct from CDU, given hospital follow-up appointment	8/112 (7%)	17/62 (27%)	0.0005
Discharged within 24 h, given hospital follow-up appointment	8/114 (7%)	17/68 (25%)	<0.001
OGD within 3/12 (no OGD originally)	3/31 (10%)	11/67 (16%)	0.54
30 day readmission rate	6/120 (5%)	6/74 (8%)	0.34
Stay on CDU (h)*	12.6 (0–23.6)	9.4 (1–22.2)	0.045

*Median (range).

CDU, clinical decisions unit; OGD, oesophagogastroduodenoscopy.

but no active bleeding. No patient at site B had a therapeutic procedure.

DISCUSSION

This retrospective review of protocol-driven care for patients deemed to have low-risk acute upper GI bleeding suggests that it is safe to use a protocol based only on simple clinical and laboratory findings. Endoscopy of a cohort of such patients did not significantly alter the management of the vast majority. The policy at site B not to give an endoscopy to patients with low-risk upper GI bleed within 24 h resulted in longer stays on the CDU and more outpatient consultations after discharge. This may represent the clinicians at site B being too cautious. Reassuringly, these results suggest that the Blatchford score performed similarly to previous published experiences, with only 5/194 (2.6%) of patients with a Blatchford score of ≤ 2 having endoscopic therapy.² It is likely that not all of the five patients treated would have come to harm if they had not had an endoscopy and received treatment, as medical literature quotes that at least 70–80% of non-variceal acute upper GI bleeds will stop spontaneously.^{13,14} Indeed, two of the treated patients had non-bleeding lesions treated, which could be deemed unnecessary. However, we cannot know what would have happened if these patients had not had the examination. Equally, at site B, if a high enough percentage of patients had received endoscopy, then we can speculate that some of these may have been classified for endoscopic treatment, as classification of stigmata of recent haemorrhage is known to differ widely among endoscopists.¹⁵ Although, ideally, all patients would have had a diagnostic endoscopy in a study such as this, the original case ascertainment study for the Blatchford score¹⁶ was also retrospective, and it too was not set up so that everybody admitted for acute upper GI bleeding had a diagnostic endoscopy. Indeed of the 1882 patients in that study, 542 (28.8%) had no diagnosis recorded (and therefore presumably did not have endoscopy).

We acknowledge that this is an audit and not a randomised comparison of two groups and therefore is subject to some bias, especially with regard to the slightly different local populations. As Blatchford *et al*² found that deprivation was associated with an increased incidence of upper GI bleeding (but not fatality), this difference in local populations may be significant. However, both CDU protocols deny admission to patients in whom discharge is unlikely in less than 24 h because of social circumstances, and this will have indirectly excluded patients living in severe deprivation from this study. In a retrospective study such as this, as socioeconomic status is not one of the variables formally assessed on admission to either of the sites, further measurements of deprivation cannot be made. Age was also significantly different between the two groups, with patients at site A being older than those at site B: median

30.3 years (range 17.1–71.7) vs 26.5 (16.6–65.6) ($p < 0.02$). The reason for this is not clear, but we contend that a median difference in age of less than 4 years in such a relatively young age group is not clinically significant. However, one of the patients who was actively bleeding and treated endoscopically was over 60 years of age and therefore should not have been admitted to the CDU. If this patient were excluded from the analyses, our figures would be even more reassuring.

Although these numbers are small in the context of medical admissions to large teaching hospitals, efficient use of resources is to be encouraged at all levels. Avoidance of admission to the in-patient bed base eases pressure on accident and emergency access targets, reduces costs, and prevents hospital-acquired infections for these patients. Furthermore, avoidance of unnecessary urgent in-patient endoscopy, where appropriate, reduces strain on busy endoscopy departments. It would be interesting to compare the costs of the two strategies, but this was not the aim of the study, and cost data (such as indicated by primary care data) are incomplete. However, it is evident that an approach that reduces time in hospital and in-patient endoscopy is likely to be cheaper in the short term at least. Notwithstanding this, future studies examining the full effects on primary care of adopting a “no inpatient endoscopy” policy for this group of patients are necessary. These would also allow full economic assessment of all strategies. There has also been no consideration of whether a “definitive” diagnosis at discharge is preferable or not with regard to patient satisfaction.

In conclusion therefore, this review of protocol-driven care for patients deemed to have low-risk acute upper GI bleeding suggests that it is safe to use a protocol based only on simple clinical and laboratory findings. Use of this protocol allows discharge in less than 24 h, often less than 12 h, and can prevent admission to the general medical bed base. Although early in-patient endoscopy allows diagnosis and treatment, where necessary, giving confidence for early discharge, and is consistent with recommendations from a previous National Audit into acute upper GI haemorrhage conducted in the UK in 1995,⁴ we believe that the use of the extra resources involved does not justify the benefits in this ultra-low-risk group. Avoiding early in-patient endoscopy appears to be safe, although there may be a slight increase in the number of clinic follow-ups. We believe that these can be avoided by ensuring that such patients have an outpatient endoscopy arranged for soon after discharge. Such patients can be grouped together for appropriate lists, which would be less disruptive than the ad hoc policy of giving endoscopies to patients within 24 h of admission for their low-risk upper GI bleed. The early outpatient endoscopy, as well as obviating the need for unnecessary follow-up in both primary and secondary care, would provide a definitive diagnosis and reassure both patient and clinician that no significant lesion, such as malignancy, has been missed. Therefore, we are recommending a change in our protocols: we propose that all patients who fulfil the criteria for a low-risk acute upper GI bleed should be discharged within 24 h, with an outpatient endoscopy to be arranged to take place within the following 2 weeks.

Summary of main findings from this study

- Low-risk suspected upper gastrointestinal bleeds can be safely managed without admission to the inpatient medical bed base.
- Early in-patient endoscopy is not necessary for these patients.
- Not seeking in-patient endoscopy reduces median stay of these patients in hospital.
- The Blatchford score, which is based on readily available clinical and laboratory variables, can be used to identify suitable patients.

Authors' affiliations

G G Robins, M Armstrong, M E Denyer, Department of Gastroenterology, St James's University Hospital, Leeds LS9 7TF, UK

M S Sarwar, Department of Gastroenterology, Victoria Infirmary, Glasgow G42 9TY, UK

S Bush, Department of Emergency Medicine, St James's University Hospital, Leeds LS9 7TF, UK

T Hassan, Department of Emergency Medicine, Leeds General Infirmary, Leeds LS1 3EX, UK

S M Everett, Centre for Digestive Diseases, Leeds General Infirmary, Leeds LS1 3EX, UK

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