

Urgent versus early endoscopy in outcome of upper gastrointestinal bleeding in patients admitted in a tertiary care hospital of Nepal

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Introduction: There is a general consensus that upper gastrointestinal (UGI) endoscopy should be performed within 24 hours in patients presenting with UGI bleeding. However, the optimal timing within this period remains controversial, particularly regarding urgent endoscopy (within 12 hours of hospital presentation) versus early endoscopy (within 12–24 hours). This study aims to evaluate the association between the timing of endoscopy and clinical outcomes in patients with UGI bleeding.

Methods: We conducted a prospective, observational hospital-based study at Patan Hospital, Lalitpur, Nepal after approval from the Institutional Review Board. The study aimed to compare outcomes in UGI bleeding patients undergoing urgent and early endoscopy. Consecutive sampling was employed. Outcomes assessed included in-hospital mortality, need for endoscopic intervention, requirement for repeat endoscopy, blood transfusion, and length of hospital stay in both groups.

Results: A total of 84 patients were enrolled, with 42 patients in each group. Baseline characteristics were comparable between the groups, except for platelet count. Patients undergoing urgent endoscopy required more blood transfusions (76.19% vs. 52.38%, $p = 0.023$). There were no statistically significant differences between the groups in terms of endoscopic intervention, need for repeat endoscopy, or in-hospital mortality. However, the length of hospital stay was significantly shorter in the early endoscopy group (median 5 vs. 6 days, $p = 0.021$).

Conclusions: Patients undergoing urgent endoscopy had higher transfusion requirements and longer hospital stay compared to early endoscopy, with no differences in other outcomes. Further randomized studies are needed to establish definitive recommendation.

Keywords: Endoscopy, Gastrointestinal Hemorrhage, Hematemesis, Melena

Introduction

The annual incidence of hospitalization for acute upper gastrointestinal (UGI) bleeding in the United States is approximately 65 per 100,000 individuals.¹ It has a mortality rate of 7% to 10%.^{2,3} Once a bleeding lesion has been identified, therapeutic procedure can be done to stop bleeding and prevent recurrent bleeding in most patients. Patients should be resuscitated adequately before performing a UGI endoscopy.⁴

There is a common consensus to perform UGI endoscopy in patients presenting with UGI bleed within 24 hours. Benefits of early endoscopy (<24 hours) and increased mortality from delayed endoscopy (>24 hours) were seen in various studies.⁵⁻⁷ There is a controversy regarding urgent (<12 hours) versus early (12-24 hours) endoscopy.⁸⁻¹² Benefits of early endoscopy include early refeeding, earlier provision of endoscopic or medical therapy based on endoscopic findings, and early discharge. The harms that may occur include poor outcomes (death or complications) if endoscopy is performed before appropriate hemodynamic resuscitation and management of active co-morbidities

In resource-limited settings such as Nepal, patients with upper gastrointestinal (UGI) bleeding are often referred for urgent endoscopy from primary care centers without adequate resuscitation, potentially leading to adverse outcomes. The optimal timing of endoscopic intervention in UGI bleeding

Article History

Received on - 2026 Feb 22
Accepted on - 2026 May 15

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Citation: Acharya U, Dahal A, Karki S, Sharma Y. Urgent versus early endoscopy in outcome of upper gastrointestinal bleeding in patients admitted in a tertiary care hospital of Nepal. JNSG 2026;1(1):6-10.

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Online Access



DOI:

remains a subject of considerable debate and to the best of our knowledge, comparable studies evaluating urgent versus early endoscopy in this setting are lacking. This study aims to evaluate the association between endoscopy timing and clinical outcomes in patients with UGI bleeding.

Methods

This was a prospective observational study done at Patan Hospital, Lagankhel, Lalitpur, Nepal from May 2022 to September 2023. The approval was taken from the Institutional Review Board via letter no PMM2205101613. The general objective of the study was to compare outcomes of patients with upper gastrointestinal bleeding, undergoing endoscopy within 12 hours (urgent) and between 12-24 hours (early) of presentation to the hospital. The specific objectives were to find out association of timing of endoscopy with different outcomes i.e blood transfusion requirements, the endoscopic intervention, the re-endoscopy rates, the length of hospital stay and death.

Patients aged 14 years or older who were admitted to Patan Hospital with upper gastrointestinal bleeding, defined as presentation with hematemesis, melena, or both, were eligible for inclusion. Patients were excluded if endoscopy was performed more than 24 hours after initial presentation, or if hemodynamic instability persisted following initial intravenous fluid resuscitation, defined as a mean arterial pressure below 60 mmHg.

Data of the patient presenting with UGI bleeding in OPD and Emergency department of Patan Hospital fulfilling the inclusion criteria was collected after obtaining written informed consent from the patient (participant). Data collection started from the first presentation of the patient in the Emergency department or OPD in which the clinical findings and required lab value was noted in structured proforma. Endoscopy timing was defined as the interval between the patient's arrival at the hospital and the commencement of endoscopy, the latter being recorded from the endoscopy room logbook. In accordance with the current European Society of Gastrointestinal Endoscopy (ESGE) guidelines, endoscopy was classified as urgent if performed within 12 hours of presentation, and early if performed between 12 and 24 hours of presentation. Participants were followed regularly during their hospital stay, till discharge or death of the patient. The patient's chart was also reviewed regularly and the required data collected.

Sample size was calculated based on findings from a study conducted in Portugal, which reported blood transfusion rates of 32.8% and 63.4% in the urgent and early endoscopy groups, respectively. Using the Kelsey formula, a total of 84 participants (42 per group) was determined, and consecutive sampling was employed.⁸

Data were entered into Microsoft Excel and EPI-INFO for analysis. Continuous variables (age, initial hemoglobin level, and length of hospital stay) were non-normally distributed and are presented as median with interquartile range (IQR). Categorical variables (in-hospital mortality, requirement of endoscopic intervention, re-endoscopy, and blood transfusion requirement) are presented as counts and percentages. Between-group comparisons were performed using the median test for continuous variables and the chi-square test for categorical variables. A p-value of less than

0.05 was considered statistically significant.

Results

A total of 179 patients were assessed for eligibility, of whom 95 were excluded due to endoscopy performed beyond 24 hours of presentation, persistent hemodynamic instability following resuscitation, or discharge against medical advice. The remaining 84 patients were enrolled and allocated equally into the urgent endoscopy group (n = 42) and the early endoscopy group (n = 42) (Figure 1).

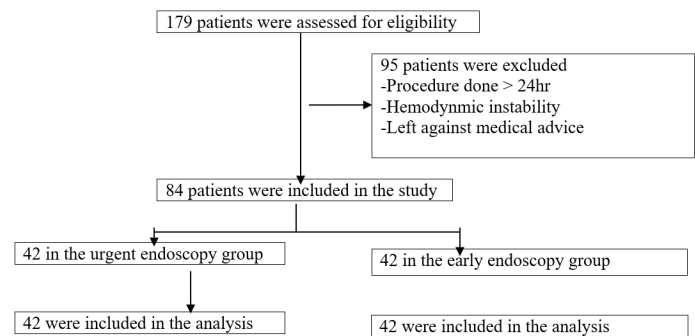
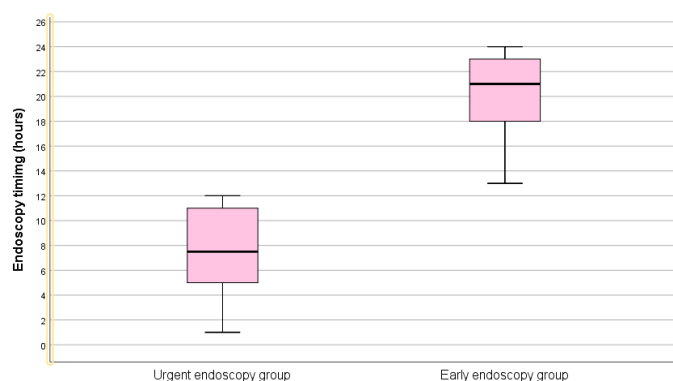


Figure 1: Flow Chart of Study Selection

The baseline characteristics of patients in the urgent and early endoscopy groups are summarized in Table 1. The two groups were broadly comparable across most demographic and clinical parameters. The median age was 48.5 years (IQR 36.75–60.25) in the urgent endoscopy group and 52.5 years (IQR 41.7–62.25) in the early endoscopy group, with no statistically significant difference ($p = 0.275$). Male sex predominated in both groups, accounting for 52.38% and 66.67% of patients in the urgent and early endoscopy groups, respectively ($p = 0.182$). Median endoscopy timing was 7.5 hours (IQR 4.75–11.00) in the urgent group and 21 hours (IQR 18–23) in the early group. The etiology of bleeding, initial systolic blood pressure, heart rate, blood urea, serum creatinine, hemoglobin, and INR were similarly distributed between the two groups, with no statistically significant differences observed. Variceal bleeding was the most common etiology identified at first endoscopy in both groups. The only statistically significant difference at baseline was platelet count, which was higher in the urgent endoscopy group compared to the early endoscopy group (174k, IQR 138k–247k versus 149.5k, IQR 117.75–220.25k; $p = 0.033$).

Table 1: Baseline characteristics of study population

Characteristics	Urgent-endoscopy group (n=42)	Early-endoscopy group (n=42)	p-value
Age in years –median(IQR)	48.5(36.75-60.25)	52.5(41.7-62.25)	0.275
Male sex- no. (%)	22(52.38%)	28(66.67%)	0.182
Endoscopy timing –median(IQR)	7.5(4.75-11.00)	21(18-23)	
Etiology of bleeding (at first endoscopy): no. (%)			
1. Variceal bleed	17(40.47%)	18(42.85%)	0.826
2. Non-variceal bleed	16(38.09%)	21(50%)	0.275
3. Normal endoscopy	6(14.28%)	3(7.14%)	0.293
4. Not localized	3(7.14%)	0(0%)	0.079
Initial systolic blood pressure (mm of Hg)- median(IQR)	100(90-120)	110(100-120)	0.383
Initial heart rate (bpm)- median(IQR)	99(88-108.5)	98(87.5-106.75)	0.827
Blood urea (mg/dl)- median(IQR)	37.5(17.75-60.0)	30.5(20.5-83.5)	0.377
Serum creatinine (mg/dl)- median(IQR)	0.75(0.5-1.1)	0.8(0.6-1.2)	0.860
Hemoglobin (g%) - median(IQR)	7.35(6.65-10.5)	8.65(6.7-11.725)	0.383
Platelets (per mm ³)- median(IQR)	174k(138k-247k)	149.5k(117.75k-220.25k)	0.033
INR- median(IQR)	1.32(1.12-1.56)	1.37(1.11-1.69)	0.569

**Figure 2:** Box plot showing the distribution of endoscopy timing in the urgent and early endoscopy groups.

The median time from hospital presentation to endoscopy was

7.5 hours (IQR 4.75–11.00) in the urgent endoscopy group and 21 hours (IQR 18–23) in the early endoscopy group (Figure 2). The box plots demonstrate a clear and non-overlapping separation between the two groups.

As shown in Table 2, the proportion of patients requiring blood transfusion was significantly higher in the urgent endoscopy group compared to the early endoscopy group (76.19% versus 52.38%; $p = 0.02$). The rates of endoscopic intervention (40.47% versus 26.19%; $p = 0.16$), re-endoscopy (21.41% versus 14.28%; $p = 0.39$), and in-hospital mortality (2.38% versus 2.38%; $p = 1.00$) were comparable between the two groups, with no statistically significant differences observed. However, the length of hospital stay was significantly longer in the urgent endoscopy group than in the early endoscopy group, with a median of 6 days (IQR 4–8.25) versus 5 days (IQR 3–6), respectively ($p = 0.021$).

Table 2: Comparison of clinical outcomes between the urgent and early endoscopy groups.

Outcome	Urgent-endoscopy group (n=42)	Early-endoscopy group (n=42)	p-value
Blood transfusion- no. (%)	32(76.19%)	22(52.38%)	0.02
Endoscopic intervention (%)	17(40.47%)	11(26.19%)	0.16
Re-endoscopy (%)	9(21.41)	6(14.28)	0.39
1. For endoscopic intervention (%)	4(44.44%)	6(100%)	
2. For re-intervention (%)	1(11.11%)	0(0%)	
3. For difficulty in localization at previous endoscopy (%)	4(44.44%)	0(0%)	
Number of in-hospital deaths (%)	1(2.38%)	1(2.38%)	1.00
Length of hospital stay in days- median (interquartile range)	6(4-8.25)	5(3-6)	0.02

Discussion

The median ages in both groups were comparable, consistent with the well established observation that upper GI bleeding is more prevalent in older individuals, among whom peptic ulcers, varices, and gastrointestinal malignancies are more common. The etiology of bleeding in both groups were similarly distributed, with the proportion of variceal bleeding comparable to that reported in other studies conducted in similar settings.^{14,15} Normal endoscopy findings were recorded in nine of the patients, six in the urgent and three in the early endoscopy group, which could

be attributed due to healed superficial lesions, Duodalafoys's lesion, bleeding from small bowel distal to duodenum, or swallowed hemoptysis.¹⁰ The serum creatinine levels in both groups were similar aligning with the finding from prior literature.¹⁶

In this study, the requirement of blood transfusion and length of hospital stay in patients with upper GI bleeding varied with the timing of endoscopy. Patients who underwent endoscopy within 12 hours of presentation had a higher transfusion requirement than those who underwent endoscopy between 12 and 24 hours, and this difference reached statistical significance. Since this was

non-randomized study in which the timing of endoscopy was decided by the treating physician or gastroenterologist, selection bias can not be excluded. Patients with more severe bleeding — and correspondingly worse hemodynamic parameters — may have been preferentially triaged to earlier endoscopy, thereby accounting for the higher transfusion rates and longer hospital stays observed in the urgent endoscopy group. Randomized controlled studies would provide more robust information in this regard. The patients undergoing urgent endoscopy had an increased length of hospital stay probably due to higher rate of difficulty in localizing lesions during the first endoscopy in this group and, as a result requiring re-look endoscopy.

Although the etiology of bleeding (the proportion of variceal, non-variceal, and normal endoscopy) did not differ significantly between the two groups, clinical outcomes following urgent versus early endoscopy may vary depending on whether the underlying cause is variceal or non-variceal. Sub-group analysis between those with variceal and non-variceal bleeding in outcomes would have yielded more information, as various guidelines recommend different timing of endoscopy for variceal and non-variceal bleeding.¹⁷⁻²¹

The endoscopic intervention rate was higher in the urgent endoscopy group, though this did not reach statistical significance.. Lesions that were actively bleeding may have resulted in more frequent endoscopic intervention. A similar previous study showed that in patients who had earlier endoscopy, there was a greater probability of detecting high-risk bleeding lesions, hence a higher rate of endoscopic intervention, but the outcome showed no difference in both the groups.²² The longer duration of acid suppression in the early endoscopy group than in the urgent endoscopy group led to reduction in number of ulcers with active bleeding and major stigmata, reducing the need for endoscopic treatment. This is supported by a randomized controlled trial demonstrating that pre-endoscopic high-dose proton pump inhibitor therapy promotes resolution of bleeding signs in peptic ulcers and decreases the requirement for endoscopic treatment.²³

In our study, there was no significant difference between the urgent and early endoscopy group with regard to in hospital mortality. This is low as compared to other studies.^{6,7} It could be because we excluded the patients whose condition could not be stabilized after initial resuscitation. Similarly, the patients in whom UGI endoscopy was done after 24 hours were not included in this study. This might be the reason for higher number of mortality in other studies h.⁵⁻⁷

Although re-endoscopy rates were higher in the urgent endoscopy group compared to the early endoscopy group (21.41% versus 14.28%; $p = 0.393$), this difference did not reach statistical significance. Notably, difficulty in lesion localization at the index endoscopy accounted for 44.44% of re-endoscopies in the urgent group, whereas no such cases were recorded in the early endoscopy group, suggesting that suboptimal visualization in the setting of active bleeding may have contributed to this finding. Several limitations of this study warrant acknowledgment. In this study, we did not stratify patients according to the severity of bleeding. The use of prognostic scores for acute UGI bleeding would have helped to stratify patients according to the severity of bleeding and identify the group in which the timing of endoscopy

could predict the patient's outcome more accurately. The non-randomized, observational design introduces the possibility of selection bias, as the decision to perform urgent endoscopy was at the discretion of the treating clinician and may have been influenced by bleeding severity. This study was done in a single center. Multi-center studies with a larger number of participants, different geographic locations, inclusion of a wider range of population groups, and the ability to compare results among centers would have given more valuable information. The patients were not stratified according to the severity of bleeding. Furthermore, subgroup analyses based on bleeding etiology and severity were not performed, which may have obscured differential effects of endoscopy timing across these clinically distinct patient groups.

Conclusion

In hemodynamically stable patients with upper gastrointestinal bleeding following initial resuscitation, urgent endoscopy was associated with significantly longer hospital stay and higher blood transfusion requirements compared to early endoscopy. No statistically significant differences were observed between the two groups with respect to endoscopic intervention, re-endoscopy rates, or in-hospital mortality.

Declarations: None

Funding: None

Conflict of interest: None

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