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Upper Gastrointestinal Bleeding in Geriatric and Young Patients: Evaluation of Clinical and Endoscopic Findings

Geriatrik ve Genç Hastalarda Üst Gastrointestinal Kanama: Klinik ve Endoskopik Bulguların Değerlendirilmesi

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Upper Gastrointestinal Bleeding in Geriatric and Young Patients: Evaluation of Clinical and Endoscopic Findings

ABSTRACT

Objective: Acute upper gastrointestinal (GI) bleeding causes significant mortality and morbidity and can be life-threatening. This study aimed to compare the clinical-endoscopic characteristics and outcomes of patients aged <65 and ≥65 years who presented with upper GI bleeding.

Material and Method: A total of 412 patients who underwent endoscopic procedures for GI bleeding were included. The clinical and endoscopic characteristics, treatments, and hospital stays of the patients were retrospectively reviewed from the hospital system and recorded. The results were compared by dividing the patients into two groups: those aged <65 years and those aged ≥65 years.

Results: There were 244 patients aged ≥65 years and 168 patients aged <65 years. Male sex was predominant in both groups. Comorbidities were significantly more common in geriatric patients. Nonsteroidal anti-inflammatory drugs (NSAID) use was similar between the two groups. The etiologies of bleeding were similar in both groups, with peptic ulcers being the most common cause. The need for erythrocyte transfusion was increased in the geriatric group, and the length of hospital stay was significantly longer in the ≥65 years age group. There was no statistically significant difference in in-hospital mortality rates between the two groups.

Conclusion: Peptic ulcer was the most common etiology in both the groups. NSAID use was recognized as an important risk factor for bleeding in both the groups. Older age and the presence of comorbid diseases were thought to be the main factors affecting length of hospital stay and erythrocyte transfusion needs. Age alone was not considered a factor that increased in-hospital mortality.

Keywords: Age, comorbidity, mortality, upper gastrointestinal bleeding.

ÖZET

Amaç: Akut üst gastrointestinal (Gİ) kanama, önemli oranda mortalite ve morbiditeye neden olur ve potansiyel olarak yaşamı tehdit edebilir. Bu çalışmada üst Gİ kanama nedeniyle başvuran <65 yaş ve ≥65 yaş hastalarda klinik-endoskopik özellikler ve sonuçların karşılaştırılması amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya Gİ kanama nedeniyle endoskopik işlem yapılan 412 hasta alındı. Hastaların klinik ve endoskopik özellikleri, tedavileri ve yatış süreleri retrospektif olarak hastane sisteminden taranarak kaydedildi. <65 yaş ve ≥65 yaş hastalar olarak iki gruba ayrılarak sonuçlar karşılaştırıldı.

Bulgular: Toplamda ≥65 yaş 244 hasta, <65 yaş 168 hasta mevcuttu. Her iki grupta da erkek cinsiyet baskındı. Komorbid hastalıklar geriatrik grupta anlamlı şekilde daha fazlaydı. Nonsteroidal anti-inflamatuvar ilaç (NSAİİ) kullanımı iki grupta benzerdi. Kanama etiyolojileri iki grupta benzerdi, en sık sebep peptik ülser idi. Eritrosit transfüzyon ihtiyacı geriatrik grupta daha fazla idi, hastanede yatış süresi ≥65 yaş grubunda istatistiksel anlamlı şekilde daha uzundu. İki grup arasında hastane içi mortalite oranları arasında istatistiksel olarak anlamlı fark yoktu.

Sonuç: Hastalarımızda her iki grupta da en sık üst Gİ kanama sebebi peptik ülser olarak bulunmuştur. NSAİİ kullanım öyküsü, iki grupta da kanamada önemli bir risk faktörü olarak saptandı. Hastaların hastanede yatış süresini ve eritrosit transfüzyon ihtiyacını etkileyen faktörlerin başında, ileri yaş ve komorbid hastalık varlığı geldiği düşünüldü. Yaşın tek başına hastane içi mortaliteyi artıran bir faktör olmadığı düşünüldü.

Anahtar Sözcükler: Komorbidite, mortalite, üst gastrointestinal kanama, yaş.

Introduction

Upper gastrointestinal (GI) bleeding is a common, potentially life-threatening condition. It originates in the esophagus, stomach, or duodenum, proximal to the ligament of Trietz. It may present with hematemesis and melena, or hematochezia may also be present in cases of severe bleeding (1). It can be acute, occult, or obstructive. In addition to bleeding, patients may also experience symptoms of blood and fluid loss, such as syncope, weakness, and dyspnea (2).

Upper GI bleeding constitutes approximately 75% of all acute GI bleeding cases. Although its incidence varies globally and regionally, it is approximately 80-150 per 100,000 annually, with estimated mortality rates ranging between 2-15% (3). Mortality is associated with age, and studies have reported higher mortality in individuals over 60 years of age (4). Various studies have shown that factors other than age, such as hemodynamic instability, hypotension, low hematocrit, and low albumin levels, are independent predictors of mortality (5,6).

Among the causes of upper GI bleeding, peptic ulcer disease accounts for 40-50% of cases. Most (30%) of these patients had duodenal ulcers. It is usually associated with nonsteroidal anti-inflammatory drugs (NSAIDs), Helicobacter pylori (H. pylori), and stress-related mucosal diseases (7). In addition to peptic ulcers, erosive esophagitis (11%), duodenitis (10%), varices (5-30%) (depending on whether the population included in the study had chronic liver disease), Mallory-Weiss lesions (5-15%), and vascular malformations (5%) are other common causes of upper GI bleeding (3).

In approximately 80-85% of patients with upper GI bleeding, bleeding resolves spontaneously without complications (8). However, recurrent and life-threatening bleeding can occur in the remaining cases, requiring additional endoscopic interventions or, if uncontrolled, interventional radiological and surgical treatment.

Approximately 70% of acute upper GI bleeding cases occur in individuals > 60 years of age, and the incidence increases with age. Older age is identified as a risk factor for mortality in patients presenting with upper GI bleeding, likely due to the higher prevalence of comorbidities, such as pulmonary and cardiovascular diseases, in older patients than in younger patients (9).

This study aimed to compare the clinical, laboratory, and endoscopic characteristics of patients presenting with acute upper gastrointestinal (GI) bleeding based on age groups (≥65 years and <65 years) and to evaluate how these differences influence the management of bleeding. Considering that peptic ulcer is the most common cause in both age groups, this study sought to understand the impact of age-related comorbidities and medications on bleeding. Additionally, the length of hospital stay and erythrocyte transfusion requirements were evaluated to investigate how these findings can be integrated into clinical management strategies. This study aimed to determine whether older age and associated comorbidities are critical factors in determining bleeding outcomes. In this context, the findings are expected to contribute significantly to optimizing age-specific management approaches and improving health care delivery.

Material and Method

This study included patients aged ≥ 18 years who presented with symptoms of upper gastrointestinal bleeding and underwent endoscopy at Aksaray Training and Research Hospital between February 2022 and October 2023. Endoscopy was performed in patients with hematemesis, melena, or hematochezia, after hemodynamic stabilization. Three patients with missing data in their files, 17 patients who did not undergo endoscopy, and five patients who were discharged at their own request were excluded from the study (Figure I). Approval for the study was obtained from the Clinical Research Ethics Committee of University (Decision no: 2023/23-34, Date: 07.12.2023, Number: 153-SBKAEK) and was conducted in accordance with the principles of the Declaration of Helsinki. Patient files were retrospectively scanned. Demographic characteristics, laboratory values, comorbid diseases, medications used, and endoscopy reports of the 412 patients included in the study were examined. The length of the hospital stay and mortality due to bleeding were also recorded.

Figure I. Flowchart of the study

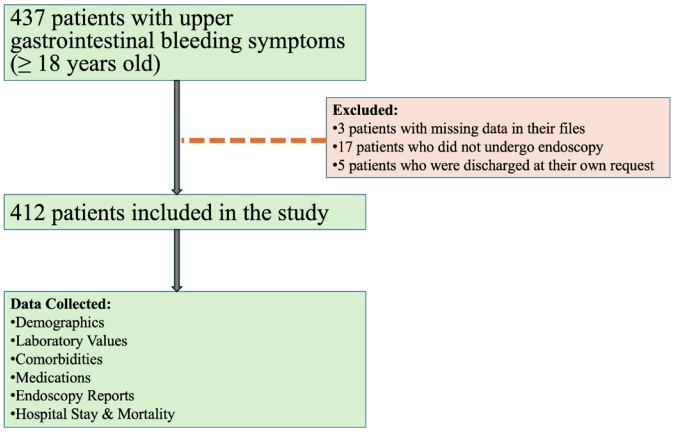
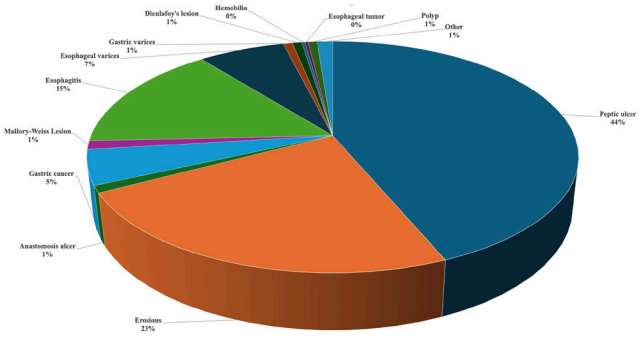


Figure II. Etiologies of Upper Gastrointestinal Bleeding



SPSS version 29.0 was used for statistical analyses. Descriptive statistics were presented as numbers (n) and percentages (%). For quantitative data, mean and standard deviation were given for normally distributed data, and median and minimum-maximum values were given for non-normally distributed data. Comparisons of categorical variables between the groups were performed using the Chi-square or Fisher's exact test. To compare continuous variables in two independent groups, Student's t-test was used when the assumption of normal distribution was met, and the Mann-Whitney U test was used when the assumption of normal distribution was not met. Type 1 error margin (alpha) was accepted as 0.05 for all statistics.

Results

This study included 412 patients, 157 females and 255 males, with an average age of 69 years. Of these, 244 were aged ≥65 years, and 168 were aged <65 years. Most patients presented with melena. The percentage of patients who smoked and consumed alcohol was 18.4% and 3.6%, respectively. Erythrocyte transfusion was administered to 44.7% of the patients. Comorbid conditions were present in 76.9% of patients, with hypertension, cardiovascular diseases, and diabetes mellitus being the most common. Among the medications that increased the bleeding risk, NSAID use was the most common. Table I presents the demographic and laboratory characteristics of the patients.

Peptic ulcer was the most common cause of upper GI bleeding, followed by erosion, esophagitis, and esophageal variceal bleeding (Figure II).

Table I. Demographic Characteristics of Patients

Variable	n (%) or median (min-max)
Age (years)	69 (18-96)
≥65 years	244 (59.2)
<65 years	168 (40.8)
Sex	
Female	157 (38.1)
Male	255 (61.9)
Smoking use	76 (18.4)
Alcohol use	15 (3.6)
Presentation	
Melena	262 (63.6)
Hematemesis	148 (35.9)
Hematochezia	2 (0.5)
Hemoglobin (on admission) (g/dL)	10 (3.8-17.9)
Urea (on admission) (mg/dL)	58 (8-478)
Number of Patients Receiving Erythrocyte Transfusion	184 (44.7)
Presence of Comorbidities	317 (76.9)
Cardiovascular Disease	137 (33.3)
HT	187 (45.4)
DM	112 (27.2)
Liver cirrhosis	31 (7.5)
Atrial Fibrillation/Heart Valve Replacement	60 (14.6)
COPD/Asthma	51 (12.4)
CKD	51 (12.4)
Stroke	25 (6.1)
Other	76 (18.4)
Medication use	281 (68.2)
NSAIDs	145 (35.2)
Aspirin	124 (30.1)
Other antiplatelets	36 (8.7)
NOAC	38 (9.2)
Warfarin	27 (6.6)
Steroids	2 (0.5)

Abbreviations: CKD, Chronic Kidney Disease; COPD, Chronic Obstructive Pulmonary Disease; DM, Diabetes Mellitus; HT, Hypertension; NOAC, New Oral Anticoagulants; NSAIDs, Non-Steroidal Anti-Inflammatory Drugs

Table II. Comparison of Geriatric and Young Populations

Variable	n (%)[a] or mean ±SD/ median (min-max)		*p-value*
	<65 years (n=168)	≥65 years (n=244)	
Sex			*0.002*[b]
Female	49 (29.2)	108 (44.3)	
Male	119 (70.8)	136 (55.7)	
Smoking use	65 (38.7)	11 (4.5)	*<0.001*[b]
Alcohol use	15 (8.9)	-	*<0.001*[b]
Presentation			*0.001*[c]
Melena	92 (54.8)	170 (69.7)	
Hematemesis	76 (45.2)	72 (29.5)	
Hematochezia	-	2 (0.8)	
Hemoglobin mean±SD	11.5±3.2	9.4±2.8	*<0.001*[d]
Urea median (min-max)	45 (8-321)	91.6 (13-478)	*<0.001*[e]
Erythrocyte transfusion	48 (28.6)	136 (55.7)	*<0.001*[b]
Presence of Comorbidities	86 (51.2)	231 (94.7)	*<0.001*[b]
Cardiovascular Disease	25 (14.9)	112 (45.9)	*<0.001*[b]
HT	32 (19.0)	155 (63.5)	*<0.001*[b]
DM	31 (18.5)	81 (33.2)	*<0.001*[b]
Liver cirrhosis	17 (10.1)	14 (5.7)	*0.098*[b]
Atrial Fibrillation/Heart Valve Replacement	2 (1.2)	58 (23.8)	*<0.001*[b]
COPD/Asthma	9 (5.4)	42 (17.2)	*<0.001*[b]
CKD	10 (6.0)	41 (16.8)	*0.001*[b]
Stroke	4 (2.4)	21 (8.6)	*0.009*[b]
Other	23 (13.7)	53 (21.7)	*0.039*[b]
Medication use	85 (50.6)	196 (80.3)	*<0.001*[b]
NSAIDs	62 (36.9)	83 (34.0)	*0.546*[b]
Aspirin	28 (16.7)	96 (39.3)	*<0.001*[b]
Other antiplatelets	14 (8.3)	22 (9.0)	*0809*[b]
NOAC	-	38 (15.6)	*<0.001*[b]
Warfarin	3 (1.8)	24 (9.8)	*0.001*[b]
Steroids	-	2 (0.8)	*0.516*[c]
Etiology			*0.224*[c]
Peptic ulcer	66 (39.3)	114 (46.7)	
Erosive gastritis	40 (23.8)	57 (23.4)	
Anastomotic ulcer	2 (1.2)	2 (0.8)	
Gastric cancer	9 (5.4)	11 (4.5)	
Mallory-Weiss tear	2 (1.2)	3 (1.2)	
Esophagitis	24 (14.3)	38 (15.6)	
Esophageal varices	16 (9.5)	12 (4.9)	
Gastric varices	2 (1.2)	1 (0.4)	
Dieulafoy lesion	3 (1.8)	-	
Hemobilia	1 (0.6)	-	
Esophageal tumor	-	1 (0.4)	
Polyp	-	3 (1.2)	
Other	3 (1.8)	2 (0.8)	
Ulcer location			*0.002*[b]
Duodenal ulcer	51 (77.3)	62 (54.4)	
Gastric ulcer	15 (22.7)	52 (45.6)	
Forrest Classification (n=180)			*0.089*[c]
Forrest 1A	1 (1.5)	1 (0.9)	
Forrest 1B	1 (1.5)	4 (3.5)	

Forrest 2A	3 (4.5)	1 (0.9)	
Forrest 2B	-	6 (5.3)	
Forrest 2C	25 (37.9)	53 (46.5)	
Forrest 3	36 (54.5)	49 (43.0)	
Endoscopic Treatment	21 (12.5)	23 (9.4)	*0.321*[b]
Sclerotherapy	7 (4.2)	9 (3.7)	*0.805*[b]
Hemoclip	11 (6.5)	12 (4.9)	*0.479*[c]
Band ligation	9 (5.4)	6 (2.5)	*0.123*[b]
Argon/Heater	2 (1.2)	2 (0.8)	*1.000*[c]
Sclerotherapy+Hemoclip	7 (4.2)	6 (2.5)	*0.330*[b]
Sclerotherapy+Argon/Heater	1 (0.6)	2 (0.8)	*1.000*[c]
Interventional Radiology	-	3 (1.2)	*0.274*[c]
Surgery	3 (1.8)	-	*0.067*[c]
Other	4 (2.4)	4 (1.6)	*0.721*[c]
Length of Hospital Stay Median (min-max)	2 (0-12)	3 (0-22)	*<0.001*[e]
Mortality	2 (1.2)	7 (2.9)	*0.320*[c]

Abbreviations: CKD, Chronic Kidney Disease; COPD, Chronic Obstructive Pulmonary Disease; DM, Diabetes Mellitus; HT, Hypertension; NOAC, New Oral Anticoagulants; NSAIDs, Non-Steroidal Anti-Inflammatory Drugs
[a] Column percentage [b] Pearson Chi-square test [c] Fisher Exact test [d] Student T test [e] Mann-Whitney U test

In both groups, males were dominant in the geriatric and young populations. Smoking and alcohol consumption were significantly higher in the younger population (*p<0.001*). In both groups, the presentation type was melena, which was significantly more obvious, especially in the geriatric population, than other bleeding presentations. Hemoglobin levels were significantly lower, and urea levels were higher in the geriatric population, and the need for erythrocyte transfusion was more obvious in the geriatric population. Comorbid diseases were significantly more common in the geriatric group. Although NSAID use was similar in both groups, aspirin, new oral anticoagulants, and warfarin were more frequently used in the geriatric population. The etiologies of bleeding were similar in both groups. There was no difference between the groups in terms of the Forrest classification in patients with upper GI bleeding due to peptic ulcers. The endoscopic hemostatic treatments applied to the patients were similar in both groups. The length of the hospital stay was longer in the geriatric population. Mortality rates were similar in both the groups. Information regarding the comparison of geriatric and youth population data is presented in Table II.

Discussion

Despite advances in diagnostic and therapeutic approaches, GI bleeding remains a significant cause of morbidity and mortality. In the United States, although the mortality rate from upper GI bleeding has decreased, it still leads to 300,000 hospital admissions annually and an economic burden of 3.3 billion dollars (10, 11). Therefore, it is crucial to investigate and mitigate the factors that increase the risk of bleeding.

Upper GI bleeding is most commonly observed in the geriatric population. In our study, bleeding frequency was also higher in patients aged ≥65 years. This prevalence in the geriatric population is thought to be due to factors such as the increased use of NSAIDs and other toxic medications with age and the higher incidence of H. pylori and gastroesophageal reflux disease in older adults (12).

Endoscopy is the best method for diagnosing and treating upper GI bleeding. Early (≤24 hours) GI endoscopy following hemodynamic resuscitation is recommended for suspected cases of bleeding (13). The most common cause of upper GI bleeding identified on endoscopy is peptic ulcer disease, which accounts for approximately 40% of all hospitalizations (14). Other common causes include esophagitis (24%), gastritis or gastric erosions (18-22%), duodenitis (13%), and variceal bleeding (11%). Additionally, malignancies, Dieulafoy's lesions, and Mallory-Weiss lesions are among the most frequent causes (15). The frequency ranking may vary based on region and geography. Studies from Türkiye have also reported peptic ulcers as the most common cause of upper GI bleeding (16-20). In our study, peptic ulcers (44%)

were the most common cause of bleeding in all patients, consistent with the literature, followed by erosions (23%), esophagitis (15%), and esophageal varices (7%). Duodenal ulcers were more common than gastric ulcers. Western sources indicate that gastric ulcers are more common than duodenal ulcers, which may be explained by the higher prevalence of H. pylori in our country and its stronger association with duodenal ulcers (21).

In both groups, the causes of bleeding were similar. Peptic ulcer was the most common cause of bleeding in both the groups. According to the localization of peptic ulcers, duodenal ulcers were more common than gastric ulcers in both the groups. Duodenal ulcers were significantly more common in the young group than in the geriatric group. Disruption of the balance between aggressive factors affecting the mucosa and defensive mechanisms protecting the mucosa plays a role in the development of peptic ulcers (22). An increase in aggressive factors often leads to the development of duodenal ulcers, while a decrease in defensive mechanisms frequently leads to the development of gastric ulcers (23). In our study, smoking and alcohol use, which are known to negatively affect both defensive and aggressive factors and primarily lead to the development of gastric ulcers in the young population (23), were significantly more common than in the geriatric population. However, duodenal ulcers were more common in contrast. The presence of H. pylori was not evaluated in this study. This situation may be interpreted as the possibility that H. pylori is more prevalent in the younger group. H. pylori infection frequently causes duodenal ulcer development (24). In addition, although the use of NSAIDs, which are the most common agents causing peptic ulcers, was similar in both groups, comorbid diseases were more common in the geriatric group. The use of aspirin, warfarin, and new oral anticoagulants was more common in the geriatric group. All these factors may lead to ulcer development by affecting the aggressive and defensive factors of the mucosa in various ways and may have affected ulcer localization.

The literature suggests that upper GI bleeding is generally more common in males (25). In our study, bleeding was more frequent in men than in women in both the <65 and ≥65 years age groups, particularly in the younger population. This difference may be due to higher estrogen levels in women, which are thought to increase vascularization and proliferation of the gastric mucosa (26). In the geriatric population, estrogen levels decrease after menopause, bringing the male-to-female ratio closer together, thus supporting this information.

The most common presentation in patients with upper GI bleeding was melena. Especially in the geriatric population, melena was observed at a significantly higher rate than hematemesis. In the laboratory, it was observed that the mean hemoglobin levels were lower and urea levels were higher in the geriatric population than in the young group. The need for erythrocyte transfusion was also significantly higher in the geriatric group than that in the young group. The use of risky drugs and the higher presence of comorbid diseases in the elderly population, which led to the need for earlier erythrocyte transfusion, may have contributed to this. Guidelines also recommend a restrictive transfusion strategy in hemodynamically stable patients with acute upper GI bleeding and no history of cardiovascular disease, and it is recommended to consider replacement if the hemoglobin level is ≤7 g/dL. In contrast, in hemodynamically stable patients with a history of cardiovascular disease, the hemoglobin threshold was determined to be 8 g/dL, and the target hemoglobin concentration was ≥ 10 g/dL (13). The patients in our study received erythrocyte transfusions in accordance with literature. Endoscopic treatments applied in both groups were similar, regardless of the patient's age. Approximately 10% of patients in both the young and geriatric groups underwent endoscopic treatment. The most commonly applied treatments included sclerotherapy, hemoclips, and their combinations, which were similarly frequent in both the groups. In addition, treatments such as band ligation, argon/heater, interventional radiological, and surgical procedures applied according to bleeding etiology were similar, regardless of age. The literature emphasizes the necessity of selecting and applying endoscopic hemostasis methods based on patient indications (27). Koruk et al. compared endoscopic treatments in patients with non-variceal upper GI bleeding and, similar to our study, found that sclerotherapy,

thermal treatments, and hemoclips, either alone or in combination, were the most commonly applied treatments (28). Köseoğlu et al. demonstrated the effectiveness of clip methods in controlling bleeding in patients with nonvariceal upper GI bleeding (29). We believe that endoscopic treatment selection for bleeding control should prioritize the etiology over age, and that the most appropriate endoscopic hemostasis technique should be chosen and used according to local resources. In our study, age did not influence selection.

The literature provides conflicting results on the mortality rates from acute upper GI bleeding in geriatric and young populations. Data from one study showed that patients over 70 years of age had a 20-30 times higher incidence of GI bleeding than those under 30 years of age. Additionally, mortality rates were 12-25% in patients over 60 years of age and less than 10% in patients under 60 years of age (5). In a study by Nahon et al., which examined 3,287 patients with upper GI bleeding, patients aged > 75 years were compared, and the in-hospital mortality rates were found to be similar regardless of etiology (30). In a study by Özveren et al., the mortality rate for upper GI bleeding in patients aged ≥ 65 years was 8.4%. When examined according to age groups, mortality rates were 5% in those aged 65-74, 6.5% in those aged 75-84, and 29.6% in those aged ≥ 85 years (31). In a study by Segal et al., patients aged ≥ 60 years did not show significant differences from those aged < 60 years in terms of intensive care needs, transfusion requirements, hospital stay duration, and mortality (32). In another study by Kır et al., age alone was not found to be an independent risk factor for mortality (33). In our study, the total mortality rate was approximately 2.2%, and there was no significant difference in mortality between the young and geriatric groups. Based on these data, it can be concluded that age alone is not a factor affecting mortality. However, the length of hospital stay was significantly longer in the geriatric population than in the younger group. This may be because of the higher prevalence of comorbid diseases in the geriatric group. The need for transfusion was also significantly higher in the geriatric population than that in the younger population.

This study evaluated 412 patients with upper gastrointestinal bleeding and compared clinical, laboratory, and endoscopic differences between geriatric (≥65 years) and young (<65 years) patients. The large sample size and multidimensional analysis of the data based on age groups are among its key strengths. This study highlights that peptic ulcer is the most common cause of bleeding in both age groups and that age-related comorbidities play a critical role in the management of bleeding. However, the retrospective design and lack of data on H. pylori infection are notable limitations.

Conclusion

In conclusion, GI bleeding remains a significant cause of mortality and morbidity in all age groups. The causes of upper GI bleeding were similar in both geriatric and young populations. While hospital stays were longer and erythrocyte transfusion needs were higher in the geriatric group, mortality rates were similar between the two groups.

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