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Upper gastrointestinal bleeding in octogenarians: a prospective comparative study on clinical, endoscopic findings and outcomes with younger patients

Muhammed Bahaddin Durak[1], Cem Şimşek[2], Yavuz Çağır[1], İlhami Yüksel[1,3]

[1]Department of Gastroenterology, Ankara Bilkent City Hospital, Ankara, Turkey
[2]Department of Gastroenterology, Mehmet Akif İnan Training and Research Hospital, University of Health Sciences, Şanlıurfa, Turkey
[3]Division of Gastroenterology, Department of Internal Medicine, Faculty of Medicine, Ankara Yıldırım Beyazıt University, Ankara, Turkey

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ABSTRACT

Aims: Acute upper gastrointestinal bleeding (UGIB) is a critical medical emergency that becomes more prevalent with advancing age. This study aimed to compare clinical and endoscopic features, as well as clinical outcomes, between patients below 80 years of age and octogenarians (≥80 years of age) presenting with UGIB.

Methods: Data related to past medical history, physical examination, laboratory, and endoscopic findings were collected prospectively. The clinical outcomes evaluated in both octogenarian and younger groups included: (1) necessity for endoscopic intervention; (2) transfusion requirement; (3) hospital stay duration; (4) rebleeding events; and (5) 30-day mortality rate.

Results: The study revealed that comorbidities such as cardiovascular diseases, chronic renal failure, and hypertension were statistically more prevalent in octogenarians. Furthermore, octogenarians had lower serum albumin and hemoglobin levels, and higher INR and BUN levels. High-risk categorization according to risk scoring systems was significantly more prevalent among octogenarians. Upon evaluating clinical outcomes, octogenarians demonstrated a longer hospital stay, higher transfusion needs, and a higher 30-day mortality rate. Peptic ulcer was identified as the most common cause of bleeding in both groups, but gastric ulcers were statistically more common in octogenarians.

Conclusion: The severity of UGIB is notably increased in octogenarians than younger because of more comorbid disease, lower serum albumin hemoglobin levels, and higher INR BUN and also High-risk scoring systems. Gastric ulcers were statistically more common in octogenarians.

Keywords: Nonvariceal upper gastrointestinal bleeding, octogenarian, rebleeding, 30-day mortality.

INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB) represents a significant emergency, with life-threatening implications that disproportionately affect elderly populations.[1-3] In these individuals, UGIB results in extended hospital stays and presents higher morbidity and mortality rates compared to their younger counterparts, despite advancements in endoscopic hemostasis and diagnostic and therapeutic modalities.[4,5]

The relationship between advancing age and escalating mortality rates in UGIB cases has been consistently observed. However, discrepancies in the definition of 'elderly' across various studies have led to variable reported mortality rates associated with acute UGIB, reaching upwards of 44% in certain studies.[3,6-8] Compared to younger demographics, the elderly population experiences a notably higher incidence of UGIB[5,9] with mortality rates spanning from 12 to 25% for individuals aged over 60 and falling below 10% for those under 60.[10]

Factors such as the patient's demographic characteristics, the etiology of the bleeding, and the timeliness of treatment substantially influence the mortality and morbidity outcomes associated with UGIB. It is reported that 35-45% of UGIB presentations involve individuals aged over 60.[11,12] This population is more susceptible to UGIB complications, likely due to a higher prevalence of comorbid conditions and the common use of nonsteroidal anti-inflammatory drugs (NSAIDs) or antiplatelets.[13]

Corresponding Author: Muhammed Bahaddin Durak, doctormbd@gmail.com

Several studies have compared the presentation of acute UGIB in elderly populations to younger ones, albeit with inconsistent age classifications for the elderly group.[4,6,7,11] Our study aims to address this inconsistency by examining individuals aged under 80 and octogenarians (those aged 80 or above). The comparison will focus on their clinical and endoscopic profiles as well as clinical outcomes in the context of UGIB.

METHODS

The study was carried out with the permission of Ankara City Hospital Scientific Researches Ethics Committee (Date: 05.10.2022, Decision No: E1/22/2951). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Population

This investigation included participants aged 18 years and above who were diagnosed with non-variceal upper gastrointestinal bleeding (NVUGIB) from February 2019 to February 2020. All NVUGIB diagnoses were confirmed via endoscopy. Patients over the age of 80 were classified as octagenerian, and those between the ages of 18-80 were classified as younger. Exclusions encompassed patients with variceal bleeding and those unable or unwilling to undergo endoscopy due to unfavorable clinical conditions.

Patient Management

Upon arrival at the emergency room, NVUGIB patients were assessed by a gastroenterologist. Initial diagnoses were based on symptoms such as hematemesis, melena, or the presence of blood in nasogastric aspirate. Treatment with pantoprazole (8 mg/h following an 80 mg bolus) was initiated immediately for all NVUGIB patients. Erythrocyte suspension (ES) transfusions were administered to those with hemoglobin levels under 9.0 g/dl.

Endoscopy was performed within the first 12 hours for patients presenting with unstable hemodynamic conditions, signs of ongoing bleeding, or reduced hematocrit despite transfusion. Patients deemed clinically stable and showing no signs of severe bleeding underwent endoscopy within the first 24 or 48 hours. The timing of endoscopy was determined relative to the patient's arrival at the emergency department. If endoscopic treatment proved unsuccessful, patients were referred to interventional radiology or surgery. The decision to admit or discharge a patient was based on initial evaluations, clinical status, and endoscopic findings. All patients were monitored for 30 days.

Clinical Outcomes

Clinical outcomes under evaluation included: (1) necessity for endoscopic intervention; (2) need for transfusion; (3) duration of hospital stay; (4) rebleeding occurrences; and (5) 30-day mortality. Endoscopic treatment could involve mechanical (hemoclips), heater therapy, or adrenaline injections. However, adrenaline injection alone was not deemed as endoscopic treatment. Besides bleeding symptoms, a hemoglobin drops of more than 2.0 g/dl indicated rebleeding. Rebleeding was confirmed via a second-look endoscopy (also termed as active bleeding or SRH). Mortality was any death occurring within 30 days of bleeding.

Data Collection

Prospective data collected encompassed evidence of bleeding (including hematemesis, melena, and syncope), prior medical conditions, physical examination results, and laboratory and endoscopic findings. Upon identification of high-risk stigmata of recent hemorrhage (SRH), such as fresh bleeding (spurting/oozing) or non-bleeding visible vessels, endoscopic therapy was initiated. Endoscopic data, including the type of procedures employed, the bleeding source, ulcer presence, its location, number, size, and Forrest classification were recorded. Hospitalization details, blood transfusions, endoscopic interventions, length of hospital stay, rebleeding instances, and 30-day mortality were logged using the hospital's computerized civil medical registration system. At the time of admission, the Glasgow Blatchford Score (GBS), Clinical Rockall Score (CCRS), and AIMS65 score were calculated by gastroenterologists. The Complete Rockall Score (CRS) was computed post-endoscopy. Patients not requiring hospitalization were re-evaluated at the 1st and 4th week follow-ups.

Statistics

The Kolmogorov-Smirnov test assessed the normality of the continuous variables' distribution. Normally distributed continuous variables were expressed as mean ± standard deviation (SD), compared via the student's t-test. Non-normally distributed continuous variables were conveyed as median (interquartile range [IQR]), and compared using the Mann-Whitney U test. Categorical variables were reported as frequency (percentage) and compared through the Chi-Square test or Fisher's Exact test, as deemed appropriate. IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, N.Y., USA) was employed for statistical analyses. A p-value <0.05 was considered statistically significant.

RESULTS

Patient Characteristics

The study encompassed 467 patients with a median age of 67 (ranging from 46-89) years. Of these, 106 patients (22.7%) were octogenarians and 361 (77.3%) patients were in the under 80 age group. Within the octogenarian group, 58 (54.7%) were male, compared to 256 (70.9%) male patients in the under 80 age group. This difference between the groups was statistically significant (p=0.002). On comparing comorbidities, cardiovascular diseases, chronic renal failure, and hypertension were significantly more prevalent in the octogenarian group (p0.001 for all parameters). Use of proton pump inhibitors (PPI), acetylsalicylic acid (ASA), and Novel oral anticoagulant drugs (NOAC) were significantly higher in octogenarians (p=0.026, p=0.011, and p<0.001, respectively). However, the usage of nonsteroidal anti-inflammatory drugs (NSAID) was significantly higher in the under 80 age group (p=0.040) (Table 1).

Table 1. Patient characteristics, clinical and laboratory data of the study group and subgroups by age[x]

	Study group (n=467)	Aged <80 years (n=361)	Aged ≥80 years (n=106)	P
Age, years	67 (46-89)	61 (46-78)	86 (82-89)	**<0.001**
Gender, male, n (%)	314 (67.2)	256 (70.9)	58 (54.7)	**0.002**
Presenting symptoms, n (%)				
Hematemesis	238 (51)	178 (49.3)	60 (56.6)	0.186
Melena	318 (68.1)	248 (68.7)	70 (66)	0.605
Hematochezia	39 (8.4)	32 (8.9)	7 (6.6)	0.460
Hematemesis/Melena	427 (91.4)	329 (91.1)	98 (92.5)	0.670
Comorbidities, n (%)				
Cardiovascular diseases (AF, CAD, CHF)	200 (42.8)	133 (36.8)	67 (63.2)	**<0.001**
CVD	39 (8.4)	26 (7.2)	13 (12.3)	0.098
CRF	51 (10.9)	28 (7.8)	23 (21.7)	**<0.001**
HT	208 (44.5)	141 (39.1)	67 (63.2)	**<0.001**
CLD	10 (2.1)	7 (1.9)	3 (2.8)	0.577
DM	99 (21.2)	77 (21.3)	22 (20.8)	0.899
PPI usage, n (%)	112 (24)	78 (21.6)	34 (32.1)	**0.026**
Previous episode of UGIB, n (%)	100 (21.4)	83 (23)	17 (16)	0.125
Previous GIS surgery, n (%)	16 (3.4)	15 (4.2)	1 (0.9)	0.136
Medication, n (%)				
NSAIDs	74 (15.8)	64 (17.7)	10 (9.4)	**0.040**
Antithrombotic Agents				
Aspirin	123 (26.3)	85 (23.5)	38 (35.8)	**0.011**
DAPT	13 (2.8)	11 (3)	2 (1.9)	0.742
Anticoagulants				
Warfarin	41 (8.8)	34 (9.4)	7 (6.6)	0.368
NOAC	31 (6.6)	12 (3.3)	19 (17.9)	**<0.001**
Pulse, > 100 beats/min, n (%)	198 (42.4)	145 (40.2)	53 (50)	0.072
Systolic blood pressure, < 90 mmHg, n (%)	34 (7.3)	30 (8.3)	4 (3.8)	0.114
Hemoglobin level on admission (g/dl)	9.91 ± 2.92	10.08 ± 2.92	9.33 ± 2.84	**0.019**
BUN level on admission (mg/dl)	33.13 (21.93-52.73)	29.87 (20.07-43.87)	49 (29.87-74.09)	**<0.001**
INR on admission	1.13 (1.05-1.27)	1.11 (1.04-1.24)	1.2 (1.09-1.34)	**<0.001**
Serum albumin level on admission (g/L)	36 (32-40)	37 (32-41)	34 (31-37)	**<0.001**
Serum platelet level on admission (10^9/L)	254 (201-333)	250 (202.5-329.5)	273 (198-355.25)	0.258
Endoscopy time, n (%)				0.073
<12 hours	329 (70.4)	260 (72)	69 (65.1)	
12-24 hours	94 (20.1)	73 (20.2)	21 (19.8)	
24-48 hours	44 (9.4)	28 (7.8)	16 (15.1)	
GBS ≤ 1*	26 (5.6)	25 (6.9)	1 (0.9)	**0.018**
GBS ≥ 7**	336 (71.9)	248 (68.7)	88 (83)	**0.004**
AIMS65 score = 0*	181 (38.8)	181 (50.1)	-	**<0.001**
AIMS65 score ≥ 2**	135 (28.9)	81 (22.4)	54 (50.9)	**<0.001**
CCRS = 0*	83 (17.8)	83 (23)	-	**<0.001**
CCRS ≥ 3**	290 (62.1)	197 (54.6)	93 (87.7)	**<0.001**
CRS ≤ 2*	83 (17.8)	83 (23)	-	**<0.001**
CRS ≥ 8**	49 (10.5)	33 (9.1)	16 (15.1)	0.079

x Results are expressed as: mean ± standard deviation, median (interquartile range), or frequency (%).
*: Patients classified as low risk
**: Patients classified as high risk
Significant P values are in bold.
AF: Atrial fibrillation, CAD: Coronary artery disease, CHF: Congestive heart failure, CVD: Cerebrovascular disease, CRF: Chronic renal failure, HT: Hypertension, CLD: Chronic liver disease, DM: Diabetes mellitus, PPI: Proton Pump Inhibitors, UGIB: Upper gastrointestinal bleeding, GIS: Gastrointestinal system, NSAIDs: Non-steroidal anti-inflammatory drugs, DAPT: Dual antiplatelet therapy, NOAC: Novel oral anticoagulant drugs, BUN: Blood urea nitrogen, INR: International normalized ratio, GBS: Glasgow-Blatchford score, CCRS: Clinical Rockall score, CRS: Complete Rockall score,

Initial Presentation

At admission, octogenarians had significantly higher blood urea nitrogen (BUN) and international normalized ratio (INR) levels (p0.001 for both). On the other hand, the under 80 age group had significantly higher hemoglobin and serum albumin levels (p=0.019 and p0.001, respectively). Moreover, they were significantly more likely to have low-risk Glasgow Blatchford Score (GBS) ≤1, AIMS65 score =0, Clinical Rockall Score (CCRS) =0, and Complete Rockall Score (CRS) ≤2 (p=0.018, p0.001, p0.001, and p0.001, respectively). In contrast, octogenarians had significantly higher numbers of patients with high-risk GBS ≥7, AIMS65 score ≥2, and CCRS ≥3 (p=0.004, p0.001, and p0.001, respectively). The remaining investigated factors showed no significant difference (p>0.05 for all parameters) (Table 2).

Endoscopic Findings Clinical Outcomes

Peptic ulcers were the most common cause of UGIB across the entire study group and the age-based subgroups, with the majority being duodenal and single ulcers. Most ulcers were less than 10 mm in size. Subgroup analyses revealed that the octogenarians had significantly more gastric ulcers, whereas the under 80 age group had significantly more esophageal ulcers (p=0.031 and p=0.043, respectively) (Table 3).

Octogenarians had a statistically significantly longer hospital stay (5 (0-12) days) than the under 80 age group (4 (0-8) days; p=0.025). They also had a significantly higher need for transfusion and 30-day mortality rate (p=0.001 and p=0.006, respectively). The other parameters examined did not reveal any statistically significant difference (p>0.05 for all parameters).

Table 2. Results and comparisons of clinical outcomes[x]

	Study group (n=467)	Aged <80 years (n=361)	Aged ≥80 years (n=106)	P
Discharged within 24 hours, n (%)	132 (28.3)	105 (29.1)	27 (25.5)	0.468
Hospitalization, n (%)	335 (71.7)	256 (70.9)	79 (74.5)	0.468
Length of hospital stay, days	4 (0-8)	4 (0-8)	5 (0-12)	**0.025**
Need for endoscopic intervention, n (%)	136 (29.1)	106 (29.4)	30 (28.3)	0.833
Need for surgical/radiological intervention, n (%)	8 (1.7)	5 (1.4)	3 (2.8)	0.389
Need for transfusion, n (%)	254 (54.4)	182 (50.4)	72 (67.9)	**0.001**
Rebleeding (during hospital stay), n (%)	36 (7.7)	26 (7.2)	10 (9.4)	0.449
30-day mortality, n (%)	50 (10.7)	31 (8.6)	19 (17.9)	**0.006**

x Results are expressed as: median (interquartile range), or frequency (%). Significant P values are in bold.

Table 3. Comparisons of endoscopic findings[x]

	Study group (n=467)	Aged <80 years (n=361)	Aged ≥80 years (n=106)	P
Peptic ulcer, n (%)	235 (50.3)	180 (49.9)	55 (51.9)	0.714
Gastric ulcer, n (%)	78 (16.7)	53 (14.7)	25 (23.6)	**0.031**
Duodenal ulcer, n (%)	157 (33.6)	127 (35.2)	30 (28.3)	0.188
Number of ulcers, n (%)				
Single	238 (51)	186 (51.5)	52 (49.1)	0.655
Multiple	48 (10.3)	36 (10)	12 (11.3)	0.688
Size of ulcer, n (%)				
<10 mm	159 (34)	126 (34.9)	33 (31.1)	0.471
10-20 mm	87 (18.6)	67 (18.6)	20 (18.9)	0.943
>20 mm	41 (8.8)	30 (8.3)	11 (10.4)	0.508
Forrest classification of UGIB, n (%)				
Ia, Ib, IIa, IIb	105 (22.5)	81 (22.4)	24 (22.6)	0.965
IIc, III	180 (38.5)	141 (39.1)	39 (36.8)	0.673
Erosive esophagitis, n (%)	17 (3.6)	11 (3)	6 (5.7)	0.237
Esophageal ulcer, n (%)	28 (6)	26 (7.2)	2 (1.9)	**0.043**
Upper GIS malignancy, n (%)	42 (9)	34 (9.4)	8 (7.5)	0.554
Erosive/hemorrhagic gastropathy/duodenopathy, n (%)	73 (15.6)	53 (14.7)	20 (18.9)	0.297
Angioectasia, n (%)	17 (3.6)	11 (3)	6 (5.7)	0.237
Dieulafoy lesion, n (%)	5 (1.1)	4 (1.1)	1 (0.9)	1
Cameroon lesion, n (%)	5 (1.1)	4 (1.1)	1 (0.9)	1
Lesion not visualized, n (%)	20 (4.3)	16 (4.4)	4 (3.8)	1

x Results are expressed as: frequency (%). Significant P values are in bold. UGIB: Upper gastrointestinal bleeding, GIS: Gastrointestinal system

DISCUSSION

The mortality rate is persistently increasing among the elderly, despite significant advances in the diagnosis and management of upper gastrointestinal bleeding (UGIB). This could be attributed to heightened vulnerability, diminished ability in the elderly to withstand hemodynamic changes during acute bleeding episodes, presence of underlying co-morbidities, and concurrent use of multiple medications.[5,10,13,14]

Previous research conducted by Laine et al.[2] in the US identified that the incidence of UGIB was 31.7 per 100,000 in the patient group under 65 years of age, and significantly higher at 425.2 per 100,000 in the population over 75 years 2. In the USA, the incidence of UGIB was found to be 31.7/100.00 in the patient group under 65 years of age, while this rate was found to be 425.2/100.000 in the population over 75 years of age. UGIB, the incidence and mortality of which increase with aging, poses a concern and challenge for healthcare providers. Key strategies for reducing poor clinical outcomes in the elderly presenting with UGIB include close monitoring, risk stratification, and effective endoscopic and medical treatment. Another important distinction between older and younger patients presenting with UGIB is the cause of bleeding. Peptic ulcers, malignancies, and variceal bleeding are more prevalent in elderly patients.[13,15]

Our study revealed that cardiovascular diseases, chronic renal failure, and hypertension were more common among octogenarians, as were ASA and NOAC use. In contrast, NSAID use was higher in the under-80 group. Laboratory findings showed lower serum albumin and hemoglobin levels, but higher INR and BUN levels in octogenarians. These patients were also more frequently identified as high-risk by risk scoring systems. Poor clinical outcomes such as longer hospital stays, increased need for transfusion, and higher 30-day mortality were more prevalent among octogenarians. Peptic ulcer was the leading cause of bleeding in both groups, though gastric ulcers were more common in octogenarians and esophageal ulcers were more common in the younger population.

Contradictory results are evident in previous studies regarding acute upper GI hemorrhage mortality between elderly and younger individuals.[3,7,8,10] For instance, Elsabaey and colleagues 1 reported a rebleeding rate of 6.4% and an in-hospital mortality rate of 4.8% in NVUGIB patients over 60 years, with a median age of 68.5. Our study, however, noted a rebleeding rate of 9.4% and a 30-day mortality rate of 17.9% in octogenarians. The higher rebleeding and mortality rates could be attributed to the older age of our patient population and our 30-day evaluation of mortality. In fact, Emektar et al.[16] study on 30-day mortality in patients over 65 years of age reported a 14.1% mortality rate.

In their study on upper gastrointestinal tract bleeding in patients over 85 years of age, Koziel et al.[17] found the rebleeding rate to be 11.9% and the mortality rate as high as 20.24%. Similar studies conducted in elderly patients also supported these data.[18,19] The increase in comorbid diseases with aging, Use of NSAIDs, antiplatelet agents and anticoagulants were common risk factors. Increased oxidative stress with aging, mitochondrial dysfunction, impaired resistance to molecular stressors, and endothelial dysfunction due to chronic low-grade inflammation may explain the severity of bleeding in older patients.[20,21]

Developing a geriatric assessment methodology for elderly patients presenting with NVUGIB could be beneficial, given the increase in comorbidities with age, multiple drug use, and various age-related disorders which contribute to morbidity and mortality.[9,22,23]

Risk scoring systems like GBS, CCRS, CRS, and AIMS65 scores are advised for patients presenting with NVUGIB 24-28. Although no optimal scoring system specific to the elderly has been designed yet, our study found that octogenarians were more frequently identified as high-risk according to current scoring systems: 83% of octogenarians had GBS ≥7, 50.9% had AIMS65 score ≥2 and 87.7% had CCRS ≥3. In contrast, low-risk patients were more prevalent in the under-80 group.

The most common cause of acute UGIB in older adults is peptic ulcer disease.[11,29,30] Similarly in our study, peptic ulcer was the most common cause in both groups. However, gastric ulcer was more common in octogenarians. The explanation for this may be the high use of ASA and NOAC in the octogenarian group and the higher rate of concomitant chronicle kidney disease. Both conditions increase the incidence of gastric ulcers.[31-33] In our study, the incidence of esophageal ulcer was lower in octogenarians and we could not explain the reason for this, which may be explained by the relatively low number of patients with esophageal ulcer.

Limitations of our study include its single-center design and a possible bias towards higher acceptance of high-risk patients, which could have influenced our results. Also, we could not detect *Helicobacter pylori* (HP) status in all patients. Although the incidence of drug-related bleeding increases with advancing age, HP-associated peptic ulcer remains important.[31,34] The strengths of the study include its prospective and comparative design, performance of endoscopy on all patients, and data collection by gastroenterologists.

CONCLUSION

The clinical outcomes of NVUGIB are significantly poorer in the elderly population because of more common comorbid disease, lower serum albumin, hemoglobin levels, and higher INR, BUN and also High-risk scoring systems. Gastric ulcers were statistically more common in octogenarians. It is crucial, therefore, to develop an optimal assessment and management methodology specifically for these patients, which could help improve their clinical outcomes and overall prognosis.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara City Hospital Scientific Researches Ethics Committee (Date: 05.10.2022, Decision No: E1/22/2951).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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