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Retrospective analysis of patients with upper gastrointestinal hemorrhage

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ABSTRACT

Aims: Upper gastrointestinal bleeding (UGIB) is gastrointestinal bleeding that occurs in the upper gastrointestinal tract and is usually defined as bleeding originating from the esophagus, stomach or duodenum. In this study, we aimed to analyse the demographic and clinical characteristics of UGIB patients.

Methods: This retrospective study included patients presenting with UGIB to our gastroenterology clinic between 2006 and 2012. Epidemiological characteristics, risk factors and the presence of *Helicobacter pylori* (*H. pylori*) were investigated.

Results: The study included 282 patients. 200 of the patients were male and the mean age was 56 years. 47.2% of the patients presented with melena. 63.9% of the patients had one or more systemic diseases. The highest frequency of bleeding presentations occurred in May and June. The most common cause of bleeding was duodenal ulcer in 38.6%. According to Forrest classification, 73.8% of the patients had Forrest 3 ulcer. *H. pylori* was positive in 66.2% of the patients. Esophageal varices and fundal varices were observed in 7.3% and 1.8% of the patients, respectively. 224 (79.4%) patients received blood replacement. There was a significant difference between erythrocyte suspension replacement in patients with a history of acetylsalicylic acid use (p=0.03) and erythrocyte suspension (p=0.01) and fresh frozen plasma (p<0.001) replacement in patients with a history of warfarin use.

Conclusion: This study reveals that many variables such as age, comorbidity, medication use and *H. pylori* infection should be taken into consideration in the clinical management of UGIB.

Keywords: Seasonal variability, peptic ulcer, upper gastrointestinal bleeding

INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB) is bleeding from any localisation in the gastrointestinal tract between the proximal part of the esophagus and the ligament of Treitz in the second part of the duodenum.[1] The annual incidence of UGIB is 84 to 100 per 100.000. Many causes, including peptic ulcer disease, esophageal and gastric varices, and malignancies, are involved in the aetiology.[2]

Although the availability of proton pump inhibitors (PPIs), advances in *Helicobacter pylori* (*H. pylori*) eradication therapy, and rapid access to endoscopy have led to a decrease in the incidence rate of UGIB, the mortality rate is still 5-10%.[3] Other factors associated with mortality include recurrent bleeding, presence of comorbidities, history of peptic ulcer or previous surgical intervention, presentation with hematemesis, development of hypotension and esophageal variceal bleeding.[4]

UGIBs are observed twice more frequently in men than in women. The incidence increases with age.[5] Various studies have been conducted to evaluate the effect of seasonal changes on UGIB, but different results have been obtained with different study populations and regions.[6]

Retrospective analysis of UGIB patients provides important information about patient demographics, clinical presentation, management strategies and outcomes. A retrospective study identified several causes of acute non-variceal UGIB and emphasised the importance of understanding its epidemiology for effective management.[7]

This retrospective study aimed to investigate whether the presentation patterns of upper gastrointestinal hemorrhage (UGIH) exhibit seasonal variation, and whether key clinical parameters—such as comorbidities, medication use, and endoscopic findings—differ across seasons.

METHODS

This study was conducted in accordance with the Declaration of Helsinki. The Karadeniz Technical University Clinical

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Researches Ethics Committee granted approval for this study (Date: 24.01.2013, Decision No: 2012/147).

Patients presenting to the emergency department of Karadeniz Technical University Hospital with hematemesis, melena, hematochezia, or other symptoms of UGIB complaints between January 2006 and December 2012 were included in this study.

As a result of the evaluation, esophagogastroduodenoscopy was performed within the first 24 hours in the appropriate patients with UGIB hemorrhage. Endoscopy was performed as soon as haemodynamic stability was achieved in unstable patients. All endoscopic procedures were performed by the same experienced gastroenterologist at our center.

In order to determine the factors affecting morbidity and mortality in patients, age, gender, complaint at presentation, presence of systemic disease, medications (Non-steroidal antiinflammatory drugs (NSAIDs), acetylsalicylic acid (ASA), warfarin and other drugs), serum haemoglobin (g/dl), haematocrit (%), number of transfusions and blood products given, blood group, presence of *H. pylori* and control endoscopies were examined both at presentation and at discharge. Patients with peptic ulcer hemorrhage were grouped according to Forrest classification. Other endoscopic lesions were recorded.

The primary outcome was to identify the most frequent causes and risk factors of UGIB in a tertiary hospital population. Secondary outcomes included seasonal distribution, transfusion requirements, and association with medication use.

Patients with incomplete endoscopic or clinical data, patients under 18 years of age, or those with active lower gastrointestinal bleeding were excluded from the study. Also, patients who did not have an esophagogastroduodenoscopy those with bleeding from injuries, people with blood cancers or bleeding disorders, and those who passed away before they could be diagnosed were left out to keep the diagnosis clear and the analysis consistent.

Statistical Analysis

The data analysis was performed using IBM SPSS statistics version 25 (IBM corp.). Kolmogorov-Smirnov normality tests were used to evaluate the distribution of variables and an independent Sample-t test was used for comparison of two group means. A Chi-square test was used to assess the relationships between the nominal variables. Data were presented as means±standard deviation or number and percentage according to their type and distribution. Differences were considered significant at $p<0.05$.

RESULTS

Of the 282 patients diagnosed with UGIB, 200 (70.9%) were male. The mean age was 56.66±19.44 years, the oldest patient was 96, the youngest was 18, and the median age was 59 years. The mean age of men was 59.8±17.5 years, while the mean age of women was 72.9±13.9 years.

Of the patients included in the study, 67 (23.8%) presented with hematemesis, 133 (47.2%) with melena, and 82 (29.1%) with hematemesis+melena. All patients were hospitalized in the clinic. During hospitalization, three patients developed recurrent gastrointestinal bleeding.

One or more comorbid systemic diseases were present in 180 (63.9%) of the cases. The most common comorbid diseases were hypertension (HT) in 113 (40%) patients, coronary artery disease (CAD) in 67 (23.7%) patients, diabetes mellitus (DM) in 49 (17.3%) patients, and chronic kidney disease (CKD) in 24 (8.5%) patients.

A history of medication use was present in 180 (63.8%) of the patients included in the study. While 98 (34.8%) patients were using ASA, 78 (27.7%) patients were using NSAIDs, 30 (10.6%) patients were using warfarin, 7 (2.5%) patients were using steroids and 6 (2.1%) patients were using clopidogrel.

When the presentation seasons of the patients were examined, 52 (10.4 %) patients presented in winter, 83 (29.4 %) in spring, 83 (29.4 %) in summer, and 64 (22.7 %) in autumn. When the admissions of the patients were analysed on the basis of months, it was found that the highest number of admissions was in May and June with 35 patients (12.4%) and the lowest number of admissions was in January with 14 patients (4.9%). To evaluate the potential influence of seasonal variation on clinical and demographic parameters among patients presenting with UGIB, a one-way ANOVA test was conducted across four seasons: winter, spring, summer, and autumn. Among the analyzed variables—including age, admission hemoglobin levels, comorbidities such as DM, congestive heart failure (CHF), and CKD—no statistically significant differences were observed across seasons ($p>0.05$ for all). This suggests that the seasonal distribution does not significantly affect these key clinical predictors in our patient cohort.

The most common causes of bleeding found by esophagogastroduodenoscopy were duodenal ulcer 124 (38.6 %), gastric ulcer 73 (24.7 %), erosion 58 (18.7 %), esophageal varices 27 (7.3 %), gastritis 19 (5.1 %). When the diagnoses obtained as a result of endoscopy were compared in male and female patients, no significant statistical result was found (**Table 1**).

Table 1. Endoscopic diagnoses by gender

Diagnosis	Female (n, %)	Male (n, %)	p-value
Gastric ulcer	26 (35.6%)	47 (64.4%)	0.15
Duodenal ulcer	35 (28.2%)	89 (71.8%)	0.78
Esophageal varices	12 (44.4%)	15 (55.6%)	0.1
Fundal varices	3 (37.5%)	5 (62.5%)	0.69
Oesophagitis	1 (7.7%)	12 (92.3%)	0.11
Gastritis	6 (31.6%)	13 (68.4%)	1.0
Erosion	22 (37.9%)	36 (62.1%)	0.13
Angiodysplasia	0 (0%)	7 (100%)	0.11
Cancer	1 (25%)	3 (75%)	1.0
Other	6 (37.5%)	10 (62.5%)	0.61

Forrest classification of the patients diagnosed with peptic ulcer was as follows: 3 (1.6 %) patients Forrest 1a, 11 (6.1 %) patients Forrest 1b, 19 (10.5 %) patients Forrest 2a, 10 (5.5%) patients Forrest 2b, 4 (2.2 %) patients Forrest 2c and 133

(73.8%) patients Forrest 3. When ulcer location and size were analysed in patients with peptic ulcer, ulcers were found in the antrum in 39 patients, in the corpus in 41 patients and in the bulb in 120 patients. Their sizes were 0.90±0.84 mm, 1.25±1.02 mm and 1.02±0.92 mm, respectively. When the relationship between peptic ulcer and *H. pylori* was analysed, *H. pylori* was positive in 66.2%.

Blood groups of 250 patients were analysed. The distribution of blood groups in the patients whose blood groups were analysed was as follows: 112 (44.8%) patients had A Rh (+), 82 (32.8%) patients had 0 Rh (+), 24 (9.6%) patients had B Rh (+), 14 (5.6%) patients had AB Rh (+), 18 (7.2%) patients had Rh (-) blood group.

The mean admission haemoglobin level was 8.95 g/dl (female: 8.61 g/dl, male: 9.32 g/dl) and the mean discharge haemoglobin level was 10.73 g/dl (female: 11.6 g/dl, male: 10.3 g/dl).

224 (79.4%) patients received blood replacement. 137 (61.1%) patients received erythrocyte suspension only, 19 (8.4%) patients received fresh frozen plasma (FFP) only, 3 (1.3%) patients received platelet suspension only, 58 (25.8%) patients received erythrocyte suspension+FFP, and 7 (3.1%) patients received erythrocyte suspension+platelet suspension+FFP. The relationship between the number of erythrocyte suspensions, platelet suspensions and FFP replacements and the drugs used by the patients was analysed. A significant difference was found between erythrocyte suspension replacement (p=0.03) in patients with a history of ASA use, and between erythrocyte suspension (p=0.01) and FFP (p<0.001) replacement in patients with a history of warfarin use (**Table 2**).

Table 2. Relationship between medication use and blood product replacement

Drug	Erythrocyte suspension (Mean±SD)	p-value (erythrocyte suspension)	FFP (mean±SD)	p-value (FFP)
ASA	3.18±3.40	0.03	1.44±4.11	0.24
NSAIDs	2.22±2.40	0.21	1.06±2.98	0.12
Steroids	3.00±1.63	0.3	1.29±2.62	0.89
Warfarin	4.97±7.37	0.01	3.60±5.71	<0.001
Clopidogrel	2.00±2.09	0.71	0	-

SD: Standard deviation, ASA: Acetylsalicylic acid, FFP: Fresh frozen plasma, NSAIDs: Non-steroidal antiinflammatory drugs

Follow-up endoscopy was performed in 66 (23%) of the patients included in the study. Improvement was noted in 49 of the control endoscopies.

Scoring systems such as Rockall and Blatchford were applied to evaluate the clinical severity and risk stratification in patients presenting with UGIB. The Rockall score, which considers age, hemodynamic status, comorbidities, diagnosis, and endoscopic stigmata of hemorrhage, was calculated for all patients. Scores ranged from 0 to 10, with the majority of patients falling into the 5–7 category, indicating moderate to high risk of adverse outcomes (**Table 3**). The Blatchford score is designed to identify patients who require clinical intervention prior to endoscopy. In our cohort, scores ranged from 0 to 10, with the majority of patients scoring between 7 and 10 (**Table 4**). This suggests that most patients had significant clinical findings warranting hospitalization and potential therapeutic procedures.

Table 3. Distribution of patients by Rockall score range

Score range	Patients (n)
0-2	55
3-4	76
5-7	127
8+	24

Table 4. Distribution of patients by Blatchford score range

Score range	Patients (n)
0-3	2
4-6	100
7-10	180
11+	0

To assess whether Rockall and Blatchford scores varied significantly according to seasonal presentation, a one-way ANOVA was conducted. The patients were categorized into four groups based on the season of presentation: spring, summer, autumn, and winter. The analysis showed no statistically significant difference in Rockall and Blatchford scores among different seasons (respectively p=0.47, p>0.5). This suggests that the severity of UGIB as measured by the Rockall score is not influenced by seasonal factors in this cohort.

DISCUSSION

Acute UGIB is a common condition worldwide, frequently leading to hospitalisation and has significant associated morbidity and mortality, especially in the elderly.[8]

The European Society of Gastrointestinal Endoscopy (ESGE) recommends that the initial evaluation of patients presenting with acute UGIB should include history of comorbidities and medications contributing to bleeding, haemodynamic parameters, physical examination (including digital rectal examination) and laboratory markers.[9]

In our study, the majority of patients diagnosed with UGIB were male. These findings are consistent with the studies in the literature which reported that UGIB was observed 2 times more frequently in males than females.[3,10] In addition, a positive correlation between age and incidence of hemorrhage has been shown in previous publications.[10] It is known that the risk of bleeding and its consequences are more severe especially in patients aged 60 years and older. These findings suggest that closer monitoring of patients in the advanced age group is important in clinical management.[8]

In our study, 64% of the patients had one or more comorbid diseases. It has been shown in previous studies that the presence of comorbid diseases both increases the risk of bleeding and adversely affects the prognosis of bleeding.[4,8]

The presence of comorbid diseases may affect the timing and success of endoscopic interventions by disrupting haemodynamic stability.[9]

Duodenal ulcer was found to be the most common cause of bleeding. This rate is similar to the large patient series in the literature.[2,11,12] According to the Forrest classification, the majority of the patients were classified as Forrest 3, suggesting that late presentations without active bleeding findings were high. In addition, the rate of *H. pylori* positivity was as high as 66.2% and this supports that *H. pylori* is still an important etiological factor in ulcer pathogenesis. Despite the widespread use of PPIs and advances in *H. pylori* eradication, *H. pylori* is still an important risk factor.[3] Therefore, *H. pylori* screening and eradication treatment can be routinely applied as a preventive strategy in individuals with a history of bleeding.

In our study, it was found that the majority of patients used NSAIDs, ASA, warfarin or other antithrombotic agents. This reveals the adverse effects of antithrombotic agents on UGIB and the difficulties in clinical management. As stated in the literature, the risk of GIB is significantly increased in patients receiving antithrombotic treatment, resulting in increased hospitalisation time and treatment costs.[13,14] Therefore, evaluation of prophylaxis with PPI is recommended as an important preventive strategy to reduce the incidence of UGIB, especially in individuals with advanced age, comorbid diseases and under antithrombotic treatment.

Our study revealed that presentations of UGIB showed a seasonal distribution. The most common presentation seasons were spring and summer, especially in May and June. Shiekh et al.[15] conducted a study similar to ours. In a large-scale study conducted by Yoon et al.[6] in a Korean population, it was reported that peptic ulcer disease and related gastrointestinal bleeding showed a significant increase in spring and winter. Similarly, Lenzen et al.[3] revealed that gastrointestinal bleeding cases were significantly associated with gender, age and seasonal circadian factors in studies conducted in Europe. Although the exact causes of seasonal variability have not yet been fully elucidated, it is thought that environmental and behavioural factors such as seasonal differences in dietary habits, changes in the frequency of gastrointestinal infections, seasonal fluctuations in medication use habits (for example, periods when painkillers are used more) may affect this situation. Additionally, emerging evidence indicates that seasonal shifts in gut microbiota composition, driven by dietary changes, may further modulate the gastrointestinal mucosal barrier and susceptibility to bleeding.[16]

Limitations

This research possesses multiple limitations. The retrospective design may result in selection and information biases. Secondly, the data originates from a single center, potentially constraining generalizability. Thirdly, certain potential confounders, including alcohol use, smoking status, and adherence to PPI prophylaxis, were unavailable.

By simultaneously evaluating demographic variables, endoscopic findings, seasonal distribution, medication history, and transfusion requirements, this study provides a multifaceted analysis of UGIB that transcends single-variable assessments frequently observed in prior research. The integration of both Rockall and Blatchford scoring systems within the same cohort contributes to the limited body of evidence comparing prognostic tools in real-world settings. Additionally, finding that more people have UGIB during late spring and early summer suggests new ideas about how environmental or lifestyle factors might affect the risk of bleeding, which needs to be looked into more.

CONCLUSION

As a result, this study reveals that many variables such as age, comorbidity, medication use and *H. pylori* infection should be taken into consideration in the clinical management of UGIB. Especially in individuals at risk, early diagnosis, prophylactic treatment and regular follow-up can reduce both bleeding frequency and treatment costs. Our study may enrich epidemiological data on the management of patients with UGIB and shed light on future prospective studies.

ETHICAL DECLARATIONS

Ethics Committee Approval

The Karadeniz Technical University Clinical Researches Ethics Committee granted approval for this study (Date: 24.01.2013, Decision No: 2012/147).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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