Urgent endoscopy in elderly patients with non-variceal upper gastrointestinal bleeding

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Abstract

Introduction: *Age of the patient is an important prognostic factor in patients with non-variceal upper gastrointestinal bleeding (UGIB). Despite that fact, current treatment algorithms do not differentiate UGIB management according to the patient's age.*

Aim: *To compare treatment outcomes in patients below and above 75 years of age, treated for UGIB with urgent endoscopy.*

Material and methods: *Prospective analysis of treatment outcomes in 295 patients with non-variceal UGIB divided into two age groups (group A < 75 years of age, group B > 75 years of age). Urgent endoscopy (up to 3 h since admission) was performed in 292 patients. The groups were compared in regards to the duration of symptoms, previous UGIB, presence of factors predisposing to UGIB (NSAIDs, peptic ulcer disease, liver cirrhosis, and previous gastrointestinal surgery), haemodynamic state and haemoglobin (Hb) levels on admission. We analysed the causes of UGIB, severity of UGIB on the Forrest scale, type of endoscopic bleeding control method, and co-morbidities with use of the Charlson Co-morbidity Index (CCI). Treatment outcomes were assessed in regard of mortality rate, UGIB-recurrence rate, duration of hospital stay, amount of transfused blood products and the requirement of intensive therapy unit (ITU) or other departments' admissions. Patients were followed until their discharge home.*

Results: *Mortality rate was 6.8% (group A vs. B: 3.5% vs. 18.7%; p = 0.001). Upper gastrointestinal bleeding recurrence was noted in 12.2% of patients (group A vs. B: 12.5% vs. 10.9%; p = 0.73). 2.4% of patients required surgery for UGIB (group A vs. B: 1.7% vs. 4.7%; p = 0.16). Patients in group B required ITU admission more frequently (group A vs. B: 1% vs. 4.7%; p < 0.01). The mean hospital stay (4.3 days) and the mean number of transfused packed red blood cells (PRBCs) (2.35 Units) did not differ between the groups. Patients in group B used NSAIDS much more frequently, more often had hypovolaemic shock and had a higher CCI score.*

Conclusions: *Urgent endoscopy is an important and broadly accepted method of treatment of UGIB. Despite strict adherence to the modern UGIB-treatment algorithms, mortality remains high in the elderly. Thus, these patients need particular attention. The presented study indicates that the standard management might not be sufficient in elderly patients.*

Key words: *urgent endoscopy, gastrointestinal bleeding, elderly patients.*

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Introduction

Age of the patient is an important prognostic factor used in several scales assessing a patient's condition and in predicting a treatment's outcomes [1, 2]. In many conditions advanced age is a negative prognostic factor, as is also the case in upper gastrointestinal bleeding (UGIB) [3-7]. Despite this fact, current guidelines do not differentiate UGIB management based on the age of the patient. The treatment is the same for all patients and it includes initial compensation of the haemodynamic instability, followed by gastroscopy accompanied by endoscopic provision of haemostasis and finally, intravenous proton pump inhibitors infusion.

Surgical management of UGIB is reserved only for patients in whom endoscopic control of the bleeding has been unsuccessful [8-13]. In the last decade, such a combined approach has led to the reduction of UGIB-related mortality to 6-10% [9, 12]. Nevertheless, in patients aged 75 or more, UGIB-related mortality risk increases six-fold [14, 15]. The ageing of populations and advances in endoscopic management and medical care have contributed to a situation where around 25% of patients with UGIB are elderly. Thus, there is an important question of how to manage these patients. Evaluation of outcomes should be performed to assess if current UGIB management in elderly patients is appropriate.

Aim

The aim of this study was to compare outcomes of UGIB management with use of urgent endoscopy in patients older and younger than 75 years.

Material and methods

This prospective study recruited 295 patients with non-variceal UGIB, treated during the timeframe of 2005-2008 in Medical University Hospital No. 1 *Collegium Medicum* Nicolaus Copernicus University in Bydgoszcz, Poland. We used our own questionnaire to assess patients and outcomes. Patients were divided into two groups: group A (patients < 75 years old) – 231 subjects, group B (patients ≥ 75 years old) – 64 subjects.

The age limit was based on the cut-off point of the ROC curve for accuracy (ACC) equal to 80%. The chosen cut-off point was significantly better than random selection ($\chi^2 = 18.5$; $p < 0.001$) (Figure 1).

Urgent endoscopy was performed in all patients admitted with the suspicion of UGIB. Gastroscopy was performed within 3 h of admission, following correction of fluid and electrolyte imbalances.

Endoscopic control of bleeding was done in cases classified as Forrest Ia-IIb UGIB. The mode of haemostasis provision and the qualification for surgical management were not standardized. Different haemostatic procedures were used including injections of adrenaline, argon plasma coagulation (APC) and haemostatic clips.

Before endoscopy patients were receiving a bolus of pantoprazole 80 mg followed by continuous infusion until their return to an oral diet (usually one full day). Then, proton pump inhibitors were administered per os. In-hospital eradication of *Helicobacter pylori* was not routine.

Collected data were analysed in regards to the hypothesis of correlation with Student's t-test for independent groups and χ^2 Pearson's test. Kolmogorov-Smirnov and Levene's tests were also used; for small groups' statistics appropriate corrections were applied whenever needed. Statistical analysis was performed in two ways. First, groups A and B were compared to assess homogeneity in regard to the duration of the symptoms, previous occurrence

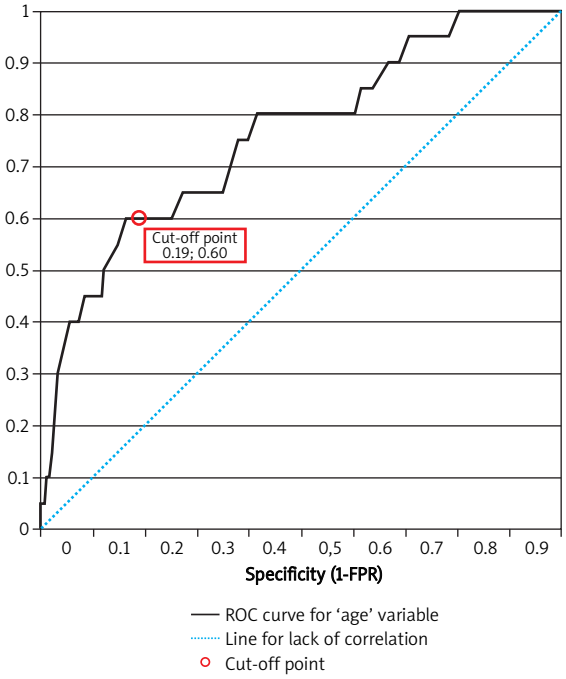

Figure 1. ROC curve for variable 'age' in respect of parameter 'death'. Proposed cut-off point is 75 years of age

of UGIB, UGIB-predisposing factors (non-steroid anti-inflammatory drugs [NSAIDs], peptic ulcer disease, liver cirrhosis, past gastrointestinal surgery), haemodynamic stability and haemoglobin (Hb) level on admission. Intra-group analysis assessed causes of UGIB, its severity based on Forrest's scale and the type of endoscopic intervention. Co-morbidities and associated risks were evaluated using the Charlson Comorbidity Index scale (CCI) [16-19].

Assessment of treatment outcomes was based on mortality, UGIB recurrence, length of hospitalization, number of operations, number of blood product transfusions, and need for management in the Intensive Therapy Unit or other departments.

Patients were followed during the whole hospitalization until their discharge. Upper gastrointestinal bleeding recurrence was defined as:

- endoscopically confirmed recurrent UGIB,
- drop in the Hb level by more than 2 g/dl in 24 h despite packed red blood cells (PRBCs) transfusion,
- recurrence of haemodynamic instability, haematemesis or melaena following a period of transient stabilization.

Results

During the study period 295 patients (114 female and 181 male) were hospitalized due to UGIB. The mean age in group A (< 75 years) was 55.5 ±12.7 years, and in group B (≥ 75 years) was 82.7 ±5.6 years ($p < 0.01$). The majority of patients in group B were female (62.5%; $p < 0.01$). Almost all patients self-presented to the Emergency Department as urgent cases. Only 9.1% of patients in group A and 7.8% of patients in group B were patients admitted for other causes who developed UGIB during their stay in the hospital (p = NS).

Table I. Severity of UGIB assessed according to Forrest's scale

Forrest	Group A (< 75 years) (*n*)	Group B (≥ 75 years) (*n*)	Total (*n*)
IA	13	1	14
IB	139	44	183
IIB	29	8	37
IIA	16	3	19
IIC	1	1	2
III	16	2	18
Not specified	17	5	22
Total	231	64	295

n – number of patients

The mean time between onset of symptoms and treatment was similar in both groups, 1.6 and 1.7 days respectively. Most of the UGIB occurrences were the first incident. In group A, it was a second episode of UGIB in 12% of patients, 6% having had a previous episode within the preceding 12 months, and in 4% of patients there were multiple previous episodes; and in group B, these proportions were 12%, 5% and 2% respectively (p = NS).

Analysis of predisposing factors showed significant differences between the two groups ($p < 0.01$). Elderly patients more frequently utilized NSAIDs (group B vs. group A: 63% vs. 32%), and less frequently suffered from peptic ulcer disease (26% vs. 35%), liver cirrhosis (6% vs. 25%) or previous gastrointestinal surgery (6% vs. 9%).

CCI scores, and therefore the number of co-morbidities, differed significantly between the groups (group A vs. B, points, mean ± SD: 3.9 ±2.8 vs. 7 ±1.8; $p < 0.01$).

On admission, older patients were more frequently in worse haemodynamic condition. Hypovolaemic shock was diagnosed on admission in 39% of patients in group B, while in group A only in 14% of patients ($p < 0.01$). At the same time, the initial Hb levels did not differ significantly between the groups (group A vs. B: 9.2 vs. 9.0 g/dl; p = NS).

Urgent endoscopy was performed in 292 patients. Three patients (all in group A) were managed conservatively. Among them, one did not agree to have endoscopy and the remaining two patients were severely unstable and dying on arrival at the hospital. Endoscopic evaluation of the causes of UGIB showed that the most frequent source was a gastric peptic ulcer (28%) or duodenal peptic ulcer (26%). Less frequent causes include acute gastritis or duodenitis (17.6%), GI cancer (8.5%), Mallory-Weiss syndrome (8.5%) and other causes (6.4%). The cause of UGIB was not established in 5% of patients despite endoscopic examination. Malory-Weiss syndrome was more frequent in group A than B ($p < 0.01$), while neoplastic disease was more frequent in group B than A ($p = 0.07$). Severity of the haemorrhage was assessed according to the Forrest scale and is presented in Table I. There were no sta-

tistically significant differences in severity of UGIB between groups.

Endoscopic control of bleeding was performed in 89.4% of all gastroscopies. The most frequently used technique was adrenalin injections (78% of all endoscopic interventions); less frequently argon coagulation (20%) or haemostatic clips (14%) were used. Application of two different haemostatic interventions was required in 12% of cases. The groups did not differ significantly in regards to the haemostatic technique used.

The most important measures of treatment effectiveness such as the death rate and UGIB recurrence rate were assessed in the whole material and then subgroup analyses were performed. There were 20 (6.8%) mortalities due to the UGIB. Three patients died when in ITU and one during the surgery. Upper gastrointestinal bleeding recurrence occurred in 36 patients (12.2%). There was a statistically significant difference in mortality between the two groups with a significant advantage for younger patients. 3.5% of patients died in group A, while 18.7% of patients died in group B ($p < 0.001$). The UGIB recurrence rate was similar in both groups (group A vs. B; 12.5% vs. 10.9%; $p = 0.73$). The mode of treatment used for UGIB recurrence was the same in both groups. Most frequently endoscopy was repeated (24 patients); less frequently a repeat endoscopy was followed by surgery (5 patients), surgery was performed without repeat endoscopy (4 patients) or only conservative management was used (3 patients).

2.4% of patients underwent surgery because of UGIB and in this respect the groups were similar (group A vs. B: 1.7% vs. 4.7%; $p = 0.16$). Elderly patients were more frequently transferred to other hospital departments (group A vs. B: 10% vs. 34%; $p < 0.001$). Likewise, a higher percentage of patients in group B required ITU treatment (group A vs. B: 1% vs. 4.7%; $p < 0.01$). Other measures of quality and outcomes of UGIB management such as hospitalization time and the number of transfused blood products were similar for both groups. The mean hospitalization time was 4.3 days and patients received a mean of 2.35 IU of PRBCs.

Discussion

The presented study showed that older patients (mean age: 83 years) in comparison to younger patients (mean age: 56 years) have a significantly increased risk of death (18% vs. 3.5%; $p < 0.001$) related to upper gastrointestinal bleeding, despite the same endoscopic management protocol. The main predisposing factors found in the older population with UGIB are multiple co-morbidities, high relative risk of cancer-related UGIB, high oral intake of NSAIDs and a worse haemodynamic state on admission. During the treatment course elderly patients more frequently require ITU admission or further management in other departments.

Not only in UGIB is advanced age a risk factor of death. Exceeding 60 years of age results in a higher incidence of cancer, and an increased risk of cerebrovascular and cardiovascular events [20-22]. At the same time technological progress in medicine, pharmacotherapy and minimally invasive procedures allow successful treatment of patients in worse condition than a few decades ago. Aggregated data analysis proves progressively improving outcomes of several therapies, including in UGIB. In many publications, age is referred to as a significant risk factor of mortality and recurrence of UGIB [2, 3, 13, 23]. The standard UGIB-management protocol that is sufficient in an average patient might be unsuitable (or less effective) in elderly patients. The presented study proves that patients with UGIB, aged over 75 years, require particular attention and some changes in the management.

There were no significant differences between the groups in regard of the duration of symptoms of UGIB, mode of admission, number of previous episodes of UGIB or initial Hb levels on admission. Elderly patients more frequently used NSAIDs and had more co-morbid conditions. It might have a particular impact as the use of NSAIDs is a well-known risk factor for UGIB occurrence especially when NSAIDs are used on an 'as required' basis without the cover of a proton pump inhibitor [24].

Among other risk factors of failure of UGIB treatment haemodynamic condition and full blood count on admission are particularly important. Hypovolaemic shock and low Hb level significantly increase the risk of death [7]. In the analysed material, patients over 75 years of age suffered hypovolaemic shock more frequently, though the mean Hb level did not differ significantly between groups. It confirms the fact that elderly patients have worse blood loss tolerance and that they develop haemodynamic instability earlier. The presented study shows that in

patients over 75 years of age oral intake of NSAIDs, haemodynamic state and the number of co-morbidities are the most significant predictive factors of treatment outcome.

The severity of UGIB assessed using Forrest's scale, mode of patients' management, mode of endoscopic intervention, amount of transfused blood derivative products or the duration of hospital stay did not differ between the groups.

Urgent endoscopy plays a crucial and broadly accepted role in UGIB management algorithms. However, presented outcomes and data from world literature show that in the case of elderly patients the standard management might not be sufficient. Although the frequency of UGIB recurrence is similar in both groups, the mortality rate among elderly patients was increased five-fold in comparison to younger patients. Most probably, in elderly patients haemostatic imbalance and exacerbation of co-morbid conditions plays an important role.

A patient of advanced age is a challenge for modern medicine despite the type of the disease. Also in UGIB the treatment outcome is difficult to predict and the mortality rate increases with age. The presented study demonstrates that elderly patients with UGIB need particular attention despite strict adherence to the standardized modern therapeutic procedures.

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