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ORIGINAL ARTICLE

Multidimensional prognostic index in Egyptian elderly with acute gastrointestinal bleeding

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Abstract

Introduction:

Gastrointestinal bleeding is a frequent cause of hospital admissions in older adults with relatively high mortality. Comprehensive geriatric assessment (CGA) is a multidimensional tool for adequately evaluating the elderly. Our study aimed to evaluate the usefulness of the CGA, including the multidimensional prognostic index (MPI), in elderly patients hospitalized for acute upper gastrointestinal bleeding (AUGIB). Moreover, our study aimed to identify the possible risk factors for unfavorable outcomes and mortality.

Methods:

This study was designed to analyze data from elderly patients aged ≥65 years with AUGIB. They were followed for one month.

Results:

The study included 166 patients aged ≥65 years, 90 males and 76 females; their ages ranged from 65-91 with a mean ± SD of 72.7 ± 6.5. In descending order, the most common endoscopic causes of AUGIB were esophageal varices (35.5%), peptic ulcer (27.1), erosive gastritis (9.6%), esophageal ulcer (7.8%), antral gastritis (5.4%), gastric mass (3.6%), post band ulcer (2.4%), and angiodysplasia (1.2%). Furthermore, the results revealed a statistically significant difference between the mortality and Rockall scores, with a P-value of 0.002. Besides, the data showed a strong correlation between the incidence of mortality and CGA with a P-value of < 0.001. Our study showed a strong positive correlation between MPI, Blatchford score, Rockall score, and days of hospital stay. Moreover, it revealed a strong relation between MPI and mortality (P-value <0.001). Conclusion: A comprehensive geriatric assessment of the elderly with a calculation of MPI can predict the outcome of upper gastrointestinal bleeding.

Keywords:

Acute upper gastrointestinal bleeding; elderly; CGA; Adverse outcome

Introduction:

Gastrointestinal bleeding is a frequent cause of hospital admissions[1, 2] in older adults with relatively high mortality[3]. Over 1% of people aged 80 years and older are hospitalized yearly because of gastrointestinal bleeding[2].

Furthermore, in several reports in the literature, older patients with advanced cardiovascular, respiratory, or cerebrovascular diseases showed an increased risk of death from acute UGIB[4].

In older adults, morbidity and mortality from gastrointestinal bleeding are determined by the nature of the bleeding lesion and comorbid medical conditions.

Age is an independent risk factor for mortality in UGIB; however, the greater consumption of non-steroidal anti-inflammatory agents and anticoagulants is considered the most prevalent causal risk factor[5].

Elderly patients require special evaluation, early risk assessment, proper resuscitation, and an attempt to identify and treat the bleeding source[5].

Comprehensive geriatric assessment is a multidimensional tool for properly evaluating the elderly to determine their medical, psychosocial, and functional capacity[6].

The promising outcomes of acute UGIB in the elderly require a coordinated approach with the involvement of acute care specialists, advances in diagnostic and therapeutic endoscopy, powerful acid-suppressive and vasoactive agents, and less invasive surgical approaches[7].

Aim of the work:

The study included 166 patients aged ≥65 years. The study aimed to evaluate the usefulness of the CGA, including MPI, in elderly patients hospitalized for AUGIB and identify the possible risk factors for unfavorable outcomes and mortality in such a cohort.

Methods:

Patients: This study was designed to analyze data from patients aged ≥65 years who presented with AUGIB. Our institution's Research Ethics Committee approved the study, and informed consent was obtained from all participants or, if patients could not provide consent, from designated surrogates before inclusion.

All the patients included in the study were subjected to thorough history taking, including age, gender, comorbid diseases (diabetes, hypertension, liver disease, renal disease, cardiac disease, and malignancy), and concomitant medications (NSAIDs, antiplatelets, or anticoagulants). The clinical assessment included the Blatchford and Rockall score to assess the severity of the GI bleeding and routine laboratory investigations in the form of CBC, LFTs, KFTS, electrolytes, and virology screening. All patients underwent a CGA, including activities of daily living (ADL), instrumental activities of daily living (IADL), the short portable mental status questionnaire (SPMSQ), the mini nutritional assessment (MNA), the Exton-Smith score (ESS), and the comorbidity index rating scale (CIRS). An MPI was calculated from the integrated total scores and expressed as MPI 1 = low risk, MPI 2 = moderate risk, and MPI 3 = severe risk. The endoscopic findings, management, need for blood transfusion, and hospital stay were recorded. Moreover, adverse events such as re-bleeding, shock state, infection, aspiration, deterioration of the consciousness level, need for ICU admission, and GI bleeding-related mortality were recorded. All patients were followed up for one month.

Statistical analysis:

Data were coded and entered using the Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corp., Armonk, NY, USA). Data were summarized using mean and standard deviation for quantitative variables and frequencies (number of cases) and relative frequencies (percentages) for categorical variables. Comparisons between groups were conducted using an unpaired t-test. The Chi-square ($\chi 2$) test was performed to compare categorical data. An exact test was used when the expected frequency was less than 5. Correlations between quantitative variables were performed using the Pearson correlation coefficient. P-values less than 0.05 were considered statistically significant.

Results:

The study included 166 patients aged ≥65 years, 90 males and 76 females; their ages ranged from 65-91, with a mean ± SD of 72.7 ± 6.5, as shown in Table 1.

Table 1: age and sex of patients.

		Mean or count	SD or percentage %
age		72.7	5.67
Sex	Female	76	45.8%
	Male	90	54.2%

SD: standard deviation. P-value < 0.05 is significant.

Female patients showed a higher incidence of HTN and renal impairment with P-values of 0.008 and 0.001, respectively. However, there was no statistically significant difference between both genders as regards the presence of diabetes, ischemic heart disease, hepatic disease, or other comorbidities (P-value >0.05), as described in Table 2.

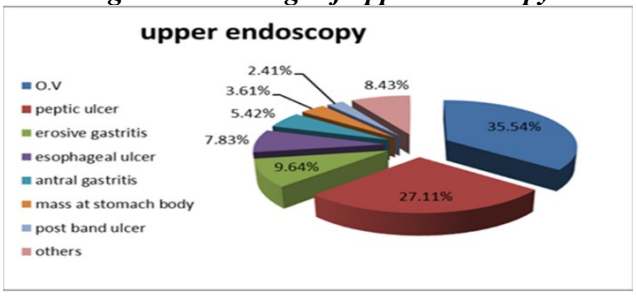
Table 2: Comparing both genders as regarding medical conditions:

		Male		Female		P value
		Count	%	Count	%	
DM	Yes	29	32.2%	33	43.4%	0.137
	No	61	67.8%	43	56.6%	
HTN	Yes	28	31.1%	39	51.3%	0.008
	No	62	68.9%	37	48.7%	
IHD	Yes	12	13.3%	11	14.5%	0.832
	No	78	86.7%	65	85.5%	
RI	Yes	3	3.3%	14	18.4%	0.001
	No	87	96.7%	62	81.6%	
hepatic	Yes	43	47.8%	39	51.3%	0.650
	No	47	52.2%	37	48.7%	
CHILD score	C	16	37.2%	7	17.9%	0.153
	B	16	37.2%	19	48.7%	
	A	11	25.6%	13	33.3%	
Other comorbidities	Yes	9	10.0%	15	19.7%	0.076
	No	81	90.0%	61	80.3%	

DM: diabetes mellitus, HTN: hypertension, IHD: ischemic heart disease, RI: renal impairment, CHILD score: Child-Pugh Score. P-value < 0.05 is significant.

Regarding the upper endoscopic findings, it showed that the most common findings, in descending order, were esophageal varices (35.5%), peptic ulcer (27.1), erosive gastritis (9.6%), esophageal ulcer (7.8%), antral gastritis (5.4%), gastric mass (3.6%), post band ulcer (2.4%), and angiodysplasia (1.2%), as shown in Figure 1.

Figure 1: Findings of upper endoscopy.



OV: Oesophageal varices.

There is a statistically significant difference between the mortality and Rockall score with a P-value of 0.002; meanwhile, there is no statistically significant difference with the Blatchford score (P-value = 0.169), as shown in Table 3.

Table 3: Correlation between mortality, Blatchford score and Rockall score.

	Mortality		Survival		P value
	Mean	SD	Mean	SD	
Blatchford score	14.49	2.76	13.77	3.37	0.169
Rockall score	4.53	1.96	3.59	1.44	0.002

P-value < 0.05 is significant.

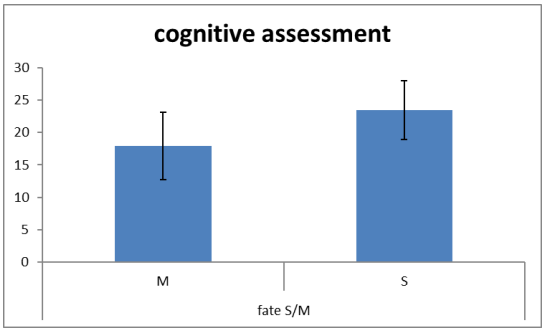
The results revealed a strong relationship between cognitive and nutritional assessment and mortality, with a significant difference (P-value < 0.001). The mortality rate increased in patients with a low cognition and nutrition assessment score and vice versa, as shown in Table 4 and Figure 2.

Table 4: Relation between mortality and both cognitive and nutrition assessment.

	fate Survival/ Mortality				
	Mortality		Survival		P value
	Mean	Standard Deviation	Mean	Standard Deviation	
cognitive assessment	17.89	5.22	23.43	4.50	< 0.001
nutritional assessment	16.55	3.14	19.59	4.11	< 0.001

P- < 0.05 is significant.

Figure 2: Relation between mortality and cognitive assessment.



S: survival, M: mortality.

Furthermore, there is a strong correlation between the incidence of mortality and CGA with a P-value of < 0.001, as shown in Table 5.

Table 5: Correlation between mortality and CGA.

	Mortality		Survival		P value
	Mean	SD	Mean	SD	
cognitive assessment	17.89	5.22	23.43	4.50	< 0.001
nutritional assessmant	16.55	3.14	19.59	4.11	< 0.001
exton smith scale	13.24	3.62	17.33	2.18	< 0.001
C.I.R.S	2.65	0.62	2.24	0.91	0.001
MPI	0.64	0.14	0.43	0.09	< 0.001

CGA: Comprehensive geriatric assessment, CIRS: Comorbidity Index Rating Scale, MPI: Multidimensional prognostic index. P-value < 0.05 is significant.

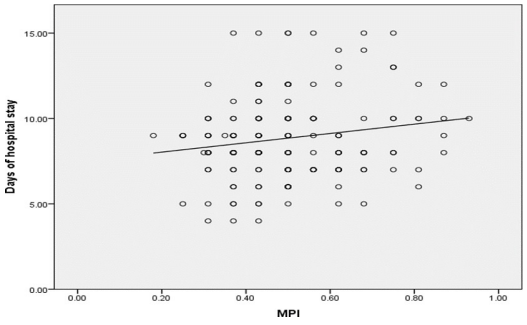
In addition, there is a strong positive correlation between the multidimensional prognostic index (MPI), Blatchford score, Rockall score, and days of hospital stay, as shown in Table 6 and Figure 3.

Table 6: Correlation between MPI and prognostic scores (Blatchford score, rockall score) and days of hospital admission).

	MPI		
	Pearson Correlation	**P value**	**N**
Blatchford score	**0.162**	**0.037**	**166**
Rockall score	**0.406**	**< 0.001**	**166**
Days of hospital stay	**0.171**	**0.027**	**166**

MPI: multidimensional prognostic index. P-value < 0.05 is significant.

Figure 3: Correlation between MPI and duration of hospital stay in days.



MPI: Multidimensional prognostic index.

The study revealed a strong relationship between MPI and mortality (P-value <0.001), as shown in Table 7.

Table 7: Relation between MPI and mortality.

		MPI		P value
		Mean	**Standard Deviation**	
fate S/M	**Survival**	**0.43**	**0.09**	**< 0.001**
	Mortality	**0.64**	0.14	

P-value < 0.05 is significant.

Discussion:

Gastrointestinal bleeding is a frequent cause of hospital admissions(1, 2) in older adults with relatively high mortality(3). They are a vulnerable group of patients as they are subjected to multiple health problems and greater consumption of drugs used in their treatment, such as NSAIDs, antiplatelets, or anticoagulants, which may lead to acute upper gastrointestinal bleeding (UGIB)(8, 9).

The promising outcomes of acute UGIB in the elderly need a coordinated approach with the involvement of acute care specialists, advances in diagnostic and therapeutic endoscopy, powerful acid-suppressive and vasoactive agents, and less invasive surgical approaches[7].

The study aimed to evaluate the usefulness of the CGA, including MPI, in elderly patients hospitalized for AUGIB and identify the possible risk factors for unfavorable outcomes and mortality in such a cohort.

The CGA included activities of daily living (ADL), instrumental activities of daily living (IADL), the short portable mental status questionnaire (SPMSQ), the mini nutritional assessment (MNA), the Exton-Smith score (ESS), the comorbidity index rating scale (CIRS), and the MPI which were calculated to all patients.

Our study included 166 patients aged ≥65 years, 90 males and 76 females; their ages ranged from 65-91 with a mean ± SD of 72.7 ± 6.5. Most of our patients were males, which matches Esmat et al. 2002[10], and Rockall et al. 1995[11].

This could be explained by the fact that in European countries, males consume more excess alcohol and have more chronic liver diseases than females. In Egypt, males are more liable for exposure to Schistosoma infection and viral hepatitis than females, as reported by Esmat et al., 2002[10].

The study showed a significantly higher incidence of HTN and renal impairment in female patients, with P-values of 0.08 and 0.001, respectively. However, there was no statistically significant difference between both genders as regards the presence of diabetes, ischemic heart disease, hepatic disease, or other comorbidities (P-value >0.05).

The most common endoscopic causes of UGIB in the elderly patients in our study were esophageal varices (35.5%) and peptic ulcers (27.1%). This may be explained by our country's high incidence of viral infections (HCV infections).

In our study, 6 patients (3.6%) had gastric masses. This agrees with the Savides et al. study, which concluded that neoplasms of the upper gastrointestinal (GI) tract are an uncommon cause of upper GI bleeding and account for less than 5% of all cases of severe upper GI bleeding[12].

Regarding the scoring systems for assessing the severity of upper GI bleeding, we found a significant difference between the mortality rate and the Rockall score, which may conclude that the Rockall score can be used as a good predictor for mortality in the elderly.

As we demonstrated, the patient with a low score on cognition and nutrition assessments had a higher mortality rate, and vice versa; thus, impaired cognitive function was associated with increased mortality. Moreover, malnutrition is associated with higher mortality with a P-value of <0.001. Therefore, malnutrition and impaired cognitive function can predict worse outcomes.

We found a strong correlation between the incidence of mortality and CGA. There was an increase in the mortality rate in patients with low scores.

The data revealed a strong positive correlation between the multidimensional prognostic index (MPI) and the Blatchford score, Rockall score, and days of hospital stay. Higher MPI indicates higher Blatchford and Rockall scores, which means a higher risk of adverse outcomes (P-value = 0.037, < 0.001, and 0.027, respectively). Higher MPI indicates more extended hospital stays and delayed recovery of patients.

Our study revealed a strong relationship between MPI and mortality (P-value <0.001); the higher the MPI, the higher the mortality rate.

So comprehensive geriatric assessment of the elderly with the calculation of MPI can predict the outcome of upper gastrointestinal bleeding, which matches Alberto et al., 2007[6].

Conclusion:

A comprehensive geriatric assessment of the elderly with a calculation of MPI can predict the outcome of upper gastrointestinal bleeding.

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