Original article

Evaluation of risk factors, endoscopic characteristics, and severity in patients with acute esophageal variceal bleeding

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Abstract

Background: Upper gastrointestinal bleeding (UGIB) is a medical and surgical emergency with a poor prognosis. Upper gastrointestinal endoscopy remains the gold standard for diagnosing esophageal variceal. However, the integration of risk factors, clinical and endoscopic findings plays a crucial role in formulating treatment strategies, prognostication, and preventing rebleeding in patients with Upper gastrointestinal bleeding.

Subjects and methods: A cross-sectional study conducted on 38 patients with Acute esophageal variceal Bleeding at the Gastrointestinal Endoscopy Center, Hue University of Medicine and Pharmacy Hospital from November 2023 to November 2024.

Results: Melena was the most common symptom in patients with Acute esophageal variceal bleeding . Grade III esophageal variceal were the most common endoscopic finding, present in 65.9% of patients. Other endoscopic findings included: cherry red spots: 57.8%; red wale marks: 26.3%; diffuse redness: 8.1%; blood blisters: 7.8%. Lower platelet counts were associated with more severe gastrointestinal bleeding. Grade III esophageal variceal and red wale marks were the most common findings across all severity of gastrointestinal bleeding.

Conclusion: Acute esophageal variceal bleeding is a life-threatening complication with high mortality. Risk factors such as medical history, hemoglobin levels, platelet counts, and endoscopic characteristics are related to the extent of bleeding for these patients.

Keywords: *Upper gastrointestinal bleeding, esophageal variceal, risk factors.*

1. INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is a medical and surgical emergency with a poor prognosis. The estimated annual incidence rate worldwide is 15 - 172 cases per 100,000 population [1]. According to the World Gastroenterology Organisation, esophageal variceal are recorded in approximately 30% of patients with liver cirrhosis and increase to 90% after about 10 years. Although esophageal bleeding may stop spontaneously in 40% of patients, the mortality rate remains as high as 20% within the first 6 weeks [2]. Upper gastrointestinal endoscopy remains the gold standard for diagnosing esophageal variceal. However, the integration of risk factors, clinical and endoscopic findings plays a crucial role in formulating treatment strategies, prognostication, and preventing rebleeding in Upper gastrointestinal bleeding group.

Therefore, we conducted research with the following aim:

1. Describing the risk factors and endoscopic characteristics in patients with Acute esophageal variceal bleeding.

2. To survey the relationship between risk factors, endoscopic findings, and severity in patients with Acute esophageal variceal bleeding.

2. RESEARCH SUBJECTS AND METHODS

2.1. Research subjects

The patients with acute e sophageal variceal bleeding at the Gastrointestinal Endoscopy Center, Hue University of Medicine and Pharmacy Hospital from November 2023 to November 2024.

Inclusion Criteria: (1) Age > 18 years, (2) Patients diagnosed with Acute esophageal variceal bleeding . (3) Patients who underwent esophagogastroduodenoscopy (EGD) revealed esophageal variceal.

Exclusion Criteria: (1) Bleeding from other organs. (2) Patients declinied to participate in the study. (3) Patients have contraindications for esophagogastroduodenoscopy

2.2. Methods

A cross-sectional study

3. RESEARCH RESULTS

3.1. General characteristics

Table 1. General Characteristics

Age Group	Male		Female		Total	
	n	%	n	%	n	%
< 40	3	8.6	0	0	3	7.9
40 - 60	28	80.0	1	33.3	29	76.3
> 60	4	11.4	2	66.7	6	15.8
Total	35	100	3	100	38	100

The incidence rate in female is lower than males. The 40–60 age group accounts for the highest proportion.

3.2. Risk factors and endoscopic characteristics in patients with acute esophageal variceal bleeding.

3.2.1. Reason for admission to hospital

Table 2. Reasons for admission

Characteristic	Number (n)	Percentage (%)
Melena	22	57.9
Hematemesis	16	42.1
Total	38	100

Melena was the most common symptom in patients with acute esophageal variceal bleeding.

3.2.2. Biochemical and hematological

Table 3. Biochemical and hematological

Index	Mean ± SD	Minimum	Maximum
WBC ($x10^9$/L)	7.25 ± 3.82	1.23	20.15
RBC ($x10^{12}$/L)	2.77 ± 0.77	1.63	4.87
HGB (g/dL)	8.04 ± 2.85	3.70	15.80
PLT ($x10^9$/L)	111.18 ± 47.42	30	257
AST (U/L)	86.05 ± 78.91	22.90	394.70
ALT (U/L)	35.26 ± 26.49	10.00	135.00
Albumin (g/L)	29.69 ± 5.97	18.10	42.20

The mean hemoglobin and platelet count were all decreased.

3.2.3. Characteristics of endoscopic esophageal variceal

Table 4. Esophagogastroduodenoscopy findings

Characteristic	Number (n)	Percentage (%)
Variceal - Grade II	13	34.1
Variceal - Grade III	25	65.9
Cherry red spots	22	57.8
Red wale marks	10	26.3
Diffuse redness	4	8.1
Blood blisters	2	7.8
Total	38	

Grade III esophageal variceal (65.9%) were the most common finding. Cherry red spots, red wale marks, diffuse redness, blood blisters were 57.8%, 26.3%, 8.1%, and 7.8%, respectively.

3.3. The relationship between risk factors and endoscopic characteristics and the severity of acute esophageal variceal bleeding.

3.3.1. The relationship between platelet count and the severity of upper gastrointestinal bleeding

Table 5. The relationship between platelet count and the severity of upper gastrointestinal bleeding

Platelet	Severity of upper gastrointestinal bleeding						P
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
< 150	6	85.7	16	80.0	9	81.8	> 0.05
150 - 450	1	14.3	4	20.0	2	18.2	
> 450	0	0.,0	0	0.0	0	0.0	
Total	7	100	20	100	11	100	

Lower platelet counts were the most common in all acute esophageal variceal bleeding.

3.3.2. The relationship between albumin concentrations and the severity of gastrointestinal bleeding

Table 6. The relationship between albumin concentration and the severity of gastrointestinal bleeding

Albumin	Severity of upper gastrointestinal bleeding						P
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
< 25	1	14.3	5	25.0	2	18.2	0.314
25 - 30	0	0.0	5	25.0	5	45.5	
30 - 35	5	71.4	6	30.0	3	27.3	
> 35	1	14.3	4	20.0	1	9.1	
Total	7	100	20	100	11	100	

There was no significant association between albumin concentration and the severity of gastrointestinal bleeding.

3.3.3. The relationship between the degree of esophageal variceal and the severity of gastrointestinal bleeding

Table 3. The relationship between the characteristics of esophageal variceal and the severity of gastrointestinal bleeding

Variceal	Severity of gastrointestinal bleeding						P
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
Grade II	2	14.3	6	20.0	5	36.4	> 0.05
Grade III	5	71.4	14	70.0	6	54.5	
Total	7	100	20	100	11	100	

Grade III esophageal variceal were the most common in all severity of gastrointestinal bleeding.

3.3.4. The relationship between endoscopic features of esophageal variceal and the severity of gastrointestinal bleeding

Table 8. The relationship between endoscopic features and the severity of gastrointestinal bleeding

Endoscopic features of esophageal variceal	Severity of gastrointestinal bleeding						P
	Mild		Moderate		Severe		
	n	%	n	%	n	%	
Cherry red spots	4	57.1	11	55.0	7	63.6	0.896
Red wale marks	1	14.3	6	30.0	3	27.3	0.716

Diffuse redness	0	0	1	5.0	1	9.2	0.699
Blood blisters	2	28.6	2	10.0	0	0	0.156

Red wale was the most common in all severity of gastrointestinal bleeding.

4. DISCUSSION

4.1. General Characteristics

The patients aged 40 - 60 accounted were most common in the study group, which is consistent with the general demographic profile of patients with acute esophageal variceal bleeding. Lu Trong Nghia reported that the 40 - 65 age group accounted for the majority (70.0%). Males predominated 92.1%, while females constituted only 7.9%, a male-to-female ratio of 11.6:1. This suggests that cirrhotic patients with gastrointestinal bleeding complications are predominantly middle-aged, as cirrhosis is a chronic disease that progresses over many years. The gender disparity may be explained by alcohol being one of the most common causes of cirrhosis, with men consuming alcohol at higher rates than women. Additionally, co-infection with hepatitis B or C virus and alcohol use accelerates the progression of cirrhosis [3].

4.2. Risk factors and endoscopic characteristics in patients with acute esophageal variceal bleeding.

4.2.1. Reason for hospital admission.

In our study, melena was the most common presenting symptom (57.6%) in patients with acute esophageal variceal bleeding. The research of Ratiu (2022) show that 40.2% of patients were admitted due to melena, 8.4% due to hematemesis, and 32% due to both symptoms [4].

4.2.2. Biochemical and hematological

Hemoglobin levels and platelet counts tended to be low, with mean values of 8.04 ± 2.85 g/dL and 111.18 ± 47.42 × 10^9/L, respectively. Mean AST and ALT levels were 86.05 ± 78.91 U/L and 35.26 ± 26.49 U/L, respectively, with an AST/ALT ratio of 2.44. Albumin concentration averaged 29.69 ± 5.97 g/dL. These results are comparable to those of Han Ah Lee (2022), where mean AST and albumin concentration levels were 38.5 ± 49.7 U/L and 29.0 ± 2.0 g/dL, respectively [5]. Studies have demonstrated that platelet count is a significant predictor of bleeding risk in patients with liver cirrhosis with esophageal variceal [6].

4.2.3. Characteristics of endoscopic esophageal variceal

Grade III esophageal variceal were the most common (65.9%), followed by Grade II (34.1%). Cherry-red spots were the most common endoscopic feature (57.8%), followed by red wale marks (26.3%), diffuse redness (8.1%), and blood blisters (7.8%). A similar distribution was reported by Nguyen Thi Huyen Trang (2022), with Grade III variceal in 80.6%, Grade II in 15.8%, and Grade I in only 4% of cases [7]. This suggests that larger variceal are associated with a higher risk of bleeding.

4.3. The relationship between risk factors and endoscopic characteristics and the severity of acute esophageal variceal bleeding.

4.3.1. Relationship between Platelet count, albumin concentration, and severity of upper gastrointestinal bleeding

Among patients with platelet counts < 150 × 10^9/L, the proportions of mild, moderate, and severe bleeding were 85.7%, 80%, and 81.8%, respectively. In contrast, in those with platelet counts of 150 - 450 × 10^9/L, the corresponding rates were 14.3%, 20%, and 18.2%. Notably, no bleeding episodes were observed in patients with platelet counts > 450 × 10^9/L. Our findings are consistent with those of Dao Duc Tien, where patients with low platelet counts (high PALBI score) had a significantly higher risk of upper gastrointestinal bleeding [7]. The results suggest that thrombocytopenia (< 150 × 10^9/L) is an important risk factor for upper gastrointestinal bleeding, particularly in patients with underlying conditions such as liver disease, malignancies, or anticoagulant use.

Table 6 shows no statistically significant association between albumin concentration levels and bleeding severity. However, Zhu Wang demonstrated that albumin infusion in patients hospitalized for upper gastrointestinal bleeding reduced rebleeding risk ($p < 0.001$), suggesting that higher albumin concentration levels may mitigate bleeding risk [8].

4.3.2. Association between endoscopic characteristics and severity of upper gastrointestinal bleeding

The incidence of upper gastrointestinal bleeding increased with esophageal variceal: 23.6% (13/38) for Grade II and 64.7% (25/38) for Grade III. Cherry-red spots were the most common endoscopic feature, particularly in severe upper gastrointestinal bleeding (63.6%) and moderate UGIB (55%). This confirms that higher-grade variceal correlate with

more severe bleeding. A study by A. Ghweil found that large variceal significantly increase bleeding risk compared to small variceal. Additionally, red signs on endoscopy, number of variceal, portal hypertension, and gastric variceal also contribute to bleeding risk [9]. Our findings highlight the strong association between variceal grade, endoscopic characteristics and severity of upper gastrointestinal bleeding. These features are crucial for predicting bleeding risk and guiding clinical interventions.

5. CONCLUSION

Acute esophageal variceal bleeding is a life-threatening complication with high mortality. Risk factors such as medical history, hemoglobin levels, platelet counts, and endoscopic characteristics are related to the extent of bleeding for these patients.

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