Research Article

Analysis of factors influencing adverse outcome of patients with acute non variceal upper gastrointestinal bleeding

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Abstract Objective: To explore the risk factors affecting the adverse outcome of patients with acute non variceal upper gastrointestinal bleeding, and propose reference measures for early clinical intervention.

Methods: Take 70 patients with acute non variceal gastrointestinal bleeding diagnosed and treated in the emergency department of the Seventh Affiliated Hospital of Sun Yat sen University from March 2020 to January 2021 as the research object, collect their relevant clinical data. The main end point was the adverse outcome of patients at 1 year after discharge, including rebleeding and death, followed up by telephone. According to the outcome of follow-up, the patients were divided into two groups: adverse outcome group and no adverse outcome group. The factors that may affect the prognosis were analyzed.

Result: By the end point of follow-up, 39 patients in the adverse outcome group (23 cases of rebleeding, 16 cases of death), 31 patients in the no adverse outcome group. Single factor analysis showed that there were significant differences in albumin, hemoglobin, cholinesterase, blood transfusion, shock index and admission to ICU between the adverse outcome group and the non adverse outcome group (P<0.05). Multiple factors logistic regression analysis showed that albumin and blood transfusion were risk factors for long-term prognosis of patients with non variceal gastrointestinal bleeding (P<0.05).

Conclusion: A variety of factors will affect the incidence of long-term adverse outcomes in patients with acute non variceal upper gastrointestinal bleeding. Monitoring related biochemical indicators at admission, strict blood transfusion evaluation and blood transfusion management can, to some extent, assess the risk of adverse outcomes and reduce the incidence of adverse outcomes.

Keywords: Acute non variceal upper gastrointestinal bleeding; Adverse outcome; Factor analysis

Background

Upper gastrointestinal (GI) bleeding is defined as bleeding from the mouth to the Treitz ligament. The incidence of upper gastrointestinal bleeding varies from 48 to 160 cases per 100000 people[1].Acute upper gastrointestinal bleeding is one of the most common acute and critical cases in emergency department. The annual mortality of adults is 2% - 15%[2].Causes of upper GI bleeding include peptic ulcer bleeding,gastritis, esophagitis, variceal bleeding, Mallory-Weiss syndrome, and cancer[3].Acute non variceal gastrointestinal bleeding is an important reason for medical treatment, and has a high rate of rebleeding and mortality. There are many studies on the risk factors affecting the short-term prognosis of patients with gastrointestinal bleeding.The common influencing factors are previous upper gastrointestinal bleeding, use of anticoagulants, use of large doses of NSAIDs and older age. However, there are few studies on the factors affecting long-term rebleeding and death. How to reduce long-term rebleeding and mortality of such patients is the focus of our clinical

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attention.This study selected 70 patients with acute non variceal gastrointestinal bleeding diagnosed and treated in the Emergency Department of the Seventh Affiliated Hospital of Sun Yat sen University from March 2020 to January 2021, and analyzed their related clinical data to explore the risk factors affecting the long-term adverse outcome of patients with acute non variceal upper gastrointestinal bleeding.

Materials and Methods

1.1 Basic data

In this study, 70 patients aged from 18 to 86 were enrolled. 39 patients were in the adverse outcome group (23 patients with rebleeding and 16 patients died), and 31 patients were in the no adverse outcome group.

1.2 Inclusion and exclusion criteria

Inclusive criteria: (1) Age≥18 years; (2) Have a clear history of hematemesis or melena; (3) Non variceal gastrointestinal bleeding was clinically diagnosed. Exclusion criteria: (1) death in hospital; (2) Original coagulation dysfunction disease; (3) History of other serious kidney and liver diseases; (4) History of repeated bleeding (5) patients with liver cirrhosis; (6) Patients with incomplete medical records.

1.3 Methods

Data collection was started within 24 hours after admission. The general data of patients at admission were recorded, including age, albumin, globulin, cholinesterase, hemoglobin, blood transfusion, gastroscopic intervention, admission to ICU, and shock index.Taking the discharge time as a reference，They were followed up one year later, with the time error not exceeding 7 days; The adverse outcome (rebleeding or death) of the patient was recorded

by telephone inquiry. According to whether there were adverse outcomes.The patients were divided into adverse outcome group and no adverse outcome group.

1.4 Statistical methods

Use the SPSS 22.0 statistical software for data analysis. The counting data were expressed by rate and comparisons between groups useχ2 Inspection. The measurement data are expressed in mean±standard deviation (x±s).T-test was used to compare the mean values. Single factor analysis shall be conducted for the preset influencing factor indicators, and the indicators with statistical significance shall be included in the variables of logistic regression analysis. Assign values to the variables entering the Logistic regression equation, and then conduct multi factors Logistic regression analysis; the result is obtained.

2.Results

2.1 Single factor analysis

The results of single factor analysis on 8 clinical indicators that may be related are shown in Table 1 and Table 2.Single factor analysis showed that there were significant differences in albumin, hemoglobin, cholinesterase, blood transfusion, shock index and admission to ICU between the adverse outcome group and the non adverse outcome group (P<0.05).

2.2 Multiple factors analysis

The indexes with statistical significance for single factor analysis were included in logistic regression analysis; The results are shown in Table 3. The regression coefficient test of variable albumin and blood transfusion P value was less than 0.05, and the difference was statistically significant.

Table 1 Single factor analysis of clinical indicators related to adverse outcome group and non adverse outcome group (x ± s)

	Adverse outcome group (n=39)	No adverse outcome group (n=31)	t	p
age	56.62±13.797	50.32±15.028	1.822	0.073
albumin	29.363±3.9107	38.694±4.8962	0.035	＜ 0.001
globulin	26.069±4.6506	27.197±4.5459	0.733	0.312
cholinesterase	4338.33±1368.72	6324.48±1312.13	0.963	0.002
hemoglobin	73.21±19.549	108.32±25.725	0.046	＜ 0.001

Table 2 Single factor analysis of clinical indicators in poor prognosis group and non poor prognosis group (cases,%)

		Adverse outcome group (n=39)	No adverse outcomegroup (n=31)	$\chi 2$	P
Transfusion	Yes	31(79.5)	1（3.2）	40.476	＜0. 001
	No	8(20.5)	30（96.8）		
Admitted to ICU	Yes	20(51.3)	2(6.5)	16.107	＜0. 001
	No	19(48.7)	29(93.5)		
Index of shock	≥1	27(69.2)	6(19.4)	17.242	＜0. 001
	＜1	12(30.8)	25(80.6)		

Table 3 Logistic regression analysis of adverse outcomes in patients with acute non variceal upper gastrointestinal bleeding

	B	S.E.	Wald $\chi 2$	p	Exp(B)	95%CI
albumin	0.589	0.285	4.285	0.038	1.802	1.032-3.149
hemoglobin	-.072	.064	1.237	0.266	1.931	0.821-1.056
cholinesterase	.002	.001	3.176	0.075	1.002	1.000-1.005
Index of shock	-.419	2.212	0.036	0.850	0.657	0.009-50.148
Transfusion	-11.11	5.125	4.700	0.030	1.000	0.003-0.344
Admitted to ICU	-1.358	2.231	0.371	0.543	0.257	0.003-20.364

Discussion

Acute gastrointestinal bleeding is a common acute and severe disease in emergency department. Because of its diverse causes and complex pathogenic factors, it is very easy to have hemorrhagic shock, multiple bleeding and even death risk. Long term follow-up of AUGIB patients

showed that the mortality rate from all causes was nearly 37% three years after admission[4],The prognosis of the elderly and malignant tumors is worse. The influencing factors are detailed as follows.

1.Albumin

a retrospective study found that [5]：The factors that significantly affect rebleeding are transfusion units and albumin levels.Chang A et al.[6]found that:In patients with acute gastrointestinal bleeding, AIMS65 score is the only accurate risk assessment tool, which is used to predict mortality and blood transfusion demand score, but it cannot predict the demand for endoscopic intervention or rebleeding in this population. AIMS65 scoring system includes plasma albumin (<30g/1), international normalized ratio (INR) (>1.5), systolic blood pressure (<90mmHg), mental changes and age (>65 years)[7].These two studies include patients with acute variceal gastrointestinal bleeding. This study is aimed at patients with acute non variceal bleeding. Through logistic multivariate analysis, it is found that albumin has certain predictive significance for predicting adverse outcomes such as rebleeding and death one year later. Albumin is easy to obtain. Of course, AIMS 65 score may be more predictive, which still needs to be confirmed by more research areas.

2.Blood transfusion

Many patients with gastrointestinal bleeding often have hemorrhagic shock or are in the pre shock state. Blood transfusion is an important treatment. In this study, the logistic study found that blood transfusion was a risk factor for adverse outcomes in patients with non variceal gastrointestinal bleeding.A Logistic study found[8]:Fresh frozen plasma transfusion, liver cirrhosis and gastrointestinal tumor are related factors of poor prognosis

of acute upper gastrointestinal hemorrhage. Some scholars believe that[9]Infusion of fresh frozen plasma may increase the circulatory load and metabolism of patients, and increase the risk of sepsis and multiple organ failure.GONG found that [10]The risk of acute lung injury in patients with acute gastrointestinal bleeding treated with fresh frozen plasma transfusions has doubled. In recent years, some studies have also confirmed the value of restrictive blood transfusion strategies[11, 12].This study did not conduct a detailed classification study on the type, quantity and frequency of blood transfusion. However, the proportion of blood transfusion in the group with adverse outcome was significantly higher than that in the group without adverse outcome. Blood transfusion has certain predictive significance for adverse outcomes. This may also indicate that the patient's initial condition is more serious. In short, we should strengthen blood transfusion management.

3.Hemoglobin and cholinesterase

Hemoglobin is the most common abnormal index in patients with acute gastrointestinal hemorrhage. However, during acute blood loss, the hemoglobin concentration will remain unchanged. Therefore, the assessment of active blood loss cannot rely on continuous measurement of hemoglobin. This study concluded that hemoglobin was a predictor of adverse outcomes through single factor analysis. This may indicate that the patients selected in the study group had a large amount of bleeding when they came to the hospital, the hemoglobin level changed significantly, and the condition was serious. Therefore, such patients may often have a poor outcome. For many years, the hemoglobin threshold of red blood cell transfusion has been controversial. A multicenter study found that the restricted transfusion strategy significantly improved the 45 day mortality of patients with acute upper

gastrointestinal bleeding compared with the free transfusion strategy[11].Cholinesterase is a glycoprotein secreted by the liver, which will decrease in critical diseases such as related acute phase[13].The single factor analysis of this study found that the difference of cholinesterase between the adverse outcome group and the non adverse outcome group was statistically significant, and it was a factor influencing the adverse outcome of patients with non variceal upper gastrointestinal bleeding。Sun Rourou et al.[14]suggested that ChE can be used as an important indicator of the condition and prognosis of patients with peptic ulcer. Peptic ulcer is the most common cause of gastrointestinal bleeding. However, there are many influencing factors of ChE, such as inflammation, tumor, malnutrition, etc., which need to be specifically analyzed in combination with clinical conditions.

4.Shock index

Shock index (SI) is a simple parameter, which is calculated by dividing heart rate by systolic blood pressure (SBP). The reference range is 0.5~0.7[15]。 SI is used in clinical practice because it is simple and easy to calculate, but its judgment of mortality and rebleeding rate is limited[16]。 In this study, Single factor analysis showed that there was a statistically significant difference in shock index between the two groups. Shock index can be used as an influencing factor to predict the expected adverse outcome of patients. A multicenter study of 1417 patients with non variceal gastrointestinal bleeding found that high shock index, combined liver failure or liver disease, and high Rockall score were independent risk factors for rebleeding in non variceal upper gastrointestinal bleeding patients[17].Therefore, such patients need to strengthen prevention and treatment.

This study also has some limitations, such as small sample size and short follow-up time; There are few factors involved. Most of the selected indicators are simple clinical indicators, and the classification is not detailed enough. However, there are many factors that affect the adverse outcome of patients with non variceal gastrointestinal bleeding. In addition to paying attention to the above common and easy to obtain indicators, some scoring systems need to be applied, and some prediction models can be established through multifactor analysis to more accurately evaluate the adverse outcome and identify interventions as early as possible.

Conflict of interest statement

None

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None

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