

Observation on the Clinical Effect of Emergency Interventional Therapy on Acute Severe Non-Variceal Upper Gastrointestinal Bleeding

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Abstract: *Objective:* To observe the clinical effect of emergency interventional therapy for patients with acute severe non-variceal upper gastrointestinal bleeding. *Methods:* 78 patients with acute severe non-variceal upper gastrointestinal bleeding who were treated in the General Hospital of the Eastern Theater Command from May 2020 to May 2023 were randomly divided into two groups according to different treatment plans. The study group underwent emergency upper gastrointestinal angiography and interventional embolization therapy, the control group was treated with esomeprazole; the clinical data related to the two groups were compared, including the total effective rate of treatment, blood pressure stabilization time, bleeding control time, etc. *Results:* The effective rate of clinical treatment in the study group was 97.44%, which was higher than that in the control group, which was 79.49% ($P < 0.05$). Both were significantly shorter ($P < 0.05$); the 7 d rebleeding rate and 30 d rebleeding rate of the study group were lower than those of the control group ($P < 0.05$); the 7 d and 30 d mortality rates of the two groups after treatment were compared, and the comparative study group was lower, but there was no significant difference ($P > 0.05$). *Conclusion:* Emergency interventional therapy can control bleeding more quickly, shorten bleeding control time and complete hemostasis time, shorten blood pressure stabilization time and abdominal pain relief time, and reduce rebleeding rate in patients with acute severe non-variceal upper gastrointestinal bleeding.

Keywords: Upper gastrointestinal bleeding; Non-variceal veins; Interventional embolization; Esomeprazole

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1. Introduction

Acute severe non-variceal upper gastrointestinal bleeding is a serious emergency that often endangers the life of the patient ^[1]. In clinical practice, timely and effective treatment is the key to ensuring the safety of patients and improving the therapeutic effect ^[2]. Emergency interventional therapy refers to direct hemostasis or embolization of bleeding lesions through endoscopic or vascular interventional techniques to quickly control bleeding and restore circulatory stability ^[3]. The purpose of this article is to observe and evaluate the clinical

effect of emergency interventional treatment for patients with acute severe non-variceal upper gastrointestinal bleeding. By collecting and analyzing the clinical data of patients, we focus on the success rate of emergency interventional treatment and the time to bleeding control, as well as indicators such as the remission of the patient's condition, to evaluate its impact on the patient's clinical effect and treatment outcome. Through this observational study, we hope to further verify the clinical application value of emergency interventional therapy in acute severe non-variceal upper gastrointestinal bleeding, and provide clinicians with more powerful evidence and guidance to improve acute severe non-variceal upper gastrointestinal bleeding, to improve the treatment effect and survival rate of patients with acute severe non-variceal upper gastrointestinal bleeding.

2. Materials and methods

2.1. General information

A total of 78 patients with acute severe non-variceal upper gastrointestinal bleeding who were treated in our hospital from May 2020 to May 2023 were randomly divided into two groups according to different treatment plans. Among the 39 cases in the research group, there were 21 males and 18 females, aged 22–69 (34.52 ± 2.47) years old, primary diseases: 3 cases of upper gastrointestinal tumors, 19 cases of peptic ulcer, and 17 cases of acute gastric mucosal lesions. Among the 39 cases in the control group, there were 22 males and 17 females, aged 21–68 (34.03 ± 2.51) years old, primary diseases: 2 cases of upper gastrointestinal tumors, 18 cases of peptic ulcer, and 19 cases of acute gastric mucosal lesions. Comparing the general information of the two groups of patients, there was no significant difference in data composition ($P > 0.05$), and the studies were comparable.

2.2. Inclusion and exclusion criteria

The inclusion criteria included: (1) After diagnosis, it is consistent with the clinical diagnostic criteria for acute non-variceal upper gastrointestinal bleeding, and it is graded as severe; (2) Patients who have complete clinical data; (3) Patients who have been followed up; (4) Patients who are informed about this study and voluntarily participated.

The exclusion criteria included: (1) Patients with blood system lesions; (2) Patients with mental diseases; (3) Patients with gastrointestinal bleeding due to trauma; (4) Patients with variceal bleeding.

2.3. Methods

After being admitted into the group, the patients in the two groups were treated with the same conventional symptomatic treatment, including strict fasting, blood volume supplementation, somatostatin, fluid replacement, and so on.

For the control group, in addition to the aforementioned conventional symptomatic treatment, esomeprazole sodium (Chia Tai Tianqing Pharmaceutical Group Co., Ltd., National Drug Approval H20163102) intravenous injection was given at the initial dose of 80 mg and then changed to a loading dose of 8 mg/h for continuous infusion.

All patients in the study group had one side of the femoral artery punctured using the Seldinger puncture technique and the vascular sheath was placed into it. Based on the premise of guide wire exchange, the catheter was inserted into the gastroduodenal artery, left gastric artery, and superior mesenteric artery, and an angiographic examination was performed in turn. The imaging equipment used was the Inova 3100 DSA imaging machine produced by GE Company of the United States. Those with normal renal function used iohexol as the contrast agent, and those with abnormal renal function used iodixanol as the contrast agent. Among them, the injection rate of the contrast agent in the superior mesenteric artery is 4 mL/s, the injection

volume is 12 mL, and the pressure is 300 psi; the injection rate of the contrast agent in the left gastric artery and gastroduodenal artery is 3 mL/s, the injection volume is 9 mL, and the pressure is 200 psi. If there are direct signs of hemorrhage with contrast medium overflow after contrast, it is necessary to use micro-coils and/or gelatin sponge particles to embolize the target blood vessels after selective intubation. If the contrast agent is suspected to overflow or there is no obvious sign of contrast agent overflow, embolization of the gastroduodenal artery or left gastric artery will be performed empirically based on the patient's symptoms. Symptomatic treatment with internal medicine was carried out after the operation.

The curative effect was evaluated after 72 hours in both groups.

2.4. Observation of clinical effect

2.4.1. Treatment efficacy

(1) Significantly effective: After the first treatment to stop bleeding, the patient's upper gastrointestinal bleeding problem has completely stopped without recurrence; (2) Effective: After 24-72 hours of treatment, the patient's upper gastrointestinal bleeding problem stopped without recurrence (3) Even after 72 hours of treatment, the patient's bleeding problem has not stopped, or there is still active bleeding. The evaluation of cessation of bleeding is defined as the pulse and blood pressure and other indicators have returned to normal, there is no fresh bleeding lesion in the re-examination endoscopy, and the gastric tube drainage has turned clear ^[4].

2.4.2. Bleeding control time and complete hemostasis time

(1) Bleeding control time: the time taken for the bleeding volume to be reduced by more than 75%; (2) Complete hemostasis time: the time for the bleeding problem to disappear completely ^[5].

2.4.3. Blood pressure stabilization time and abdominal pain relief time

Stable blood pressure means that the blood pressure value remains within a relatively stable range for a period of time, with no obvious fluctuations or small fluctuations; after treatment, if the frequency of abdominal pain attacks is significantly reduced and the duration of each attack is shortened, It is believed that the time for abdominal pain relief has been reached ^[6].

2.4.4. Prognosis

The clinical prognosis of the two groups of patients was recorded and compared. After the first hemostatic treatment, if any of the following situations occur, it can be diagnosed as rebleeding ^[7]: increased frequency of vomiting blood or melena, vomitus from coffee color to bright red, and stool from black dry stool to loose stool or dark red bloody stool with active bowel sounds; the hemoglobin level continues to decrease; even with rapid infusion and blood transfusion, the performance of peripheral circulatory failure has not been significantly improved, or it has improved temporarily and then recovered. It shows a tendency to worsen; in the case of adequate fluid replacement and urine output, the blood urea nitrogen has been or rises again; the aspirated product of the gastric tube contains a large amount of fresh blood. Rebleeding rate = number of rebleeding cases/total number of cases × 100%.

2.5. Statistics

SPSS 26.0 software was used for data statistics and processing, and the measurement data was represented in the form of mean ± standard deviation (SD), and the *t*-test was used; the count data was represented in the form of the number of cases and percentages (%), and the χ^2 test was used. The test result was regarded as *P*, and *P* < 0.05 indicated that the difference between the data was statistically significant.

3. Results

3.1. Comparing the clinical treatment effect of the two groups of patients

Table 1 showed that the effective rate of clinical treatment in the study group was 97.44%, which was higher than that in the control group, which was 79.49% ($P < 0.05$).

Table 1. Comparison of the clinical treatment effects of the two groups of patients [n (%)]

Group	Number of cases	Markedly effective	Effective	Ineffective	Total treatment efficiency
Study group	39	22 (56.41)	16 (41.03)	1 (2.56)	38 (97.44)
Control group	39	13 (33.33)	18 (46.15)	8 (20.51)	31 (79.49)
χ^2					6.155
P					< 0.05

3.2. Bleeding control time and complete hemostasis time

Compared with the control group, the bleeding control time and complete hemostasis time of the study group were significantly shorter ($P < 0.05$), see **Table 2**.

Table 2. Comparison of bleeding control time and complete hemostasis time between the two groups (mean \pm SD, h)

Group	Bleeding control time	Complete hemostasis time
Study group	16.52 \pm 1.43	24.25 \pm 3.17
Control group	22.51 \pm 2.67	33.64 \pm 4.12
t	12.350	11.281
P	< 0.05	< 0.05

3.3. Blood pressure stabilization time and abdominal pain relief time

Compared with the control group, the blood pressure stabilization time and abdominal pain relief time of the study group were shorter ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of blood pressure stabilization time and abdominal pain relief time difference between the two groups (mean \pm SD)

Group	Blood pressure stabilization time (h)	Abdominal pain relief time (d)
Study group	7.21 \pm 1.45	1.51 \pm 0.26
Control group	11.22 \pm 2.04	2.41 \pm 0.33
t	10.006	13.378
P	< 0.05	< 0.05

3.4. Clinical prognosis

The 7 d and 30 d rebleeding rates of the study group were lower than those of the control group ($P < 0.05$); the 7 d and 30 d mortality rates of the two groups were lower than those of the study group, but there was no significant difference ($P > 0.05$). See **Table 4**.

Table 4. Comparison of clinical prognosis between the two groups [*n* (%)]

Group	Number of cases	7 d after treatment		30 d after treatment	
		Rebleeding rate	Case fatality rate	Rebleeding rate	Case fatality rate
Study group	39	8 (20.51)	2 (5.13)	11 (28.21)	3 (7.69)
Control group	39	16 (41.03)	6 (20.51)	25 (64.10)	8 (25.64)
χ^2		4.183	2.229	10.111	2.646
<i>P</i>		< 0.05	> 0.05	< 0.05	> 0.05

4. Discussion

Acute severe non-variceal upper gastrointestinal bleeding is a serious digestive system disease, commonly seen in ruptured esophageal varices, ruptured gastric varices, etc.^[8]. The main feature of the disease is massive upper gastrointestinal bleeding. Clinical manifestations include hematemesis, melena, blood pressure drop, and heart rate increase. Severe bleeding can lead to anemia, shock, and life-threatening^[9]. Its treatment is an urgent and complicated process. Traditional treatment methods include endoscopic hemostasis, drug therapy, and surgical means. However, these methods are not always able to quickly control bleeding, especially for patients with severe bleeding, the time is very short and critical^[10,11].

As an emerging treatment method, emergency interventional embolization is of great significance. Through interventional angiography, embolization is directly performed at the bleeding point to block the bleeding vessels, thereby effectively controlling the bleeding^[12]. Compared with traditional treatment methods, emergency interventional therapy can quickly control bleeding in a short period of time, shorten the time of bleeding control and complete hemostasis, reduce the risk of bleeding in patients, and at the same time effectively block bleeding vessels, reduce the risk of rebleeding, and improve the success rate of treatment^[13-15].

This study results show that the bleeding control time and complete hemostasis time of the study group patients are significantly shorter than those of the control group, which indicates that emergency interventional treatment can control bleeding more quickly and achieve the effect of complete hemostasis. At the same time, the rebleeding rate of the study group was lower than that of the control group at 7 days and 30 days after treatment, which may be because the emergency interventional treatment in the study group can control bleeding more effectively and reduce the risk of rebleeding, but for patients with serious conditions, the case fatality rate may be affected by other factors, so there is no significant difference.

In summary, emergency interventional therapy can control bleeding more quickly, shorten the time for bleeding control and complete hemostasis, shorten the time for blood pressure stabilization and abdominal pain relief, and reduce the rebleeding rate.

Disclosure statement

The authors declare no conflicts of interest.

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