ORIGINAL RESEARCH

The Clinical Effect of Octreotide Combined with Upper Endoscopy in the Treatment of Peptic Ulcer Complicated with Upper Gastrointestinal Hemorrhage

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ABSTRACT

Background • With the development of endoscopic technology, the application of upper endoscopy can quickly target the lesion site of patients with peptic ulcer complicated with upper gastrointestinal bleeding.

Objectives: This study aims to discuss the clinical effect of octreotide combined with upper endoscopy in treating peptic ulcer complicated with upper gastrointestinal hemorrhage.

Methods • A total of 82 patients diagnosed with peptic ulcer complicated with upper gastrointestinal hemorrhage were recruited as study objects in the researchers' hospital. According to the treatment method, this retrospective study divided the patients into a control group (n=41, receiving adrenaline injection under upper endoscopy only) and a treatment group (n=41, receiving adrenaline injection under upper endoscopy and Octreotide intravenously).

Results • After treatment, the volume of blood loss, average hemostasis time, hospital stay, and time of occult blood turning negative in the treatment group were shorter than those in the control group ($P < .05$). After treatment, the clinical efficacy of the treatment group was better than that of the control group ($P < .05$). The levels of prothrombin time (PT), activated partial thromboplastin time (APTT), and thrombin time (TT) levels in the treatment group were lower than those in the control group, with significant differences ($P < .05$).

Conclusion and Relevance • Combining octreotide and upper endoscopy has affirmative efficacy and good hemostatic effect on treating peptic ulcer complicated with upper gastrointestinal hemorrhage with less pain and short recovery time, which is worthy of clinical application. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Peptic ulcer is a common digestive disease worldwide, primarily affecting the stomach and duodenum. The most severe and frequent complication is upper gastrointestinal bleeding, with an incidence of 20%-25%.[1] Under normal circumstances, the mucosa of the digestive system possesses repair and defense capabilities. For example, abundant blood flow allows for the renewal of epithelial cells, prostaglandins, and the muco-bicarbonate barrier, effectively preventing erosion by harmful factors. If the protective factors weaken and the erosive factors strengthen, the digestive tract may suffer from mucosal necrosis and shedding and ultimately develop ulcers. Digestive tract ulcers are a common contributor to the development of peptic ulcers complicated with upper digestive tract bleeding. The causes and mechanisms of these ulcers are diverse, including factors such as lifestyle, environment, mental state, infections, medications, gastric acid, non-steroidal anti-inflammatory drugs, pepsin, and Helicobacter pylori (HP).

Numerous theories suggest that when susceptible individuals experience certain factors, their lymphocytes and macrophages become active. This activation leads to the release of inflammatory mediators and cytokines, activating specific signaling pathways. The result is a hyperactive immune response in the gastrointestinal mucosa, leading to symptoms such as abdominal pain, melena, hematemesis, anemia, and morbidity.[2] While a small amount of hemorrhage can be restricted, the disease progresses rapidly when there is active bleeding or bleeding > 1000 ml in a short period. Without timely and effective treatment, this can even lead to circulatory system failure, confusion, and a threat to the patient's life.[3]

In recent years, the prevalence of peptic ulcers has been increasing due to changes in people's lifestyles and dietary

habits. This has had a severe impact on the lives and health of patients. Fortunately, advances in endoscopic technology have allowed for quick identification and targeting of the lesion site in patients with peptic ulcers complicated by upper gastrointestinal bleeding. However, while this technology provides temporary relief, it does not offer a permanent solution, leading to a high recurrence rate.[4]

Octreotide, a synthetic derivative of natural somatostatin, is a peptide that integrates well with the bloodstream. Its pharmacological properties are similar to somatostatin but with a longer duration of action. This allows it to regulate bodily functions effectively and promote healing while preventing rebleeding.[5] A study by Gu et al.[6] highlighted the accuracy and hemostatic efficacy of using octreotide in combination with upper gastrointestinal endoscopy bleeding, suggesting its suitability for clinical use. Similarly, Yang et al.[7] pointed out that combining octreotide and upper gastrointestinal endoscopy can accelerate hemostasis and avoid rebleeding in patients with peptic ulcer complicated with upper digestive tract bleeding., substantiating its efficacy and pharmaceutical value. This study aims to assess the clinical effect of octreotide combined with upper endoscopy in the treatment of patients with peptic ulcers complicated with upper gastrointestinal hemorrhage.

METHODS

Patients

In this retrospective study, 82 patients with peptic ulcer complicated with upper gastrointestinal bleeding were admitted to the researchers' hospital from April 2019 to December 2021. They were consecutively selected as research subjects. These patients had peptic ulcers that were complicated by upper gastrointestinal bleeding. The researchers divided the patients into 2 groups based on their treatment: the treatment group and the control group, with 41 cases in each group. Because this study was retrospective, the need for informed consent was waived. The study protocol complied with the relevant guidelines of the World Medical Association Declaration of Helsinki and was approved by the Ethics Committee of the researchers' hospital.

Inclusion and Exclusion Criteria

All patients were admitted to the study because they presented symptoms of hematemesis and hematochezia. The combination of endoscopy findings, clinical symptoms, and auxiliary examination met the clinical diagnostic criteria for peptic ulcer complicated with gastrointestinal bleeding.[8-9]

Patients were excluded as subjects for the study based on various criteria. Specifically, patients who had (1) other digestive diseases; (2) cardiovascular, liver, lung, or kidney diseases; (3) cancerous ulcer or ulcer cancerization; (4) severe liver, kidney, heart dysfunction or other malignant tumors; (5) application of glucocorticoids or non-steroidal drugs; (6) portal hypertension caused by venous esophageal and gastric varices rupture bleeding; (7) mental disorders; (8) pregnancy or lactation; (9) coagulopathy; or (10) anaphylaxis to the drugs used in this study.

Treatment

The control group patients received epinephrine injections during gastroscope treatment. After supine and combined lumbar and epidural anesthesia, the patients were placed into a gastroscope (CV-150, Olympus Company, Japan). To prepare the gastric lavage solution, 1mg of adrenaline hydrochloride (Harbin Medicine Sanchine Pharmaceutical Co., LTD., No. 19071231, 1mL) was added to 1000ml of normal saline. The gastric lavage was then performed with the flushing solution and aspirated secretions. Afterward, the specific site of bleeding and the ulcer were identified and located using upper endoscopy. Endoscopic forceps were inserted to target the lesion for compression, disconnection, and hemostasis. If bleeding is excessive, a hemostatic agent should be applied to the affected area.

The treatment group underwent a procedure using a combination of octreotide combined with epinephrine, which was administered during an upper endoscopy. The decision to administer this treatment was based on the Forrest score,[10] with patient in grade* among which grade Ib, IIa, and IIb were given octreotide receiving octreotide combined with epinephrine injection via a gastroscopy was the same as that used in the control group. After gastroscopic treatment (similar to the control group), the patients received a mixture of 0.1mg of octreotide (Novartis Pharma Schweiz AG; NO. S0375; 1mL/0.1mg) and 40mL normal saline, administered intravenously at a rate of 0.025 mg/h using a micropump. The infusion was completed over 8 hours, and the drug was administered continuously for 5 days. Intravenous infusion of PPI (Pantoprazole 40mg+0.9% sodium chloride injection 100ml, twice a day) was given to grade *c and *. The subjects of this study were grade Ib,* IIA, and IIB.

Observation Indicator

The study recorded various parameters, including blood loss, average time for hemostasis, duration of hospital stay, time taken for occult blood to turn negative, and the rebleeding rate.

Clinical efficacy[9]: A noteworthy effect was that cessation of bleeding occurred within 48 hours of treatment, with no ongoing active bleeding. Deemed effective: the active bleeding stopped within 2-4 d after treatment. Deemed ineffective: 5 days after treatment, active bleeding persisted, and there was a continued decrease in hemoglobin levels. Overall effectiveness was determined by combining both significant and general efficacy. Total efficiency = significant efficiency + efficiency.

The requirements for the cessation of bleeding satisfied the following criteria:[9] (1) cessation of hematemesis and melena; (2) stable vital signs; pulse pressure difference > 30mmHg, systolic blood pressure > 90mmHg, and heart rate < 100 bpm; (3) steady levels of hemoglobin and hematocrit or a negative result in fecal occult blood turns; and (4) absence of active bleeding during the upper endoscopy procedure.

Rebleeding rate: Clinical symptoms such as melena and hematemesis recurred following the treatment.

The incidence of switching to other treatments is the percentage of patients who underwent endoscopic or surgical treatment due to rebleeding.

Pain degree: The pain level was evaluated using the Visual Analogue Scale (VAS)[11] before and 72 hours after treatment. The scale ranged from 0 to 10, with higher scores indicating more severe pain.

Coagulation: Changes in coagulation indicators, including prothrombin time (PT), activated partial thromboplastin time (APTT), and thrombin time (TT), were assessed using a coagulation analyzer (CA7000 coagulation analyzer Sysmex, Japan) and relevant reagents before and 72 hours after treatment.

Adverse reactions: Anemia, headaches, palpitations, and other adverse reactions during the treatment were recorded.

Statistical Analysis

All statistical analyses were performed using SPSS 21.0 (SPSS, Chicago, IL, USA). The Kolmogorov–Smirnov test assessed the normal distribution of continuous variables. Continuous variables that met the criteria for normal distribution were expressed by mean and standard deviation. Categorical variables were presented as percentages. To compare between groups, the Student's t-test was used for continuous variables, while the Chi-squared test was utilized for categorical data. Significance was defined as a $P < .05$.

RESULTS

Comparison of General Information

The treatment group consisted of 22 males and 19 females, with an average age of (52.18±11.98) years (range, 23-79 years). Similarly, the control group included 23 males and 18 females, with an average age of (52.01±11.04) years (range, 23-77 years). There were no significant differences in gender ($P = .824$), age ($P = .948$), bleeding time ($P = .382$), and other general data between the 2 groups (all $P > .05$), as shown in Table 1.

Comparison of Clinical Efficacy

After treatment, the clinical efficacy of the treatment group (97.56%) surpassed that of the control group (82.93%), with a significant difference ($P = .026$), as shown in Table 2. The endoscopic images illustrating the patients' recovery before and after treatment can be seen in Figure 1.

Comparison of Blood Loss, Average Hemostatic Time, Hospital Stay and Time of Occult Blood Turning Negative

Compared to the control group, the treatment group experienced less blood loss, shorter hemostasis time, reduced hospital stay, and faster reversal of occult blood after treatment. These differences were significant (all $P < .05$), as shown in Table 3.

Table 1. Comparison of General Information Between 2 Groups

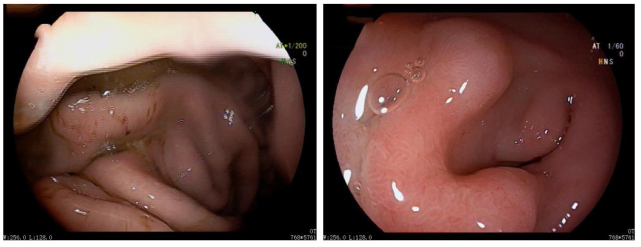
	Treatment group (n=41)	Control group (n=41)	t/χ^2	*P* value
Gender (male/female)	22/19	23/18	0.049	.824[b]
Age (year)	52.18±11.98	52.01±11.04	0.066	.948[a]
Bleeding time (day)	2.18±0.32	2.12±0.29	0.879	.382[a]
Position of ulcer (n)			1.148	.563[b]
Gastric ulcer	20	18		
Duodenal ulcer	14	12		
Compound ulcer	7	11		
Smoking (n)	17	18	0.051	.823[b]
Alcohol (n)	13	11	0.236	.627[b]
Complication (n)			0.354	.950[b]
Diabetes	9	10		
Coronary heart disease	11	10		
Stroke	13	10		
Shape of ulcer (n)			0.576	.448[b]
Class circle	32	29		
Irregular type	9	12		
Number of ulcer (n)			0.195	0.659[b]
Single	20	22		
Multiple	21	19		
Diameter of ulcer (cm)	2.03±0.23	2.01±0.19	0.424	0.673[a]
Stage of ulcer (n)			2.821	0.093[b]
Active stage	25	32		
Non-active stage	16	9		
Forrest score (score)			0.602	.740
Class I b	13	15		
Class II a	16	17		
Class IIb	19	9		
Use Esomeprazole sodium	12	10	0.248	.618
History of anticoagulant Drug use	8	7	0.082	.775

compared by Student's *t* test
* compared by Chi-square test

Table 2. Comparison of Clinical Efficacy Between 2 groups

	Treatment group (n=41)	Control group (n=41)	χ^2	*P* value
Significant effective (n)	21	13		
Effective (n)	19	21		
Ineffective (n)	1	7		
Effective rate (n,%)	40 (97.56)	34 (82.93)	4.986	.026

Figure 1. A male patient, 62 years old. Comparison of gastroscopic manifestations of octreotide combined with upper endoscopy before and after treatment of duodenal bulbar ulcer (A. before treatment; B. after treatment).



A B

Table 3. Comparison of Bleeding Between the 2 Groups

	Treatment group (n=41)	Control group (n=41)	χ^2	*P* value
Blood loss (mL)	421.07±19.22	456.82±17.67	-8.768	<.001[a]
Average hemostatic time (day)	20.07±2.87	25.54±2.91	-8.571	<.001[a]
Hospital stay (day)	6.03±1.28	7.18±1.32	-4.005	<.001[a]
Time of occult blood turning negative (day)	4.12±0.76	5.37±0.81	-7.206	<.001[a]
Rebleeding rate (n,%)	1(2.44)	8(19.51)	6.116	.013[b]
Rate of changing treatment (%)	1(2.44)	9(21.95)	7.289	.007[b]

[a]compared by Student's *t* test
[b]compared by Chi-square test

Table 4. Comparison of Pain Degree Between the Two Groups

	Treatment group (n=41)	Control group (n=41)	*t*	*P* value
Before treatment	5.23±1.28	5.19±1.21	0.145	.885
72 hours after treatment	0.78±0.27	1.26±0.29	7.757	<.001

Table 5. The Comparison of Coagulation Function Between 2 Groups

	Treatment group (n=41)	Control group (n=41)	*t*	*P* value
PT (s)				
Before treatment	13.76±2.78	13.64±2.86	0.193	.847
After treatment	8.72±2.91	11.05±2.45	-3.922	<.001
APTT (s)				
Before treatment	33.17±2.36	33.08±2.43	0.172	.865
After treatment	22.01±2.34	26.87±2.43	-9.225	<.001
TT (s)				
Before treatment	19.65±2.87	19.45±2.91	0.313	.755
After treatment	10.76±2.91	16.28±2.83	-8.707	<.001

Abbreviations: PT, prothrombin time; APTT, activated partial thromboplastin time; TT, thrombin time.

Table 6. The Comparison of Adverse Reactions Between the 2 Groups

	Treatment group (n=41)	Control group (n=41)	χ^2	*P* value
Adverse reaction			0.823	.364
Anemia	1	1		
Headache	2	3		
Palpitation	2	4		

Comparison of Pain Degree Between the 2 Groups

There was no significant difference in pain levels between the 2 groups before treatment ($P > .05$). However, after treatment, the treatment group exhibited lower pain levels (0.78±0.27) compared to the control group (1.26±0.29) ($P < .001$), as shown in Table 4.

Comparison of Coagulation Function Between 2 Groups

Before treatment, there was no significant difference in PT, APTT, and TT levels between the 2 groups (all $P > .05$). However, following treatment, the treatment group displayed shorter PT, APTT, and TT levels than the control group, with statistically significant differences (all $P < .001$), as shown in Table 5.

Comparison of Adverse Reactions Between the 2 Groups

No notable contrast was observed during treatment in adverse reactions, such as anemia, headaches, palpitations, and other adverse reactions, between the 2 study groups ($P = 0.364$), as shown in Table 6.

DISCUSSION

Peptic ulcer complicated with upper gastrointestinal bleeding occurs suddenly and progresses rapidly, leading to uncontrollable bleeding, vomiting blood, hematemesis, and melena. Immediate intervention is necessary.[12] With advancements in medicine, hemorrhagic shock caused by upper gastrointestinal bleeding is no longer the leading cause of poor prognosis. However, the mortality rate of patients with upper gastrointestinal bleeding remains high due to factors such as advanced age and complications.[13] Octreotide is a safe and effective medication for arresting peptic ulcer hemorrhage. It may be used as the first-line treatment for patients experiencing massive peptic ulcer hemorrhage before they reach the hospital.[13]

In this study, the researchers evaluated the clinical efficacy of combining octreotide with upper endoscopy in treating peptic ulcer complicated with upper gastrointestinal hemorrhage. The results showed that this approach positively impacts and effectively controls bleeding in these patients, leading to less pain and shorter recovery times.

The advancement of imaging technology has led to the rapid development of upper endoscopy, which is now considered an essential method for diagnosing and treating digestive diseases. This procedure offers several advantages: simplicity, clear visualization, high accuracy, and efficiency. It can be directly applied to the affected area, making it highly effective in treating lesions. Moreover, gastroscope intervention through local injection to active bleeding can help reduce bleeding by swelling the local mucosal tissue and exerting pressure on surrounding blood vessels to reduce local blood flow.

However, this treatment may not always be effective in preventing rebleeding.[14] When the factors of gastric and duodenal mucosa injury increase and the defense and repair mechanism of the mucosa is insufficient to resist, stomach acid is activated and transferred into pepsin. The gastric acid and pepsin could digest gastric mucosa.[15] On the other hand, when patients are infected with Hp bacteria, it can further increase gastric acid secretion, impairing the function of gastric mucosa repair and accelerating disease progression.[15] When stomach pH < 5.4, platelet aggregation is inhibited, leading to the dissociation of new clots.[16]

Therefore, inhibiting gastric acid secretion and maintaining a high gastric pH is crucial in restarting the blood coagulation system and serving a hemostatic role. Combining gastroscope interventional therapy with relevant acid suppression drugs should raise the pH of gastric juice to improve hemostasis function.[16] Octreotide is a compound similar to somatostatin, which acts on patients with peptic ulcers complicated with upper gastrointestinal bleeding. It can enhance the acidic environment at the bleeding site by inhibiting gastric acid and reducing the synthesis and decomposition of gastrin. In addition, it stimulates gastric mucus secretion to enhance mucosal cells' protective mechanism and lessen cells' necrosis at the bleeding site. Furthermore, it selectively contracts visceral blood vessels, effectively decreasing blood flow in visceral arteries without affecting systemic blood flow, accelerating hemostasis, and reducing the risk of rebleeding.[17]

Zhao et al.[17] found that combining octreotide and Esomeprazole sodium effectively treats acute upper gastrointestinal bleeding caused by peptic ulcers. This treatment can improve the coagulation function, reduce inflammatory response, and have a low rate of adverse reactions. Zhang et al.[18] also noted that octreotide combined with pantoprazole alone in elderly patients with peptic ulcer

and upper gastrointestinal bleeding*. The study showed that the combination treatment improved clinical symptoms better than the control group. Xu et al.[19] pointed out that patients with peptic ulcer complicated with upper gastrointestinal bleeding were treated with comprehensive large-dose omeprazole combined with octreotide, which had a good curative effect and shortened the hemostatic time.

As the fifth vital sign, pain has garnered increasing attention from the medical community. Resolving pain-related issues has become a key objective in the field of medicine.[21] The primary indication of gastric ulcer is a burning sensation in the stomach, typically experienced 30 minutes to 1 hour after a meal. The pain can last for several minutes or hours, significantly affecting the quality of life of patients.[22] Xiong et al.[23] conducted a study highlighting the effectiveness of combining octreotide with thrombin treatment for patients with upper gastrointestinal bleeding caused by cirrhosis. The results showed that this combination therapy effectively alleviated clinical symptoms and provided relief from pain, demonstrating significant efficacy. The study group exhibited higher clinical effectiveness after treatment than the control group, suggesting that octreotide combined with upper endoscopy can effectively reduce pain levels in patients with peptic ulcers complicated by upper gastrointestinal bleeding, consistent with the results of previous studies.

The coagulation function reflects both the exogenous and endogenous coagulation systems, including anticoagulation and fibrinolytic functions.[24] The prothrombin time (PT) is a commonly used screening test for detecting exogenous coagulation factors in the coagulation system and is also used for screening for disseminated intravascular coagulation.[24] The APTT indicates the accessibility of the exogenous coagulation system. TT detection primarily reflects abnormal anticoagulation function in the process of fibrinogen conversion into fibrin in the common coagulation pathway, and it can also be used as a screening test for fibrinolytic activity.[24] Peptic ulcer combined with upper gastrointestinal bleeding damages endothelial cells in the vascular wall, activating the body's internal and external coagulation system. This leads to the production of thrombin and fibrin, increasing levels of PT, APTT, TT, and other coagulation factors.[25]

According to Wang et al.,[26] their study found that the combination of octreotide and pantoprazole is highly effective in rapidly improving coagulation function, reducing inflammation, and minimizing severe adverse reactions. The study's results showed that the treatment group's PT, APTT, and TT levels were lower than those in the control group after treatment. This suggests that combining octreotide and upper endoscopy can effectively improve the coagulation function of patients with peptic ulcers complicated with upper gastrointestinal bleeding and facilitate their recovery. Additionally, the study observed adverse reactions, comparing them between the 2 groups. The findings indicated that using octreotide with upper endoscopy does not increase adverse reactions in patients with peptic ulcers complicated by upper gastrointestinal bleeding, thereby highlighting its high safety profile.

Limitations

This study has a few limitations that should be noted. Firstly, the follow-up time was relatively short, which may have limited the understanding of octreotide's effect and side effects. Secondly, the study's sample size was small as it only included patients from a single medical center. Finally, detailed medication information and other clinical data from the patients were lacking because this was a retrospective study. Therefore, it is recommended that future research includes a more rigorous multi-center randomized controlled trial that incorporates basic research to validate the findings of this study.

CONCLUSION AND RELEVANCE

This study found that using octreotide in combination with gastroscopy therapy was significantly effective in achieving homeostasis for upper gastrointestinal bleeding caused by peptic ulcer disease. These findings suggest that the clinical application of octreotide in these cases is warranted.

AUTHOR CONTRIBUTIONS

Di Zhou and Peiyu Zhao contributed equally to this paper and were co-first authors.

REFERENCES

1. Kamada T, Satoh K, Itoh T, et al. Evidence-based clinical practice guidelines for peptic ulcer disease 2020. *J Gastroenterol*. 2021;56(4):303-322. doi:10.1007/s00535-021-01769-0
2. Tarasconi A, Coccolini F, Biffl WL, et al. Perforated and bleeding peptic ulcer: WSES guidelines. *World J Emerg Surg*. 2020;15(3):3. doi:10.1186/s13017-019-0283-9
3. Wang A, Yerxa J, Agarwal S, et al. Surgical management of peptic ulcer disease. *Curr Probl Surg*. 2020;57(2):100728. doi:10.1016/j.cpsurg.2019.100728
4. Laine L, Barkun AN, Saltzman JR, Martel M, Leontiadis GI. ACG clinical guideline: upper gastrointestinal and ulcer bleeding. *Am J Gastroenterol*. 2021;116(5):899-917. doi:10.14309/ajg.0000000000001245
5. Jiang H, Yang Y, Li J. Effect of octreotide combined with omeprazole on coagulation index and hemostatic efficiency of children with upper gastrointestinal bleeding. *Chinese Journal of Thrombosis and Hemostasis*. 2022;28(03):807-808. doi:10.3969/j.issn.1009-6213.2022.03.206
6. Gu J. Discussion on the clinical effect of octreotide combined with gastroscopy in the treatment of peptic ulcer complicated with upper gastrointestinal hemorrhage. *China Prac Med*. 2021;16(24):134-136. doi:10.14163/j.cnki.11-5547/r.2021.24.046
7. Yang X. Efficacy analysis of intralesional drug injection under gastroscope in treating peptic ulcer complicated with acute upper gastrointestinal bleeding. *Zhongguo Xiandai Yaowu Yingyong*. 2022;16(09):118-120. doi:10.14164/j.cnki.cn11-5581/r.2022.09.040
8. Bai Y, Li ZS. Guidelines for the diagnosis and treatment of acute non-variceal upper gastrointestinal bleeding (2015, Nanchang, China). *Jour Digestive Diseases* 2016;17:79-87 [Originally published in Chinese in *Chinese Journal of Digestive Endoscopy*. 2015;32(12):787-793]. doi:10.1111/1751-2980.12319
9. Chen Y. *Practical Internal Medicine*. 2nd ed. People›s Medical Publishing House; 2005.
10. Zhang Z, Yu H, Shen L, Yu J. Prognosis of Forrest classification and Rockall score for severe peptic ulcer bleeding patients. *Journal of Chengdu Medical College*. 2011;6(4):344-346. doi:10.3969/j.issn.1674-2257.2011.04.019
11. Xiao X. Judge of pain evaluation method usually used in clinic. *Mod Hosp*. 2005;5(12):32-35. doi:10.3969/j.issn.1671-332X.2005.12.013
12. Mullady DK, Wang AY, Waschke KA. AGA clinical practice update on endoscopic therapies for non-variceal upper gastrointestinal bleeding: expert review. *Gastroenterology*. 2020;159(3):1120-1128. doi:10.1053/j.gastro.2020.05.095
13. Poddar U. Diagnostic and therapeutic approach to upper gastrointestinal bleeding. *Paediatr Int Child Health*. 2019;39(1):18-22. doi:10.1080/20469047.2018.1500226
14. Xu L. Clinical effect analysis of drug injection under gastroscope in treatment of peptic ulcer combined with upper gastrointestinal bleeding. *Chinese and Foreign Medical Research*. 2021;19(11):138-140. doi:10.14033/j.cnki.cfmr.2021.11.051
15. Forgerini M, Urbano G, Nadai TR, Zapata-Cachafeiro M, Kemp R, Mastroianni PC. Epidemiological profile of patients with non-variceal upper gastrointestinal bleeding secondary to peptic disease in a tertiary referral Brazilian hospital. *Arq Gastroenterol*. 2021;58(2):202-209. doi:10.1590/s0004-2803.202100000-36
16. Pinto C, Parra P, Magna J, et al. Hemorragia digestiva alta variceal y no variceal: mortalidad intrahospitalaria y características clínicas en un hospital universitario (2015-2017). [article in Spanish]. *Rev Med Chil*. 2020;148(3):288-294. doi:10.4067/S0034-98872020000300288
17. Zhao L, Wu X, Wu W. Effect of octreotide and Esomeprazole sodium on acute upper gastrointestinal bleeding caused by peptic ulcer. *Zhonghua Linchuang Yishi Zazhi*. 2020;48(03):298-302. doi:10.3969/j.issn.2095-8552.2020.03.014
18. Zhang Q, Zhang Y. Effect of octreotide combined with pantoprazole on peptic ulcer complicated with upper gastrointestinal bleeding. *Chinese Journal of Thrombosis and Hemostasis*. 2020;26(4):646-648. doi:10.3969/j.issn.1009-6213.2020.04.042
19. Xu W. Clinical analysis of pantoprazole and octreotide in treatment of upper gastrointestinal hemorrhage. *J Clin Med*. 2018;5(93):102. doi:10.3877/j.issn.2095-8242.2018.93.081
20. Xu G, He Q, Lin L. Exploration of effect of omeprazole combined with octreotide of patients with peptic ulcer and upper gastrointestinal hemorrhage. *Contemporary Medicine*. 2020;26(16):181-182. doi:10.3969/j.issn.1009-4393.2020.16.079

21. Khodadad B, Letafatkar A, Hadadnezhad M, Shojaedin S. Comparing the effectiveness of cognitive functional treatment and lumbar stabilization treatment on pain and movement control in patients with low back pain. *Sports Health*. 2020;12(3):289-295. doi:10.1177/1941738119886854
22. Hu P, Jiang X. Efficacy and side effects of clarithromycin triple therapy on eradication of helicobacter pylori (HP) and pain relief in patients with peptic ulcer. *Guizhou Medicine*, 2022;46(5):716-717. doi:10.3969/j.issn.1000-744X. 2022.05.020
23. Xiong Y, Hu C. Efficacy of octreotide combined with thrombin in the treatment of patients with cirrhosis and upper gastrointestinal hemorrhage. *Journal of Clinical Medicine in Practice*. 2018;22(22):98-99,102. doi:10.7619/jcmp.201822032
24. Zhao W, Li H, Li W, et al. Effect of microwave ablation on platelet and coagulation function in patients with BCLC-A hepatocellular carcinoma. *J Cancer Res Ther*. 2021;17(5):1275-1280. doi:10.4103/jcrt.JCRT_448_19
25. Lv S, Wang L. Application of seamless nursing in children with peptic ulcer combined with upper gastrointestinal bleeding and its influence on blood coagulation function. *Chinese Journal of Thrombosis and Hemostasis*. 2022;28(3):864-865. doi:10.3969/j.issn.1009-6213.2022.03.233
26. Wang C, Wang P, Wu X. Effect of octreotide combined with Pantoprazole in the treatment of senile peptic ulcer complicated with upper gastrointestinal bleeding. *Guizhou Medical Journal*. 2022;46(4):549-551. doi:10.3969/j.issn.1000-744X. 2022.04.022