

Clinical Effect of Omeprazole Combined with Amoxicillin in the Treatment of Gastric Ulcer

Yifei Liu*

People's Hospital of Gaoxin Weifang, Weifang 261000, Shandong Province, China

*Corresponding author: Yifei Liu, 18363606095@163.com

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Abstract: *Objective:* To investigate the therapeutic effect of omeprazole + amoxicillin in patients with gastric ulcers. *Methods:* 62 cases of patients with gastric ulcers who were treated from January 2022 to December 2022 were recruited and randomly divided into groups. Omeprazole + amoxicillin treatment was included in the study group, and amoxicillin treatment was included in the control group. The score of gastric ulcer symptoms, time of symptom resolution, gastrointestinal hormone index, and adverse reactions were compared. *Results:* The gastric ulcer symptom scores in the study group were lower than those in the control group ($P < 0.05$); the gastric ulcer symptoms and *Helicobacter pylori*-negative time in the study group were shorter than those in the control group ($P < 0.05$); the gastrointestinal hormone indexes in the study group were better than those in the control group ($P < 0.05$); the adverse reaction rate of gastric ulcer in the study group was lower than that in the control group ($P < 0.05$). *Conclusion:* Omeprazole + amoxicillin in the treatment of gastric ulcers can regulate gastrointestinal hormones, relieve gastric ulcer symptoms, and shorten the duration of ulcers, which is highly effective and feasible.

Keywords: Gastric ulcer; Amoxicillin; Omeprazole; Curative effect

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1. Introduction

Gastric ulcers are located in the cardia, gastric antrum, and gastric angle. They are common digestive system lesions. The typical symptom is epigastric pain. As the ulcer progresses, the pain can involve the xiphoid process and sternum. It is mostly distending, dull, or hidden pain. In addition, gastric ulcer needs to be treated as soon as possible, otherwise perforation, bleeding, and other diseases may occur, endangering the life of the patient. Combined with the analysis of clinical practice, gastric ulcer is closely related to *Helicobacter pylori* (Hp) infection, and is also related to living habits, genetics, and high mental stress^[1]. At present, drug regimens are used to treat this disease. The commonly used drugs are amoxicillin and omeprazole, which can inhibit the secretion of gastric acid and promote ulcer healing^[2]. In this paper, 62 patients with gastric ulcers who were treated from January 2022 to December 2022 were recruited to explore the efficacy of omeprazole + amoxicillin.

2. Materials and methods

2.1. General information

A sample of 62 patients with gastric ulcers who were treated from January 2022 to December 2022 were randomly divided into two groups. There was no difference in the baseline data of gastric ulcers in the study group and the control group ($P > 0.05$), as shown in **Table 1**.

Table 1. Data analysis of gastric ulcer

Group	No	Gender		Age (years)		Disease course (month)		Ulcer area (cm ²)	
		Male	Female	Range	Average	Range	Average	Range	Average
Study group	31	18 (58.06)	13 (41.94)	23–79	51.62 ± 3.63	1–10	8.53 ± 1.25	1.0–3.0	1.52 ± 0.25
Control group	31	19 (61.29)	12 (38.71)	23–80	51.64 ± 3.79	2–11	8.57 ± 1.27	1.5–3.0	1.53 ± 0.27
χ^2 / t	-	0.0670		0.0212		0.1250		0.1513	
P	-	0.7957		0.9831		0.9010		0.8802	

2.2. Inclusion and exclusion criteria

The inclusion criteria included patients with endoscopically indicated gastric ulcers, patients with normal coagulation index, patients with informed consent, and patients with symptoms such as black stool, belching, and acid reflux.

The exclusion criteria included patients with abnormal organ function, patients with thrombotic or hemorrhagic lesions, and patients with a history of amoxicillin or omeprazole allergy.

2.3. Treatment methods

After the patients with gastric ulcers were enrolled in the group, they fasted irritating food, supplemented with vitamin C, and were instructed to complete an endoscopic examination.

The control group was treated with amoxicillin (Southwest Pharmaceutical Co., Ltd.), administered orally 30 minutes before meals, at a dose of 500 mg, twice a day. Administration for 3 weeks.

The study group was treated with amoxicillin (same dose as the control group) as well as omeprazole (Yantai Luyin Pharmaceutical Co., Ltd.), orally administered 30 minutes before meals, at a dose of 20 mg, twice a day. Administration for 3 weeks.

2.4. Observation indicators

The observation indicators in this study were as follows:

- (1) Symptom score: record acid reflux, abdominal pain, belching, burning sensation, and other symptom scores, 0 points = no symptoms, 3 points = severe symptoms of gastric ulcer.
- (2) Symptom resolution time: record heartburn, epigastric pain, acid regurgitation, fullness resolution time, and Hp negative time.
- (3) Gastrointestinal hormone indicators: detect motilin, gastrin, cholecystokinin, and other indicators.
- (4) Adverse reactions: record diarrhea, abdominal pain, and vomiting.

2.5. Statistical research

The data of gastric ulcer patients were processed with SPSS 21.0, % recorded (χ^2 verification) gastric ulcer count data, mean ± standard deviation (SD) recorded (t verification) gastric ulcer measurement data. There is a statistical difference when $P < 0.05$.

3. Results

3.1. Gastric ulcer symptom score

After medication, the symptom scores of patients with gastric ulcers in the study group were lower than those in the control group ($P < 0.05$); before medication, the symptom scores of patients with gastric ulcers in both groups were not comparable ($P > 0.05$), as shown in **Table 2**.

Table 2. Comparison of gastric ulcer symptom scores before and after medication (mean \pm SD)

Group	Acid reflux (points)		Abdominal pain (points)		Belching (points)		Burning sensation (points)	
	Before	After	Before	After	Before	After	Before	After
Study group (n = 31)	2.42 \pm 0.89	0.78 \pm 0.36	2.42 \pm 0.78	0.74 \pm 0.33	2.28 \pm 0.74	0.81 \pm 0.37	2.44 \pm 0.68	0.79 \pm 0.33
Control group (n = 31)	2.39 \pm 0.91	1.36 \pm 0.44	2.44 \pm 0.76	1.41 \pm 0.42	2.26 \pm 0.72	1.43 \pm 0.45	2.46 \pm 0.69	1.36 \pm 0.52
<i>t</i>	0.1312	5.6803	0.1023	6.9840	0.1079	5.9254	0.1149	5.1530
<i>P</i>	0.8960	0.0000	0.9189	0.0000	0.9145	0.0000	0.9089	0.0000

3.2. Time for gastric ulcer symptoms to subside and time for Hp to turn negative

Table 3 showed that the symptom disappearance time and Hp negative time of gastric ulcer patients in the study group were shorter than the control group ($P < 0.05$).

Table 3. Analysis table of gastric ulcer symptoms turning negative time (d, mean \pm SD)

Group	Heartburn	Epigastric pain	Acid reflux	Fullness	Hp negative time
Study group (n = 31)	4.51 \pm 0.45	4.62 \pm 0.47	5.19 \pm 0.57	3.01 \pm 0.25	6.01 \pm 0.87
Control group (n = 31)	6.24 \pm 0.61	6.25 \pm 0.63	7.52 \pm 0.61	5.61 \pm 0.33	8.72 \pm 0.99
<i>t</i>	12.7070	11.5463	15.5389	34.9662	11.4485
<i>P</i>	0.0000	0.0000	0.0000	0.0000	0.0000

3.3. Gastrointestinal hormone indicators

After medication, the gastrointestinal hormone indexes in the study group were better than those in the control group ($P < 0.05$); before medication, the gastrointestinal hormone indexes in both groups were incomparable ($P > 0.05$), as shown in **Table 4**.

Table 4. Comparison of gastrointestinal hormone indexes before and after medication (mean \pm SD)

Group	Gastrin (ng/L)		Motilin (ng/L)		Cholecystokinin (ng/L)	
	Before	After	Before	After	Before	After
Study group (n = 31)	102.52 \pm 2.48	70.48 \pm 1.63	168.42 \pm 4.15	236.11 \pm 6.85	18.54 \pm 2.95	12.18 \pm 1.36
Control group (n = 31)	102.49 \pm 2.51	80.11 \pm 1.79	168.39 \pm 4.17	215.43 \pm 5.79	18.53 \pm 2.93	16.24 \pm 1.79
<i>t</i>	0.0473	22.1473	0.0284	12.8374	0.0134	10.0555
<i>P</i>	0.9624	0.0000	0.9774	0.0000	0.9894	0.0000

3.4. Adverse reactions of gastric ulcers

Table 5 showed that the adverse reaction rate of gastric ulcers in the study group was 3.23%, which was lower than that in the control group (19.35%, $P < 0.05$).

Table 5. Analysis table of gastric ulcer adverse reactions [n (%)]

Group	Diarrhea	Stomach ache	Vomiting	Incidence rate
Study group ($n = 31$)	0 (0.00)	1 (3.23)	0 (0.00)	3.23
Control group ($n = 31$)	2 (6.45)	3 (9.68)	1 (3.23)	19.35
χ^2	-	-	-	5.2323
P	-	-	-	< 0.05

4. Discussion

Gastric ulcers are located on the inner wall of the stomach and account for a relatively high proportion of digestive system diseases. When the human body is in a healthy physiological state, the gastric mucosa has the function of protecting the inner wall of the stomach, but under the influence of various factors, the mucosa is damaged, which can increase the risk of ulcers that is related to continuous application of non-steroidal anti-inflammatory drugs and Hp infection. In addition, under the influence of gastric acid and pepsin, etc., the risk of ulcers can also be increased, so some scholars put forward the theory of “no acid, no ulcers”. Combined with the analysis of clinical practice, after the occurrence of gastric ulcers, the typical symptoms are low appetite, stomach pain, bloating, etc., and the body weight gradually decreases, and the ulcer area is positively correlated with the severity of the disease. However, some gastric ulcer patients do not have the aforementioned symptoms, and the first symptom is non-occurrence and scattered holes, resulting in an increased misdiagnosis rate of gastric ulcer [3].

After the occurrence of gastric ulcer, it needs to be treated as soon as possible, otherwise, it may cause the following symptoms: (1) Secondary upper gastrointestinal bleeding: after the occurrence of such diseases, no special intervention is required for patients with gastric ulcer, and the bleeding focus can heal itself. In addition, after a gastric ulcer lasts for 1–2 years, secondary gastric bleeding may occur; (2) Secondary gastric perforation: especially for those over 50 years old with an ulcer, the risk of secondary gastric perforation is higher; (3) Secondary pyloric obstruction: it is related to the continuous inflammatory infiltration in the ulcer area. The typical symptoms after the onset are edema, congestion, and pyloric spasm. Internal medicine is the first choice. In addition, if gastric mucosal fibrosis or organic obstruction is secondary, the typical symptom is pyloric stenosis, and surgical treatment is the first choice; (4) Canceration: the risk rate of canceration by continuous stimulation of ulcers has not yet been clarified clinically, but some scholars believe that the risk of secondary gastric cancer in patients with gastric ulcers is about 1%–7%, and the cancer focus is on the edge of the ulcer, so gastric ulcers should be treated with drugs as soon as possible [4].

Gastric ulcers are mostly treated with drugs, and amoxicillin is commonly used, which belongs to broad-spectrum antibacterial drugs and has a good sterilization effect. It can clear Hp, reduce ulcer symptoms and shorten ulcer healing time [5]. In addition, amoxicillin has a short half-life, the active ingredients can exert a sterilizing effect in a short time, and the metabolism can be completely completed after 4–5 half-lives of drug withdrawal; oral administration of amoxicillin can increase the absorption rate of the active ingredients, it can also reduce the influence of acidic environment on drug efficacy. Relevant literature reports that amoxicillin can not completely eliminate Hp in the treatment of gastric ulcers, and the efficacy of the drug is limited [6].

Therefore, some scholars suggest that proton pump inhibitors be given on the basis of amoxicillin. In this paper, omeprazole is used for treatment, which has the characteristics of weak alkalinity and fat solubility. After entering the human body, the active ingredient can be gathered in an acidic environment, and after oral administration, it can be distributed in the gastric secretion tubule in a short period of time, and can continuously and steadily inhibit the secretion of gastric acid. It is also reported in the literature that omeprazole is suitable for the treatment of various gastric ulcers and duodenal ulcers. The active ingredients can be quickly absorbed by the human body, and the bioavailability can reach 35% when it is administered orally for the first time ^[7]. In addition, as the administration cycle of omeprazole prolongs, the bioavailability of the active ingredients increases, and most patients reach the peak blood concentration within 1–3 hours of taking the drug, which can regulate the index of gastric motility on the basis of inhibiting gastric acid secretion ^[8].

Combined with the data analysis in this paper, the symptom scores of gastric ulcer patients in the study group were lower than those in the control group ($P < 0.05$); in the study group patients with gastric ulcer, their heartburn time was 4.51 ± 0.45 d, epigastric pain time was 4.62 ± 0.47 d, acid reflux time was 5.19 ± 0.57 d, fullness time was 3.01 ± 0.25 d, and Hp negative time was 6.01 ± 0.87 d, which were all shorter than the control group ($P < 0.05$), showing that omeprazole + amoxicillin treatment of gastric ulcers can alleviate gastric ulcer symptoms, shorten the duration of gastric ulcer symptoms and Hp negative time. Analyzing the reasons, the combination of drugs for the treatment of gastric ulcers has the following advantages: it can exert the drug effect locally in the ulcer, and the combination of drugs has a low impact on the P450 enzyme in the liver, will not cause the inactivation of the P450 enzyme, and has a high rate of interaction with other drugs low and better tolerated by patients. In addition, omeprazole has high bioavailability and can continuously and stably exert its drug effect in the acidic environment of the stomach, and the drug effect is not affected by the patient's eating situation and taking antacids, making it safer and more efficient ^[9]. Another set of data showed that gastrin level was 70.48 ± 1.63 ng/L, motilin level was 236.11 ± 6.85 ng/L, cholecystokinin level was 12.18 ± 1.36 ng/L and other gastrointestinal hormone indexes in the study group were relatively better as compared to the control group ($P < 0.05$); the adverse reaction rate of gastric ulcer in the study group was 3.23%, which is lower than the control group (19.35%, $P < 0.05$). It shows that omeprazole + amoxicillin in the treatment of gastric ulcers can regulate the index of gastrointestinal hormones and reduce the adverse reaction rate of gastric ulcers. Analysis of the reasons shows that amoxicillin has strong cell penetration, and the effective ingredients absorbed by the intestinal tract are >90%; omeprazole can neutralize gastric acid, reduce the adverse stimulation of gastric acid to the gastric mucosa, and can also adjust the pH value in the stomach and relieve the burning and pain in the stomach. Combining omeprazole and amoxicillin can enhance the curative effect, relieve the symptoms of gastric ulcers, and benefit the prognosis of patients with gastric ulcers. However, during the actual treatment of patients with gastric ulcers, in addition to following the prescribed medication, it is also necessary to correct the patient's bad living habits, urge the patient to eat regularly, and choose light, easy-to-digest foods to repair the damaged gastric mucosa ^[10]. In addition, patients should also be advised to avoid hard, cold, and spicy foods to shorten the healing time of ulcers.

In summary, the omeprazole + amoxicillin regimen in the treatment of gastric ulcers can regulate the level of gastrointestinal hormones, relieve gastric ulcer symptoms, and shorten the time for Hp to become negative and the duration of ulcer symptoms, which has a promotional value.

Disclosure statement

The author declares no conflicts of interest.

References

- [1] Du H, 2020, Comparison of the Effect of Pantoprazole and Omeprazole Combined with Clarithromycin and Amoxicillin in the Treatment of *Helicobacter pylori* Positive Duodenal Ulcer. Shanxi Medical Journal, 49(21): 2937–2938.
- [2] Wang H, 2022, Analysis of the Clinical Effect of Amoxicillin, Clarithromycin Combined with Esomeprazole in the Treatment of Gastric Ulcer Patients with *Helicobacter pylori* Infection. Frontiers of Medicine, 12(6): 15–17.
- [3] Song Z, Li B, 2022, Clinical Effect of Rabeprazole Combined with Clarithromycin and Amoxicillin in the Treatment of Gastric Ulcer. Chinese Journal of Clinical Rational Drug Use, 15(7): 67–69.
- [4] Suo N, 2020, Observation on the Curative Effect of Amoxicillin, Clarithromycin Combined with Lansoprazole in the Treatment of Duodenal Ulcer Complicated with *Helicobacter pylori* Infection. Chinese Journal of Clinical Rational Drug Use, 13(1): 93–95.
- [5] Wang X, 2022, Study on the Effect of Rabeprazole and Clarithromycin Combined with Amoxicillin in the Treatment of Gastric Ulcer. Chinese Modern Drug Application, 16(6): 126–128.
- [6] Sun A, 2022, Evaluation of the Effect of Omeprazole + Amoxicillin in the Treatment of Patients with Gastric Ulcer. Chinese and Foreign Women's Health Research, 8(23): 33–34 + 58.
- [7] Wang D, 2022, The Effect of Amoxicillin Combined with Omeprazole on the Adverse Reaction Rate and Symptom Improvement Time in Patients with Gastritis and Gastric Ulcer. Chinese Science and Technology Journal Database (Digest Edition) Medicine and Health, 4(5): 70–72.
- [8] Cao Y, 2022, The Effect of Omeprazole Combined with Amoxicillin in the Treatment of Gastritis Complicated with Gastric Ulcer. Chinese Science and Technology Journal Database (Citation Edition) Medicine and Health, 7(10): 57–59.
- [9] Chen X, 2022, Study on the Value of Omeprazole Combined with Amoxicillin in the Treatment of Patients with Gastritis Complicated with Gastric Ulcer. Chinese Science and Technology Journal Database (Full Text Version) Medicine and Health, 4(2): 84–86.
- [10] Yang H, 2022, Analysis of the Clinical Effect Difference between Omeprazole and Amoxicillin in the Treatment of Gastric Ulcer. Chinese Science and Technology Journal Database (Full Text Version) Medicine and Health, 5(12): 67–69.

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