

Analysis of the Effectiveness of Biling Weitong Granules Combined with Trimethoprim and Vonoprazan in The Treatment of Reflux Esophagitis

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Abstract: *Objective:* To analyze the effectiveness of Biling Weitong Granules (BLWTG) combined with trimethoprim and vonoprazan in treating reflux esophagitis. *Methods:* Sixty patients with reflux esophagitis admitted to our hospital from March 2020 to March 2023 were selected as study subjects and randomly divided into a control group and an experimental group, with 30 cases in each group. The control group received only the combination treatment of trimethoprim and vonoprazan, while the experimental group was treated with BLWTG based on the control group. The acid reflux and heartburn symptom scores, quality-of-life scores, clinical efficacy, Chinese medicine symptom incidences, and the occurrence of adverse reactions before and after treatment in the two groups were compared. *Results:* After treatment, the acid reflux and heartburn symptom scores of patients in the experimental group were lower than those of the treatment control group, and the quality-of-life scores were higher than those of the treatment control group ($P < 0.05$). The total clinical efficacy of the experimental group was 96.66%, which was significantly higher than that of the control group (73.33%, $P < 0.05$). After treatment, the incidence of Chinese medicine symptoms, such as nausea and vomiting, abdominal distension and abdominal pain, and loss of appetite of the patients in the experimental group were significantly lower than those of the control group ($P < 0.05$). During the treatment period, there was no significant difference in the incidence of adverse reactions between the two groups, which indicated that the safety of the two treatments was comparable ($P > 0.05$). *Conclusion:* BLWTG combined with trimethoprim and vonoprazan was safe and reliable in treating reflux esophagitis, effectively relieving the symptoms and improving its clinical efficacy. This treatment is worthy of popularization.

Keywords: Biling weitong granules; Trimethoprim; Vonoprazan; Reflux esophagitis

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1. Introduction

Reflux esophagitis is a common digestive disease, mainly manifesting as belching, epigastric distension, heartburn, and acid reflux. Reflux esophagitis is one of the common diseases in gastroenterology, induced by the reflux of

gastric and duodenal contents into the esophagus due to various factors. Recently, with the accelerated pace of life, the incidence of reflux esophagitis is increasing yearly^[1,2]. According to relevant surveys, gastroesophageal reflux disease (GERD) is a disease induced by an elevated incidence of gastroesophageal reflux, where the contents of the stomach or duodenum flow back into the esophagus after entering the food chyme. It may also be accompanied by complications that appear as clinical manifestations^[3,4]. The treatment of reflux esophagitis is mainly based on acid inhibitors, esophageal mucosal protectants, and gastrointestinal dynamics drugs. Proton pump inhibitors can selectively and non-competitively inhibit the activity of gastric mucosal cells H⁺K⁺-ATPase, exhibiting a significant acid inhibition effect^[5-7]. However, drug therapy is often unsatisfactory and prone to recurrence. Therefore, finding a safe and effective drug for treating reflux esophagitis is crucial. Currently, domestic scholars mainly use acid-suppressing drugs and prokinetic drugs in the treatment of reflux esophagitis, but the use of these drugs alone has certain limitations. Biling Weitong Granules (BLWTG) is a classic formula of traditional Chinese medicine (TCM) commonly used in treating gastroepidermal pain, with the advantages of promoting qi and blood circulation, balancing the stomach environment, and relieving pain. BLWTG has a certain degree of efficacy for the treatment of gastroepidermal pain caused by qi stagnation and blood stasis^[8].

2. Information and methods

2.1. General information

Sixty patients with reflux esophagitis admitted to the hospital from March 2020 to March 2023 were selected. Inclusion criteria: (1) Patients aged over 18 and below 60 years old; (2) diagnosed with reflux esophagitis; (3) had not received relevant treatment or had stopped treatment for at least 3 months; (4) consented. Exclusion criteria: (1) Patients with serious cardiac, hepatic, renal dysfunction or coagulation dysfunction; (2) pregnant or breastfeeding women; (3) previous history of reflux esophagitis; (4) serious mental disorders; (5) presence of other serious diseases.

2.2. Methods

Gastroscopy was performed for all 60 patients and an X-ray barium meal and gastroscopy were performed according to the examination results. The experimental group was treated with BLWTG (Chengdu Huarong Pharmaceutical Co., Ltd.) combined with trimethoprim (Jiangsu Haosen Pharmaceutical Co., Ltd.) and vonoprazan (GlaxoSmithKline), which consisted of wicker bell (10 g), (5 g), *Saussurea costus* (10 g), and cloves (6 g). One dose was prepared daily and the decoction was made twice a day with 200 mL water each time, once in the morning and once in the evening. The control group was treated with trimethoprim (Jiangsu Haosen Pharmaceutical Co., Ltd.) combined with vonoprazan (GlaxoSmithKline), which consisted of trimethoprim (15 mg/tablet), vonoprazan (20 mg/tablet), in the morning and evening. Both groups were treated for 8 weeks.

2.3. Observation indicators

2.3.1. Acid reflux and heartburn symptom scores and quality of life scoring indexes before and after treatment of the two groups of patients

Acid reflux and heartburn symptom scores were scored using a 5-level scale, where a score of 0 indicated no symptoms and a score of 4 indicated severe symptoms. The quality-of-life score was conducted through a health survey (SF-36) that included 6 items. Each item score ranged from 0–100 and the average of the 6 scores was calculated. A higher score represents a better quality of life.

2.3.2. Clinical efficacy observation indexes

The clinical efficacy was said to have an obvious effect when the patient's symptoms completely subsided and the esophageal kinetic indexes returned normal. The clinical efficacy was said to be effective when the patient exhibits a significant improvement in symptoms and esophageal kinetic indexes. The clinical efficacy was said to be ineffective when there was no significant improvement in symptoms and esophageal kinetic indexes after treatment.

2.3.3. TCM evidence points

The 4-level scoring method was used to evaluate the patient's symptoms of early satiety, abdominal distension, abdominal pain, and loss of appetite. Zero points = no relevant or mild symptoms. 1 point = mild symptoms and have some impact on daily life, but is not serious. 2 points = moderate symptoms and significantly impact the patient's daily life, but is still tolerable. 3 points = severe symptoms with great impact on daily life and seriously interferes with the patient's normal functioning. With this, the severity of the patient's symptoms can be clearly understood and utilized as a reference index to assess the effectiveness of the treatment.

2.4. Statistical treatment

The SPSS 18.0 software was for statistical analysis. The measurement data were expressed as mean \pm standard deviation and compared and analyzed using the *t*-test and chi-squared (χ^2) test. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Comparison of general information between the two groups

As shown in **Table 1**, the comparison of gender, age, average duration of disease, and average body mass index (BMI) of the two groups was not statistically significant ($P > 0.05$).

Table 1. Comparison of general data between the two groups of patients (mean \pm standard deviation)

Group (<i>n</i> = 30)	Gender		Average age (years)	Average duration of illness (months)	Mean body mass index (BMI)
	Male	Female			
Control group	16	14	38.51 \pm 5.43	6.86 \pm 2.85	22.15 \pm 2.68
Observation group	15	15	38.59 \pm 5.37	6.67 \pm 2.84	22.16 \pm 2.73
χ^2/t	0.067		0.057	0.271	0.014
<i>P</i>	0.800		0.954	0.787	0.989

3.2. Comparison of acid reflux and heartburn symptom scores and quality of life scores between the two groups of patients before and after treatment

As shown in **Table 2**, the acid reflux and heartburn symptom scores and quality-of-life scores of the two groups of patients before treatment were not statistically significant ($P > 0.05$). After treatment, the acid reflux and heartburn symptom scores of patients in both groups were lower than those before treatment, and the quality-of-life scores were higher than those before treatment. The acid reflux and heartburn symptom scores of patients in the observation group were lower than those of the control group, and the quality-of-life scores were higher than those of the control group ($P < 0.05$).

Table 2. Comparison of acid reflux and heartburn symptom scores and quality-of-life scores between the two groups before and after treatment (mean ± standard deviation)

Group (n = 30)	Symptom Score				Quality-of-life score	
	Acid reflux		Heartburn		Before treatment	After treatment
	Before treatment	After treatment	Before treatment	After treatment		
Control group	2.46 ± 0.23	0.58 ± 0.14	2.59 ± 0.27	0.73 ± 0.23	75.93 ± 6.49	87.95 ± 4.26
Observation group	2.49 ± 0.20	0.47 ± 0.10	2.64 ± 0.30	0.58 ± 0.20	75.95 ± 6.53	93.72 ± 3.23
<i>t</i>	0.539	2.576	0.678	2.696	0.012	2.838
<i>P</i>	0.591	0.001	0.500	0.009	0.991	0.006

3.3. Comparison of clinical efficacy between the two groups

As shown in **Table 3**, the clinical efficacy in the experimental group was as high as 96.66%, significantly higher than that of the control group ($\chi^2 = 10.811$, $P < 0.05$).

Table 3. Comparison of clinical efficacy between the two groups (n)

Group (n = 30)	Obvious effect	Effective	Ineffective	Total
Control group	12	10	8	22
Observation group	16	13	1	29
χ^2			10.811	
<i>P</i>			0.001	

3.4. Comparison of TCM symptom scores between the two groups

As shown in **Table 4**, the TCM symptom scores between the two groups before treatment were not significant ($P > 0.05$). After treatment, the TCM symptom scores of the experimental group were lower than those of the control group ($P < 0.05$).

Table 4. Comparison of TCM symptom scores between the two groups (mean ± standard deviation, points)

Group (n = 30)	Early satiety		Bloating and abdominal pain		Loss of appetite	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group	2.55 ± 0.43	0.72 ± 0.15	2.46 ± 0.45	0.84 ± 0.23	2.47 ± 0.49	0.93 ± 0.26
Observation group	2.53 ± 0.45	0.62 ± 0.14	2.43 ± 0.48	0.71 ± 0.21	2.40 ± 0.48	0.74 ± 0.23
<i>t</i>	0.176	2.670	0.250	2.286	0.560	2.998
<i>P</i>	0.861	0.009	0.804	0.026	0.578	0.004

3.5. Comparison of adverse reactions between the two groups

As shown in **Table 5**, patients in the experimental group had 2 cases of nausea and vomiting, accounting for 6.66%; 2 cases of abdominal distension and abdominal pain, accounting for 6.66%; 1 case of loss of appetite, accounting for 3.33%; 1 case of dyspepsia, accounting for 3.33%; 3 cases of nausea and vomiting, accounting for 10.00%; 4 cases of abdominal distension and abdominal pain, accounting for 13.33%; 1 case of loss of appetite, accounting for 3.33%. The difference in the incidence of adverse reactions between the two groups

was not statistically significant ($P > 0.05$).

Table 5. Comparison of adverse reactions between the two groups of patients (n)

Group ($n = 30$)	Nausea and vomiting	Bloating and abdominal pain	Loss of appetite	Indigestion	Total
Control group	3	4	1	1	9
Observation group	2	2	1	1	6
χ^2		0.800			
P		0.371			

4. Discussion

Reflux esophagitis is a common digestive disease caused by the reflux of gastroduodenal contents into the esophagus. Clinical symptoms mainly include heartburn, acid reflux, and retrosternal pain, which can cause esophageal stenosis in severe cases, and even lead to esophageal adenocarcinoma. As living standards and the pressure of life increase, the incidence of this disease rises yearly. According to TCM, reflux esophagitis is categorized as “chancre,” “stagnation,” and “nausea.” It is believed that the disease originates from liver and spleen dysfunction and a deficiency of the spleen qi. As the disease progresses, it may lead to symptoms such as spleen and stomach qi imbalance and spleen deficiency, which disrupts the spleen’s transport function and the inability of spleen qi to be distributed, ultimately leading to stagnation of stomach qi, reduced receptive function, and the inability of stomach qi to descend^[9]. For Western medicine, drugs to promote gastrointestinal dynamics, histamine H2 receptor blockers, proton pump inhibitors, etc. are mostly used to treat reflux esophagitis.

BLWTG is a kind of proprietary Chinese medicine that utilizes aroma to facilitate the movement of qi, disperse cold, and relieve pain. Among them, wicker and sedum plants are effective in moving qi and relieving pain. Cloves are warm in nature and pungent in flavor and have the effect of warming the middle abdomen, and kidney and supporting yang energy. The combination *Citrus aurantium*, and *Magnolia officinalis* is effective for dredging the liver, dispersing cold, and relieving pain. It has a certain effect in the treatment of reflux esophagitis and is worthy of clinical promotion and application.

In Western medicine, the treatment of reflux esophagitis is based on the administration of acid inhibitors, such as omeprazole and rabeprazole. In TCM, it is based on utilizing medicinal decoctions like stomach pain decoctions, Chaihu Shugan San, Baohe Wan, etc. The results of this study showed that the total clinical efficacy and therapeutic effect of the experimental group were significantly higher than that of the control group ($P < 0.05$).

5. Conclusion

The use of BLWTG combined with trimethoprim and vonoprazan in the treatment of reflux esophagitis is safe and reliable, effectively relieves symptoms, improves clinical efficacy, and is worthwhile to be popularized and used in the clinic.

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Disclosure statement

The authors declare no conflict of interest.

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