

Clinical Study on Acupoint Application of Jianpi Powder Combined with Chinese Medicine Decoction in Chronic Atrophic Gastritis

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Keywords

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Abstract

Background To investigate the clinical effects of acupoint application with Jianpi Powder combined with Chinese herbal decoction in chronic atrophic gastritis (CAG).**Methods:** 140 patients with CAG of spleen deficiency and phlegm stasis type from January 2018 to January 2020 were selected and divided into control and observation groups, with 70 cases in each group. The patients in control group was given Chinese medicine decoction, and those in the observation group was given acupoint application of Jianpi Powder combined with Chinese medicine decoction. The clinical efficacy, the levels of gastrograph index and inflammatory factors, life quality and the occurrence of adverse effects were compared.**Results:** After treatment, the total effective rate of the observation group was obviously higher than that of the control group. The amplitudes of the pre-prandial and postprandial electrogastrograms were obviously higher, and those in the observation group were obviously higher compared with the control group. Interleukin-8 (IL-8), interleukin-11 (IL-11), and tumor necrosis factor (TNF- α) were decreased than those before treatment, and those in the observation group was lower. The scores of physical function, health status, social function, and mental health were obviously higher than those before treatment, with the significantly increase in patients of the observation group. There was no significant difference in the incidence of adverse effects.**Conclusion:** Acupoint application of Jianpi Powder with traditional Chinese medicine decoction has a significant effect on patients with CAG, with clinical symptoms improvement, inflammation reduction, and the recovery of gastric motility promotion.



1 Introduction

Chronic atrophic gastritis (CAG) is a gastrointestinal disease triggered by a variety of factors and characterized by thinning of the gastric mucosa, intestinal glandular hyperplasia, and glandular atrophy. Patients with CAG mainly clinically manifest some symptoms, including belching, nausea, loss of appetite, and acid reflux (1, 2). Currently, it has been confirmed by clinical studies that CAG may develop into gastric cancer (GC) after long-term evolution, which poses a serious threat to both the life and health of patients (3). Therefore, active treatment on CAG plays a pivotal role in GC prevention and treatment. In recent years, with the continuous development of Chinese medicine, significant progress has been made in the treatment of CAG. According to the belief of traditional Chinese medicine (TCM), CAG belongs to the category of “stomach pain” and “acid vomiting”, whose pathogenesis is related to the weakness of the spleen and stomach and the offence of external pathogen on the stomach (4). Acupuncture point application with TCM is a kind of Chinese medical treatment based on the theory of TCM and the principle of diagnosis and treatment. During the process, the medicine is administered in line with the evidence and the acupuncture point is selected according to the evidence. It has been proved that both herbal acupuncture point application and herbal tonics have their peculiar advantages in the treatment of CAG (5, 6). In light of this, the present study uses acupoint application with Jianpi powder combined with Chinese medicine decoction in the treatment of CAG, with the aims to investigate the clinical efficacy and its effects on life quality of patients with CAG, providing a reference for the clinical treatment of CAG. The detailed corresponding results are reported

as follows.

2 Materials and methods

2.1 Ethics statement

The Ethics Committee has reviewed and approved our study, and all enrolled patients have also signed the written informed consent for our study.

2.2 Subjects

140 patients with CAG of spleen deficiency and phlegm stasis type from January 2018 to January 2020 were selected and divided into control and observation groups according to the random number table method, with 70 cases in each group. All information on the patients was detailed in Table 1, where no statistical significance between these two groups was reported when it came to the basic data but the data were comparable. All patients enrolled complied to the criteria as listed.

Inclusion criteria: a) patients met the diagnostic criteria of Western medicine for CAG in accordance with “Consensus on Chronic Gastritis in China” (7); b) patients also met the diagnostic criteria of TCM for CAG as confirmed in “Consensus of diagnosis and treatment experts of chronic gastritis with Traditional Chinese Medicine (2017) (8)”; c) patients who didn’t take the same type of medication 1 week prior to the treatment.

Exclusion criteria: a) women who were in pregnancy or lactation; b) patients diagnosed with other gastrointestinal diseases such as gastric ulcer, duodenal ulcer, and upper gastrointestinal bleeding; c) patients with combined cardiac, hepatic and renal insufficiency; d) patients with psychiatric diseases or allergic to the medication in our study.

Table 1. Patients’ general information

Group	Cases	Gender (cases)		Age (years)	Duration of disease (years)	Degree of atrophy (cases)		
		Male	Female			I	II	III
Observation group	70	32	38	52.13±9.56	3.56±1.12	22	28	20
Control group	70	34	36	53.20±10.37	3.72±1.24	25	27	18

$\chi^2/t/Z$	0.115	-0.635	-0.801	-0.546
P	0.735	0.527	0.424	0.585

2.3 Treatment regimens

The control group was given Chinese herbal soup treatment (200 ml/dose in water decoction), including: 30 g of Bai Hua She She Cao (*Herba Hedyotis Diffusae*), 18 g of Huai Shan Yao (*Dioscorea opposita Thunb*), 18 g of Dan Shen (*Radix Salviae Miltiorrhizae*), 12 g of fried Bai Shao (*Radix Paeoniae Alba*), 9 g of fried Bai Shu (*Atractylodes macrocephala Koidz*), 9 g of raw Huang Qi (*Radix Astragali*), 6 g of Chai Hu (*Radix Bupleuri*), 9 g of Zhi Ban Xia (*Rhizoma Pinelliae Preparatum*), 9 g of Zhi Ke (*Fructus Aurantii*), 9 g of roasted Ci Wei Pi (*Corium Erinacei*), and 9 g of Guang Yu Jin (*Curcuma wenyujin*). All patients were administered 30 minutes after breakfast and dinner at 1 dose/time (2 times/day). The course lasted 6 months.

In addition to the therapy to the control group, the patients in the observation group were additionally treated with acupuncture application with Jianpi powder, and the formula was listed: 12 g of Xiao Hui Xiang (*Fructus Foeniculi*), 12 g of Zhi Xiang Fu (*Rhizoma Cyperi*), 12 g of Guang Mu Xiang (*Aucklandia lappa Decne*), 9 g of Cang Zhu (*Rhizoma Atractylodis*), 6 g of Gan Jiang (*Zingiberis Rhizoma*), 9 g of Hu Lu Ba (*Semen Trigonellae*), and 9 g of Huo Xiang (*Herba Agastaches*). The components were ground and mixed with appropriate amount of vinegar to make a poultice, which was evenly applied (about 3 g) to the patching material. The patch was applied to the Zhong Wan, Gui Yu, and Zu San Li acupuncture points in patients for 6 hours each time (1 time/day), with a treatment period of 6 months.

2.4 Observational index

(a) Clinical efficacy: the clinical efficacy was evaluated in accordance with these criteria (9). Healed: the clinical symptoms basically disappeared, and intestinal epithelial hyperplasia and gastric mucosal atrophy returned to normal. Excellent effective: clinical symptoms were improved, and intestinal epithelial hyperplasia and gastric mucosal atrophy

symptoms reduced, but did not return to normal. Effective: clinical symptoms were improved, and intestinal epithelial hyperplasia and gastric mucosal atrophy symptoms were slightly ameliorated. Ineffective: clinical symptoms did not improve significantly or even deteriorated.

(b) Gastrograph index: Before and after treatment, the EGEG-2D6 intelligent gastrointestinal electrogram instrument was used to measure the pre-prandial and postprandial gastrogram amplitudes of the two groups of patients respectively.

(c) Inflammatory factors: Before and after treatment, 3 ml of venous blood was collected from patients in both groups, and the levels of interleukin-8 (IL-8) (catalog no. SEA080Si03, ShrBio, Nanjing, China), interleukin-11 (IL-11) (catalog no. SEA057Hu02, ShrBio, China), and tumor necrosis factor (TNF)- α (catalog no. ml077385, MLBio, Shanghai, China) were measured with enzyme-linked immunosorbent assay.

(d) Life quality: Before and after treatment, the life quality of patients in both groups was assessed using the Short Form of Health Survey (SF-36) (10), which mainly included 4 dimensions of physical function, health status, social function, and mental health, with a total of 36 entries, and a higher score indicated a better life quality.

(e) Adverse effects: The adverse effects in patients of both groups were monitored during the treatment.

2.5 Statistical analysis

Data were expressed as mean \pm standard deviation (SD) and were analyzed using SPSS 20.0 (IBM Corporation, Endicott, NY, USA). Statistical significance was determined with both chi-square test and t test when $P < 0.05$.

3 Results

3.1 Comparison on clinical efficacy

After treatment, the total effective rate was 91.43% in the observation group and 78.57% in the control

group, and the rate in the observation group was significantly higher than that of the control group ($p < 0.05$; Table 2).

Table 2. The comparison on the clinical efficacy [case (%)]

Group	Cases	Healed	Excellent effective	Effective	Ineffective	Total effective rate
Observation group	70	37 (52.86)	18 (25.71)	9 (12.86)	6 (8.57)	64 (91.43)
Control group	70	28 (40.00)	12 (17.14)	15 (21.43)	15 (21.43)	55 (78.57)
χ^2						4.538
P						0.033

3.2 Comparison on Gastrograph index

Before treatment, there was no statistical difference between the two groups when it comes to the pre-prandial and postprandial amplitudes ($p > 0.05$; Table 3). After treatment, however, the pre-prandial and postprandial amplitudes were significantly higher in the two groups, and those in the observation group were evidently higher compared with the control group ($p < 0.05$; Table 3).

3.3 Comparison on the inflammatory factors

Before the treatment, no statistical significance concerning the levels of IL-8, IL-11, and TNF- α ($p > 0.05$; Table 4). However, the levels of IL-8, IL-11,

and TNF- α of all patients were increased evidently, among which patients in observational group presented the lower levels compared to those of control group ($p < 0.05$; Table 4).

3.4 Comparison on the life quality

There was no statistical difference between the two groups regarding the scores of somatic function, health status, social function, and mental health before treatment ($P > 0.05$; Table 5). After treatment, those scores were significantly higher in both groups than before treatment ($P < 0.05$; Table 5), and those in the observation group were significantly higher compared with the scores of the control group ($P < 0.05$; Table 5).

Table 3. Comparison of gastric electrogram index (μV)

Group	Cases	Pre-prandial electrogram amplitude		Postprandial electrogram amplitude	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	70	105.62±22.85	136.62±18.42*	185.26±25.60	238.62±26.56*
Control group	70	108.72±20.46	125.25±23.34*	181.25±24.85	220.35±28.62*
t		-0.846	3.199	0.940	3.915
P		0.399	0.002	0.349	0.000

* $p < 0.05$, vs. Before treatment

Table 4. The comparison on the inflammatory factors

Group	Cases	IL-8 (pg/mL)		IL-11 (ng/L)		TNF- α (ng/L)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	70	42.36±7.62	22.63±5.70*	58.34±8.84	37.62±6.38*	48.62±9.52	25.38±4.56*
Control	70	43.56±8.28	30.42±6.85*	60.14±10.52	48.26±8.44*	49.38±10.25	33.74±6.75*

group							
<i>t</i>	-0.894	-7.314	-1.096	-8.414	-0.455	-8.586	
<i>P</i>	0.373	0.000	0.275	0.000	0.650	0.000	

**p*<0.05, vs. Before treatment

Table 5. The comparison on life quality (points)

Group	Case	Somatic function		Health Status		Social Functions		Mental Health	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	70	70.62±8.34	85.62±6.33*	68.34±9.52	82.62±6.58*	72.36±6.58	86.56±6.58*	65.34±7.41	80.62±6.67*
Control group	70	71.28±7.63	80.46±5.87*	67.23±7.38	77.30±7.52*	73.35±5.64	82.62±5.85*	66.48±6.92	76.32±7.54*
<i>t</i>		-0.489	5.001	0.771	4.454	-0.956	4.694	-0.941	3.574
<i>P</i>		0.626	0.000	0.442	0.000	0.341	0.000	0.348	0.000

**p*<0.05, vs. Before treatment

3.5 Comparison on the adverse effects

The incidence of adverse effects in the observation group was 8.57% (6/70), including 2 cases of dizziness and headache, 3 cases of nausea and vomiting, and 1 case of diarrhea, and that in the control group was 12.86% (9/70), including 3 cases of dizziness and headache, 4 cases of nausea and vomiting, and 2 cases of diarrhea. There was no statistically significance with regard to the incidence of adverse reactions in the two groups ($\chi^2=0.672$, *P*=0.412).

4 Discussion

In recent years, with the change of people’s dietary habits and lifestyles, the incidence of CAG has been on a continuous rise, which seriously affects the life quality of patients (11, 12). Currently, Western medicine is mainly used to treat patients with CAG. Despite the certain progress, the pathogenesis of CAG remains unclear, and no specific medications have been developed clinically, which results in unsatisfactory efficacy (13, 14). In accordance with the belief of TCM, CAG belongs to the categories of “noisy”, “stomachic pain”, and “fullness”, among which the spleen deficiency and phlegm stasis are more typical. The nature of CAG is mainly a mixture

of deficiency and actuality, with the deficiency being based on splenic Qi deficiency and stomachic Yin deficiency, and the actuality being dependent on Qi stagnation, damp heat and blood stasis. The etiology of CAG is complicated, which is mostly caused by internal dietary injury and external pathogen, resulting in Qi and blood stagnation, phlegm stasis, and splenic and stomachic weakness. Therefore, the clinical treatment of CAG should be based on strengthening the spleen and dispelling phlegm, removing stasis and dispersion, and benefiting blood and Qi (15).

Several Chinese herbs, such as Bai Hua She She Cao (*Herba Hedyotis Diffusae*), Huai Shan Yao (*Dioscorea opposita Thunb*), Dan Shen (*Radix Salviae Miltiorrhizae*), fried Bai Shao (*Radix Paeoniae Alba*), fried Bai Shu (*Attractylodes macrocephala Koidz*), raw Huang Qi (*Radix Astragali*), Chai Hu (*Radix Bupleuri*), and Zhi Ban Xia (*Rhizoma Pinelliae Preparatum*), are used in the present study. Bai Hua She She Cao (*Herba Hedyotis Diffusae*) can eliminate the carbuncle and clot and benefit the wet and drench, while Huai Shan Yao (*Dioscorea opposita Thunb*) has the effects on invigorating Qi, spleen, lung and kidney and nourishing Yin. Dan Shen (*Radix Salviae Miltiorrhizae*) can promote the blood circulation, remove blood stasis and relieve pain. Fried Bai Shao

(*Radix Paeoniae Alba*) is proved to remove dampness, invigorate spleen and replenish Qi. Raw Huang Qi (*Radix Astragali*) is underlined to possess the effects of spleen and Qi invigoration. Zhi Ban Xia (*Rhizoma Pinelliae Preparatum*) can eliminate dryness and phlegm and disintegrate the clot. Fried Bai Shao (*Radix Paeoniae Alba*) can nourish the blood and astringing the Yin. Chai Hu (*Radix Bupleuri*) is beneficial for raising Yang and Qi. All the medication together can achieve the effects of strengthening the spleen, dispelling phlegm, resolving blood stasis, dispersing knots, benefiting Qi and invigorating Blood. In addition, this formula of Jianpi powder consists of Xiao Hui Xiang (*Fructus Foeniculi*), Zhi Xiang Fu (*Rhizoma Cyperi*), Guang Mu Xiang (*Aucklandia lappa Decne*), Cang Zhu (*Rhizoma Atractylodis*), Gan Jiang (*Zingiberis Rhizoma*), Hu Lu Ba (*Semen Trigonellae*), and Huo Xiang (*Herba Agastaches*), which have the effects of warming and transportation, with the disperse of cold and the attenuation of pain. The Zhong Wan acupuncture point is both the localization point of Renmai and the fundraising intersection point of stomach and other organs. According to Wang et al. (16), the meridian around the Zhong Wan acupuncture point is closely related to the stomach meridian of foot-yang, and the stimulation on Zhong Wan acupuncture point has the function of adjusting the Yin and Yang of the internal organs and invigorating the spleen and stomach. The Wei Yu acupuncture point belongs to bladder meridian, which is the point where the Qi of the internal organs is infused. The application of Jianpi Powder to the Wei Yu acupuncture point can regulate the stomach function, relieve stomach spasm, and improve tissue metabolism. The Zu San Li acupuncture point belongs to the stomach meridian of foot-yangming, which is a lower gastric meridian. It has been shown that stimulating the Zu San Li acupuncture point can promote gastrointestinal peristalsis and improve the activity of gastrointestinal digestive enzymes (17). Meanwhile, the application of Jianpi powder to the Zhong Wan, Wei Yu and Zu San li acupuncture points can elicit dual effects of both medicine and acupuncture points, which can harmonize the Qi,

blood, Yin, and Yang within the body, and alleviate the clinical symptoms like stomach pain and acid vomiting in patients, thus effectively improving their life quality. In this study, the total effective rate, pre-prandial and postprandial electrogram amplitudes, and scores of life function in patients of both groups were significantly higher than those before treatment, and those in the observation group was significantly higher than the control group, indicating that the combination of acupoint application with Jianpi powder and Chinese medicine decoction can significantly alleviate the clinical symptoms of patients with CAG, promote the recovery of gastric function and improve the life quality.

Studies have shown that the disorder of immune mechanism in CAG patients produces local inflammation and then triggers the massive release of inflammatory factors such as IL-8, IL-11, and TNF- α , which in turn aggravates gastric mucosal damage (18, 19). In this study, after treatment, the levels of IL-8, IL-11 and TNF- α in patients of both groups were significantly lower than those before treatment, and those in the observation group was significantly lower than the control group, suggesting that the combination of acupoint application with Jianpi powder and Chinese medicine decoction can significantly attenuate the inflammatory response of the organism and decrease the gastric mucosa damage in CAG patients. Modern pharmacological studies have unveiled that the Bai Hua She She Cao (*Herba Hedyotis Diffusae*) poses inhibitory effects on pathogenic bacteria such as *Staphylococcus aureus* and *Pseudomonas aeruginosa*, and can enhance the immunity of the body, while Huai Shan Yao (*Dioscorea opposita Thunb*) is rich in polysaccharides, which can strengthen the immune function of the body by enhancing the phagocytosis of leukocytes and promoting anti-inflammatory effects. The phenolic acid compounds within Dan Shen (*Radix Salviae Miltiorrhizae*) possess a strong anti-inflammatory activity, and the active substance of fried Bai Shao (*Radix Paeoniae Alba*) can down-regulate the body's TNF- α , IL-8 and other inflammatory factors to achieve anti-inflammatory effects (20). Meanwhile,

Xiao Hui Xiang (*Fructus Foeniculi*), Cang Zhu (*Rhizoma Atractylodis*) and Huo Xiang (*Herba Agastaches*) in the prescription of Jianpi powder have significant anti-inflammatory and analgesic effects, and the application with Jianpi powder to the Zu San Li acupuncture point can reduce the inflammatory response of the body by inhibiting nuclear factor- κ B (NF- κ B) signaling pathway of B cells and down-regulating the expression of inflammatory factor genes such as IL-8 and IL-11 (21). Furthermore, the Jianpi powder can regulate the body's immune cells, maintain the body's immune balance, reduce the level of pro-inflammatory factors, and mitigate gastric mucosal damage via the stimulation on the Zu San Li, Zhong Wan, and Wei Yu acupuncture points. In addition, there was no statistically significant difference concerning the incidence of adverse effects between the two groups, indicating that the combination of acupoint application with Jianpi powder and Chinese medicine decoction is safe in the treatment of CAG.

In conclusion, the combination of acupoint application with Jianpi powder and Chinese medicine decoction poses a remarkable efficacy in the treatment of CAG, with the improvement on clinical symptoms, reduction on the inflammatory response and promotion on the recovery of gastric dynamics within the body, as well as some certain safety.

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Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

Author contributions

Conceptualization, X.Y.C and C.F.H; Data curation, X.Y.C; Formal analysis, C.F.H; Methodology, X.Y.C; Writing-Original draft, C.F.H and X.Y.C; Writing-review and editing, C.F.H and X.Y.C; All authors have read and agreed to the published version of the manuscript.

Ethics Approval and Consent to Participate

Exploration and Verification Publishing

The study was approved by the Medical Ethics Committee, and the patients were informed and consented.

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Availability of Data and Materials

The data presented in this study are available on request from the corresponding author.

Supplementary Material

Not applicable

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