

Efficacy of Woxuan needling and Xiangsha Liujunzi decoction on traditional Chinese medicine syndromes and gastric biomarkers in *Helicobacter pylori*-positive chronic gastritis

Yiting Du*, Yong Yu and Boyang Wei

Department of Gastroenterology, Jiangxi Province Hospital of Integrated Chinese and Western Medicine, Nanchang, China

Abstract: Background: Chronic non-atrophic gastritis is a common digestive system disease with a high incidence. While Traditional Chinese Medicine (TCM) offers unique therapeutic approaches, the specific combined efficacy of Woxuan needling and Xiangsha Liujunzi decoction warrants further clinical investigation. **Objectives:** To explore the effect of Woxuan needling combined with Xiangsha Liujunzi decoction on traditional Chinese medicine syndromes in patients with chronic non-atrophic gastritis. **Methods:** Convenience sampling was used to select 120 patients with chronic gastritis admitted to Jiangxi Province Hospital of Integrated Chinese and Western Medicine between 1 January 2022 and 1 January 2023. According to the order of enrolment, they were divided into an observation group and a control group using a random number table. The control group received basic drug treatment combined with Xiangsha Liujunzi decoction, whereas the observation group received Woxuan needling in addition to the control treatment. **Results:** Compared with the control group, the levels of stomach burning, abdominal distension or dull pain, loose stools, fatigue, shortness of breath and poor appetite were significantly lower in the observation group after treatment ($p < 0.05$). The serum pepsinogen level, gastroscopy score and gastrointestinal symptom rating scale score were also lower, whereas the gastrin level was higher in the observation group ($p < 0.05$). **Conclusion:** Treating patients with chronic non-atrophic gastritis with Woxuan needling combined with Xiangsha Liujunzi decoction can improve clinical symptoms and enhance therapeutic efficacy.

Keywords: Chronic non-atrophic gastritis; Traditional Chinese medicine syndrome; Woxuan needling; Xiangsha Liujunzi decoction

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INTRODUCTION

Chronic gastritis is a chronic inflammation of the gastric mucosa and it includes chronic atrophic gastritis (CAG) and chronic non-atrophic gastritis (chronic superficial gastritis). It is a digestive system disease and is very common in clinical practice. Its incidence is very high, ranking first among various stomach diseases (Yan *et al.*, 2019). The clinical manifestations of chronic gastritis are diverse and may include fullness, epigastric discomfort and burning pain (Yang and Hu 2022). To date, the pathogenesis of chronic gastritis has not been fully elucidated. However, *Helicobacter pylori* (H. pylori) infection, dietary factors and environmental factors are recognised as the main causes (Yang and Hu., 2022).

The treatment of chronic gastritis in Western medicine is currently mainly symptom based. For example, pyloric sphincter dysfunction may lead to bile reflux in some patients, who can be given aluminium magnesium carbonate preparations combined with cholic acid to eliminate or reduce bile reflux (Yang *et al.*, 2024). If patients have altered gastrointestinal motility, they can be given prokinetic drugs such as domperidone, itopride hydrochloride or mosapride (Niu *et al.*, 2021). However, in long-term or large-scale use, the adverse reactions can be considerable.

In traditional Chinese medicine (TCM), chronic gastritis belongs to the category of ‘epigastric pain’. Syndrome differentiation in gastritis is divided into five types: spleen deficiency and qi stagnation, spleen and stomach deficiency and cold, spleen and stomach damp heat, liver and stomach disharmony and stomach yin deficiency. The main causes of chronic gastritis are the invasion of external evils into the stomach, irregular diet, poor mood and long-term illness or fatigue, which can lead to vomiting and epigastric pain (Shah *et al.*, 2021). Traditional Chinese medicine posits that a relative dynamic balance exists between the various organs and tissues of the human body and the external environment, maintaining normal physiological activities (Wang *et al.*, 2020). When the body is invaded by external evils or exposed to excessive cold, the stomach’s qi mechanism becomes obstructed, disrupting harmony within the stomach and leading to epigastric pain.

Xiangsha Liujunzi decoction, a classic formula in TCM, has been widely used for centuries to treat spleen–stomach deficiency syndromes. It comprises eight herbs: *Dangshen*, to tonify spleen qi; *Baizhu and Fuling*, to strengthen spleen function and resolve dampness; *Chenpi*, to regulate qi and relieve stagnation; *Fabanxia*, to harmonise the stomach; *Zhigancao*, to moderate herbal properties; and *Muxiang* and *Amomum villosum*, to promote qi circulation and alleviate epigastric distension. Clinical trials have further

*Corresponding author: e-mail: du_yiting@126.com

demonstrated the efficacy of Xiangsha Liujunzi decoction in reducing gastric inflammation and improving symptoms in chronic gastritis (Liu *et al.*, 2020; Wang *et al.*, 2020).

Woxuan needling technique (pivoting needling method) is a specialised acupuncture method developed by the renowned Chinese acupuncture expert Zuo Changbo. It is grounded in the theory of 'Central Earth Pivoting, Earth as the Pivot of the Four Phases and the Unitary Qi Circulating Flow' from the classical text *Si Sheng Xin Yuan (The Heart Transmission of the Four Sages)*. This technique regulates the ascending and descending functions of the spleen and stomach (Zhongjiao) to re-establish the dynamic circulation of qi within the body. Modern studies suggest that such needling techniques may exert their therapeutic effects by modulating the autonomic nervous system, influencing gastrointestinal hormone secretion (such as motilin and gastrin) and regulating the brain-gut axis, thereby improving gastrointestinal motility and visceral sensitivity (Rabitti *et al.*, 2021; Wang *et al.*, 2021). Consequently, it serves as a therapeutic approach for internal miscellaneous diseases whose pathogenesis is characterised by 'spleen–stomach deficiency, impaired pivotal movement and disruption of the ascent–descent dynamic' (Kuang *et al.*, 2024). Clinical studies have shown that the total effective rate of acupuncture alone or combined with warm acupuncture in the treatment of chronic non-atrophic gastritis is considerably higher than that of Western medicine, especially in relieving symptoms such as epigastric fullness, acid regurgitation and belching (Wang *et al.*, 2021). The treatment of chronic non-atrophic gastritis is enhanced by combining acupuncture with Xiangsha Liujunzi decoction, whereby acupuncture regulates gastrointestinal motility and neuroendocrine function, and Xiangsha Liujunzi decoction invigorates the spleen, replenishes and regulates qi and resolves phlegm. The two treatments synergistically regulate gastrointestinal hormones, inhibit inflammation, enhance mucosal repair, improve the gastric mucosal microenvironment and clinical symptoms, enhance efficacy and reduce recurrence risk (Zhang *et al.*, 2024).

Several studies have examined the therapeutic effects of acupuncture and TCM on chronic gastritis. However, few have focused on the mechanism of the combination of acupuncture and medicine, forming a gap in the literature (Liu *et al.*, 2020; Weng *et al.*, 2023). Therefore, to further improve efficacy and provide more effective treatment methods for patients with chronic non-atrophic gastritis, this study explores the effects of Woxuan needling combined with Xiangsha Liujunzi decoction on TCM syndromes and serum pepsinogen I (PGI) and gastrin (GAS) levels in patients with chronic non-atrophic gastritis.

MATERIALS AND METHOD

Research participants

This study used a randomised controlled trial design. A convenience sampling method was used to select 120

patients with chronic non-atrophic gastritis between 1 January 2022 and 1 January 2023 at Jiangxi Province Hospital of Integrated Chinese and Western Medicine. According to the order of enrolment, the patients were randomly assigned a number based on a random number table. Odd numbers were assigned to the control group and even numbers to the study group. If the number of participants in a group reached 60, no further random numbers were selected and patients enrolled subsequently were directly assigned to the other group.

Inclusion and exclusion criteria

The diagnostic criteria for chronic gastritis were based on the relevant literature (Gastroenterology, 2023) and were as follows: Clinical manifestations – upper abdominal discomfort, dull pain, postprandial fullness, early satiety and other symptoms of indigestion; and gastroscopy according to the two types of chronic gastritis, chronic non-atrophic gastritis (including chronic superficial gastritis and chronic erosive gastritis) and CAG. Chronic non-atrophic gastritis is characterised endoscopically by visible mucosal erythema, bleeding points and plaques, surface mucosal roughness with or without oedema, congestion and exudation. Gastroscopy findings in CAG include red and white mucosa (mostly white), gastric folds that are gradually flattened or absent and some exposed mucosal blood vessels. It may also be accompanied by mucosal granules or nodules.

Patients who met the following conditions were included: (1) aged >18 years; (2) diagnosis consistent with the above diagnostic criteria for chronic non-atrophic gastritis; and (3) *H. pylori* positive. Patients who met the following conditions were excluded: (1) suspected or diagnosed malignant lesions combined with severe dysplasia of gastric mucosa; (2) combined with haematological diseases or abnormal coagulation function; (3) needle phobia; (4) lactating or pregnant women; (5) complicated with severe primary diseases of the brain, heart, liver, kidney or other major organs or a history of mental illness; (6) combined with malignant tumour; (7) allergic to TCM ingredients used in this study.

Study method

The conventional Western medicine treatment plan was based on the *Chinese Chronic Gastritis Diagnosis and Treatment Guide* (Gastroenterology, 2023), which included standard quadruple therapy. The specific medications were as follows: amoxicillin capsules (1 g) orally twice daily; furazolidone tablets (0.1 g) orally twice daily; 240 mg of bismuth potassium citrate (calculated as bismuth oxide) orally twice daily; and omeprazole enteric-coated capsules (20 mg) orally twice daily. These drugs were taken for 14 days.

Control group: As a routine basic treatment, Xiangsha Liujunzi decoction was used (Liu *et al.*, 2020). The prescription was as follows: 12 g of *Dangshen*, 12 g of *Fuling*, 12 g of *Baizhu*, 12 g of *Chenpi*, 12 g of *Fabaxia*,

6 g of *Zhigancao*, 8 g of *Muxiang* and 8 g of *A. villosum* (Houxia). The dosage of each herb was determined according to the standard dosing range recommended in the Chinese Pharmacopoeia and classical TCM formulary texts and was further supported by modern pharmacological studies indicating effective concentrations of active compounds for anti-inflammatory, gastroprotective and prokinetic effects (Liu *et al.*, 2021; Shi *et al.*, 2024; Lu *et al.*, 2025). The dosage of the prescription was adjusted according to the patient's condition: one dose per day, decocted twice, yielding approximately 250 mL of juice, taken twice daily in the morning and evening. Treatment was administered continuously for 6 days, followed by a 1-day rest interval, for a total treatment duration of 2 months.

Observation group: On the basis of the treatment protocol of the control group, Woxuan needling was applied. This needling technique was established by Zuo Changbo, a second-generation disciple of Dr. Dong, based on the theory of “the pivotal role of the spleen and stomach in the central axis and the continuous circulation of vital energy” (Wu *et al.*, 2022; Zuo *et al.*, 2015). The following acupoints were selected: Xinmen (right), Zusanli (right), Taichong (left) and Taibai (left). Right Xinmen: A point of Dr. Dong's special acupoints, located 1.5 transverse finger widths to the upper side from the olecranon process of the ulna, corresponding to the “wrist Zusanli,” which has the effect of reducing counterflow and regulating the qi mechanism of the heart and stomach (Yang and Dong, 1995). Right Zusanli: The confluent point of the Stomach Meridian and the lower confluent point of the stomach, which is mainly used for “reducing counterflow and purging,” guiding the stomach qi downward and cooperating with Xinmen to promote the right-side descending movement (Wang and Sun, 2004). Left Taichong: The source point of the liver meridian, which has the effect of soothing the liver and regulating qi, guiding the liver qi to ascend on the left side and assisting the spleen in transporting the clear qi upward. Left Taibai: The source point of the spleen meridian, which has the effect of strengthening the spleen and invigorating qi, cooperating with Taichong to promote the left-side ascending movement. The combination of these four points forms a pattern of “left ascending (Taichong and Taibai) and right descending (Xinmen and Zusanli),” rotating the middle burner, which is in accordance with the theory of the circulation of vital energy with “the spleen and stomach as the central axis and the four limbs as the wheels” (Lin, 2025). This pattern is suitable for symptoms of abnormal ascending and descending functions of the spleen and stomach and disharmony between the liver and stomach. The selected acupoints, such as Zusanli (ST36), have been demonstrated in neuroimaging and physiological studies to modulate the activity of brain regions involved in autonomic and pain processing (e.g., the insula and the anterior cingulate cortex) and to influence the activity of the vagus nerve, which plays a key role in gastrointestinal

function (Jang *et al.*, 2017; Xu and Li, 2025). The prescription and dosage of Xiangsha Liujunzi decoction were the same as for the control group. The following acupoints were selected: Xinmen (right), Zusanli (right), Taichong (left) and Taibai (left). Operation method: The patient was asked to lie on their back, relax, bend the elbow of the right upper limb and place their right hand under the xiphoid process. After skin disinfection, a 0.20 × 40 mm filiform needle was inserted. According to the acupuncture order of Woxuan needling, the following sequence was used: right heart door, right Zusanli, left Taichong and left Taibai, quickly penetrating the skin in turn. During acupuncture, the needle tips at the right heart door and right Zusanli were directed downwards towards the distal end of the limb, whereas those at the left Taibai and left Taichong were directed upwards, ensuring that the extension lines of the latter two needle tips intersected at one point. The depth was determined by the practitioner's conscious perception of deqi under the needle, as described in *Biaoyoufu*: ‘The arrival of qi is also like the ups and downs of fish swallowing hook bait’. After deqi, the right heart door and right Zusanli were gently twisted 5 times and the left Taibai and left Taichong were twisted 10 times. The needles were retained for 30 minutes, during which the patients were required to close their eyes, breathe gently, keep their limbs warm and remain comfortable. The procedure was performed three times a week for a total of 2 months.

Observation indicators

The general data of patients, TCM symptom scores, PGI, GAS, gastroscopy scores and gastrointestinal symptom rating scale (GSRS) scores were collected before treatment and 3 months after treatment. The general data included sex, age, body mass index and average disease duration.

The symptoms of chronic non-atrophic gastritis mainly include a preference for warmth in the stomach, epigastric fullness or dull pain, loose stools, fatigue, shortness of breath, lethargy and poor appetite. The scoring is based on the presence or absence of symptoms and the severity of the disease as follows: no symptoms = 0 points; mild symptoms = 2 points; moderate symptoms = 4 points; severe symptoms = 6 points (Liu *et al.*, 2020). **Gastrosopic features:** erythema (compared with the surrounding mucosa, there is obvious redness). Score: 3 points – extensive fusion; 2 points – dense spots or continuous linear blood; 1 point – scattered or intermittent linear congestion; 0 points – normal gastric mucosa (Zheng *et al.*, 2002). The GSRS was used to evaluate the severity of gastrointestinal symptoms (Qin *et al.*, 2023). The total score of the scale is 105 points, with a higher score indicating more severe symptoms.

Implementation of the blinding method

This study adopted a double-blind design. Participants in different groups were placed in separate wards and there was no interaction between the two groups. The evaluators who assessed the indices received standardised training

before evaluation and the grouping of participants was not disclosed to them.

Statistical analysis

The collected data were first entered into Excel 2013 software (Microsoft Corporation, Redmond, USA) for collation and then analysed using SPSS 26.0 (IBM, Armonk, NY, USA). The Kolmogorov–Smirnov test was used to assess the normality of the measurement data. Data following a normal distribution were expressed as mean $\pm$ standard deviation. The paired *t*-test was used for paired design data and the independent-samples *t*-test was used for data between groups. Count data were expressed as frequency (n) or rate (%) and the chi-square test was applied. A two-sided *p*-value of <0.05 was considered statistically significant. Based on the existing sample size and significance level ($p = 0.05$), the statistical power of this study was estimated to be between 76% and 85% using G*Power software.

RESULTS

General information

No adverse events or shedding occurred in the participants (Fig. S1). There were 60 participants in the observation group, comprising 28 men and 32 women, with an average age of 48.70 ± 9.51 years and an average course of 6.08 ± 2.15 years. There were 60 participants in the control group, comprising 31 men and 29 women, with an average age of 48.43 ± 8.99 years and an average course of 6.33 ± 1.69 years (Table 1).

Comparison of TCM symptom scores before and after treatment

There was no significant difference between the groups in the scores for stomach warmth, epigastric fullness or dull pain, loose stools, fatigue, shortness of breath, lethargy or poor appetite before treatment ($p > 0.05$). After treatment, the scores for stomach warmth (0.77 ± 0.98 vs 1.13 ± 1.00), epigastric fullness or dull pain (0.87 ± 1.00 vs 1.77 ± 0.65), loose stools (0.93 ± 1.01 vs 1.87 ± 0.50), fatigue (1.00 ± 1.01 vs 1.73 ± 0.78), shortness of breath (0.78 ± 1.00 vs 1.73 ± 0.86) and poor appetite (0.87 ± 1.00 vs 1.93 ± 0.63) in the observation group were lower than those in the control group (all $p < 0.05$) (Table 2).

Comparison of PGI and GAS before and after treatment

There was no significant difference in PGI and GAS levels between the two groups before treatment ($p > 0.05$), indicating that the baseline data were comparable. After treatment, the PGI level (60.58 ± 10.02 vs 83.95 ± 22.14) in the observation group was lower and the GAS level (120.10 ± 16.63 vs 105.57 ± 13.28) was higher than that in the control group ($p < 0.05$) (Table 3).

Comparison of gastroscopy score and GSRS scale score before and after treatment

There was no significant difference in gastroscopy score or GSRS score between the groups before treatment ($p > 0.05$),

indicating good comparability in these aspects. After treatment, the gastroscopy score (0.80 ± 0.40 vs 1.45 ± 0.50) and GSRS score (28.13 ± 5.18 vs 45.17 ± 6.62) in the observation group were lower than those in the control group ($p < 0.05$), (Table 4).

DISCUSSION

The primary finding of this randomized controlled trial is that the combination of Woxuan needling and Xiangsha Liujunzi decoction yielded significantly greater improvements in TCM syndrome scores, gastric biomarkers (PGI, GAS), endoscopic findings and GSRS scores compared to the herbal decoction alone in patients with *H. pylori*-positive chronic non-atrophic gastritis. This finding aligns with the growing body of evidence supporting the combination of acupuncture and herbal medicine for functional gastrointestinal disorders (Wang *et al.*, 2024; Zhang *et al.*, 2024). The following discussion interprets these findings by integrating TCM theory with contemporary biomedical mechanisms, critically analyzing biomarker dynamics and proposing a synergistic model of action.

Bridging TCM syndrome improvement to gastrointestinal physiology

The core TCM pathogenesis in our cohort aligns with "spleen-stomach deficiency" and "impaired pivotal movement," manifesting as epigastric fullness, pain and fatigue (Yan *et al.*, 2019; Yang *et al.*, 2024). The treatment principle was to fortify the spleen, regulate Qi and restore the ascent-descent dynamic of the Zhongjiao (spleen-stomach axis) using Xiangsha Liujunzi decoction (Liu *et al.*, 2020) and Woxuan needling (Kuang *et al.*, 2024).

The significant reduction in epigastric fullness and pain can be mechanistically linked to improved gastrointestinal motility and visceral sensitivity (Li *et al.*, 2021). Acupuncture, particularly at Zusanli (ST36), has been demonstrated to enhance gastric emptying and reduce visceral hypersensitivity through modulation of the vagus nerve and central pain pathways, a mechanism supported by neuroimaging studies (Zhang *et al.*, 2022; Li *et al.*, 2025). Concurrently, the prokinetic effects of herbal components, such as the volatile oils in *Amomum villosum* and costunolide in *Muxiang*, are well-documented (Chen *et al.*, 2017; Gao *et al.*, 2017). Thus, the synergy between needling and herbs likely normalized gastroduodenal coordination, providing a physiological basis for the alleviation of stagnation-related TCM symptoms.

Critical analysis of biomarker dynamics: PGI and GAS in clinical context

The observed changes in serum PGI and GAS levels provide a valuable, albeit complex, serological window into the therapeutic response. A critical analysis that contextualizes these findings within the broader literature reveals their clinical significance and underscores the multifaceted action of the combined therapy.

Table 1: General data comparison.

Characteristic	Observation group (n=60)	Control group (n=60)	P value
Gender (male/female)	28/32	31/29	0.584
Age (year)	48.70±9.51	48.43±8.99	0.875
BMI (kg/m ²)	23.79±1.52	23.98±1.23	0.461
Disease duration (year)	6.08±2.15	6.33±1.69	0.481

Table 2: Comparison of TCM symptom scores before and after treatment.

Symptom	Time	Observation group (n=60)	Control group (n=60)	P value
Preference for warmth and pressure	Before treatment	3.73±0.94	3.80±0.95	0.700
	After treatment	0.77±0.98*	1.13±1.00*	0.045
Epigastric fullness or dull pain	Before treatment	4.28±1.08	4.17±0.76	0.494
	After treatment	0.87±1.00*	1.77±0.65*	<0.001
Loose stool	Before treatment	3.87±0.96	3.70±0.81	0.307
	After treatment	0.93±1.01*	1.87±0.50*	<0.001
Fatigue	Before treatment	3.20±1.12	3.27±1.10	0.743
	After treatment	1.00±1.01*	1.73±0.78*	<0.001
Shortness of breath and lassitude	Before treatment	3.47±0.96	3.40±0.99	0.710
	After treatment	0.78±1.00*	1.73±0.86*	<0.001
Poor appetite	Before treatment	3.82±1.00	3.67±0.84	0.375
	After treatment	0.87±1.00*	1.93±0.63*	<0.001

Note: *: There was a statistically significant difference compared with Before treatment.

Table 3: Comparison of PGI and GAS before and after treatment.

Parameter	Time	Observation group (n=60)	Control group (n=60)	P value
PGI (ng/mL)	Before treatment	129.07±29.76	128.30±32.11	0.893
	After treatment	60.58±10.02*	83.95±22.14*	<0.001
GAS(pg/mL)	Before treatment	95.08±9.17	96.15±10.11	0.543
	After treatment	120.10±16.63*	105.57±13.28*	<0.001

Note: *: There was a statistically significant difference compared with Before treatment.

Table 4: Comparison of gastroscopy score and GSRS score before and after treatment.

Index	Time	Observation group (n=60)	Control group (n=60)	P value
Gastroscopy score	Before treatment	2.47±0.57	2.48±0.68	0.884
	After treatment	0.80±0.40*	1.45±0.50*	<0.001
GSRS score	Before treatment	88.95±11.05	85.13±10.86	0.684
	After treatment	28.13±5.18*	45.17±6.62*	<0.001

Note: *: There was a statistically significant difference compared with Before treatment.

The significant decrease in PGI levels in the observation group (60.58 ± 10.02 ng/mL) compared to the control group (83.95 ± 22.14 ng/mL) is conventionally interpreted as a sign of reduced mucosal inflammation, as PGI can elevate during mucosal irritation (Samloff *et al.*, 1982). However, the clinical narrative is more nuanced. While a marked elevation in PGI is associated with inflammation, a profound and progressive decline is a well-established serological hallmark of gastric atrophy (Fang *et al.*, 2013). Therefore, the ideal therapeutic outcome is not necessarily the lowest possible PGI level, but rather its normalization. The reduction observed in our study, which brought PGI levels closer to the normal range without collapsing them,

is highly suggestive of a resolution of the acute inflammatory state. This pattern aligns with findings from other TCM intervention studies that report a "modulating" effect (Yan *et al.*, 2019), but contrasts with the dramatic PGI suppression seen in progressive atrophy, highlighting the context-dependency of this biomarker.

The more pronounced elevation of GAS in the combination group (120.10 ± 16.63 mg/mL vs. 105.57 ± 13.28 mg/mL) is a pivotal finding. GAS stimulates gastric acid secretion and promotes mucosal growth (Copps *et al.*, 2009), resonating with the TCM concept of "warming the middle-jiao." This moderate increase can be construed as

beneficial, reflecting improved functional capacity of the gastric mucosa, potentially stimulated by tonic herbs like *Dangshen* (Wang *et al.*, 2020). However, the broader literature also sounds a note of caution, as chronic hypergastrinemia in the setting of gastric atrophy is a recognized risk factor for neuroendocrine tumors (Shah *et al.*, 2021). The critical distinction lies in the functional context. The GAS elevation in our cohort occurred alongside improved mucosal appearance and reduced PGI, indicating an environment of functional recovery and repair, not progressive atrophy. This pattern of "restorative gastrinemia" has been observed in other repair-phase models, distinguishing it from the pathological elevation in atrophic gastritis (Dockray, 2014).

Distinct roles and synergistic mechanisms of Woxuan Needling and Xiangsha Liujunzi Decoction

A key question arising from our findings is how the contributions of Woxuan needling and Xiangsha Liujunzi decoction differ and interact. We propose a mechanistic model wherein each therapy targets distinct yet complementary physiological pathways.

The distinct role of Woxuan needling: A neuromodulatory intervention

The primary role of Woxuan needling appears to be that of a systemic regulator and neuromodulator. Its distinct functions likely include: (1) Normalizing Gastrointestinal Motility by modulating vagal nerve activity (Li *et al.*, 2021); (2) Regulating Neuroendocrine Secretion, as evidenced by the significant GAS upregulation, potentially through central and autonomic pathways (Zhang *et al.*, 2022) and (3) Modulating Visceral Sensitivity by altering central pain processing (Wang *et al.*, 2021).

The distinct role of Xiangsha Liujunzi decoction: A pharmacological intervention

In contrast, the role of Xiangsha Liujunzi decoction is primarily local and pharmacological, acting directly on the gastric mucosa. Its unique contributions are: (1) Direct anti-inflammatory Action via bioactive compounds that suppress pro-inflammatory cytokines such as interleukin-6 (IL-6) and interleukin-17 (IL-17) (Zhang, 2017; Zhang *et al.*, 2022); (2) Promotion of Mucosal Repair by upregulating key proteins like trefoil factor 1 (TFF1) (Gao *et al.*, 2017; Li *et al.*, 2021); and (3) Local immunomodulation to reduce immune-mediated damage (Wang *et al.*, 2020).

The emergence of synergy

The synergy observed arises from the effective integration of these distinct roles. We hypothesize that Woxuan needling creates an optimized internal milieu by regulating systemic neural and endocrine functions, which may potentiate the efficacy of Xiangsha Liujunzi decoction. For instance, improved microcirculation and motility could enhance herbal delivery. Conversely, the decoction's local actions stabilize the peripheral environment, facilitating a

more sustained regulatory response from acupuncture. This "acupuncture-medicine synergy" exemplifies the TCM principle of regulating the whole body (via needling) while treating the local lesion (via herbs).

Limitations and future perspectives

This study has several inherent methodological limitations that must be critically appraised to accurately interpret the findings and guide future research. We move beyond superficial acknowledgment to provide a candid reflection on how these weaknesses may have influenced our results.

The randomization process, based on a random number table applied sequentially at enrolment, constitutes quasi-randomization rather than true allocation concealment. This method is susceptible to selection bias, as investigators could potentially predict or influence the group assignment of subsequent participants. Coupled with the convenience sampling from a single center, this fundamentally limits the internal and external validity of our trial. The sample likely represents a specific, accessible subpopulation within a tertiary hospital, which may not be representative of the broader patient community. While our baseline group comparisons (Table 1) showed no significant differences—suggesting successful randomization in this instance—this does not negate the inherent weakness of the method. Future studies must implement a centralized, computer-generated randomization sequence with full concealment until assignment to eliminate this potential bias and strengthen causal inference.

The double-blind design was effectively maintained for outcome assessors and data analysts. However, blinding of participants and practitioners to the acupuncture intervention was impossible. This introduces a high risk of performance bias and placebo effects attributable to the acupuncture procedure itself. Patients in the observation group received additional, specific attention and a procedural intervention, which alone can influence subjective symptom reporting (GSRS and TCM scores) and potentially even objective biomarkers through psychoneuroimmunological pathways (Moraes *et al.*, 2018). To isolate the specific physiological effects of Woxuan needling from its potent contextual effects, subsequent RCTs should employ a sham acupuncture control (e.g., non-penetrating needles at non-acupoints) for the control group.

Our discussion on mechanisms remains speculative. The measured biomarkers (PGI, GAS) are downstream correlates and we lack direct evidence to support the proposed neuromodulatory or molecular pathways. The claim of "synergy" is inferred from superior outcomes in the combination group, but the design cannot delineate whether the interaction is synergistic, additive, or merely that both therapies are independently effective. Future studies incorporating autonomic function indices, inflammatory cytokine panels and gastric mucosal

molecular profiling will be essential for validating these proposed pathways.

The sample size, while sufficient for the primary outcomes, limits robust subgroup analyses. Furthermore, the single-center, convenience sample restricts the generalizability of our findings to other healthcare settings and diverse demographic groups. A definitive, multi-center trial with a larger, strategically sampled cohort is necessary to confirm efficacy and explore heterogeneity of treatment effects.

By confronting these methodological limitations directly, we aim to provide a transparent framework for interpreting our results and to establish a rigorous foundation for the next generation of clinical and mechanistic studies in this field.

CONCLUSION

In conclusion, the combined therapy of Woxuan needling and Xiangsha Liujunzi decoction is a highly effective strategy for chronic non-atrophic gastritis. The clinical benefits are underpinned by a plausible synergy that bridges TCM principles and biomedical science: Woxuan needling acts as a systemic neuromodulator, while Xiangsha Liujunzi decoction provides local pharmacological actions, together normalizing motility, regulating neuroendocrine function, exerting anti-inflammatory effects and promoting mucosal repair. This study provides a robust clinical and serological foundation for this integrated approach and the critically identified limitations provide a clear roadmap for future mechanistic exploration.

Acknowledgments

Not applicable.

Author's contributions

Yiting Du: Conceptualization, methodology, resources, writing - original draft preparation, writing - review and editing, project administration and supervision; Yong Yu: Methodology, investigation and writing - review and editing; Boyang Wei: Formal analysis, investigation, data curation, writing - review and editing and visualization.

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Data availability statement

The datasets generated during and/or analysed during the current study are not publicly available due to patient privacy but are available from the corresponding author on reasonable request.

Ethical approval

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Jiangxi Province Hospital of Integrated

Chinese and Western Medicine [No. Yanlunwenpi (003)]. All enrolled patients provided signed informed consent. This study was performed in adherence with the CONSORT guidelines. See supplementary file for the CONSORT checklist.

Conflict of interest

The authors declare no conflict of interest.

Trial registration

This trial was registered retrospectively on 14/08/2026 with registry number ISRCTN52976333. The first participant was enrolled on 10/01/2022. Ethical approval was obtained on 26/12/2021.

Editorial Note

This trial was registered retrospectively (after participant enrollment began). The journal has verified that prospective ethical approval was obtained from the authors' Institutional Review Board on 26/12/2021. The authors have provided justification for delayed registration. Readers are advised to interpret the findings with awareness of this limitation.

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