

Research Progress on Traditional Chinese Medicine Treatment of Inflammation-to-Cancer Transformation

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Abstract: *Precancerous Lesions of Gastric Cancer (PLGC) constitute a critical stage in the development and progression of gastric carcinoma. Modern medicine lacks specific therapeutic agents for PLGC, whereas Traditional Chinese Medicine (TCM) has demonstrated advantages in improving symptoms and reversing early-stage pathological changes. By reviewing relevant literature in recent years, this paper summarizes and analyzes the current research status of TCM interventions for PLGC from six aspects: etiology and pathogenesis, pattern differentiation and classification, herbal medicine therapy, and non-pharmacological therapies. It is concluded that the disease location of PLGC is in the spleen and stomach, with spleen deficiency as the root of the core pathogenesis and qi stagnation, phlegm turbidity, stasis, and toxin as the branch manifestations. Among the pattern differentiations, the spleen-stomach deficiency pattern is the most commonly observed. Furthermore, it has been confirmed that herbal medicine, as well as non-pharmacological therapies including acupuncture, moxibustion, and acupoint application, have demonstrated definitive efficacy in improving clinical symptoms, reversing gastric mucosal pathological changes, regulating the inflammatory-immune microenvironment, and blocking the "inflammation-cancer" transformation. In the future, high-quality multicenter randomized controlled trials are needed, combined with modern omics technologies, to further elucidate their mechanisms of action.*

Keywords: Precancerous Lesions of Gastric Cancer (PLGC), Chronic Atrophic Gastritis (CAG), Traditional Chinese Medicine (TCM), Non-Pharmacological Therapies.

1. Introduction

Chronic gastritis is a common chronic disease of the digestive system in clinical practice. Its core pathological feature is persistent inflammation of the gastric mucosa. The disease has a prolonged course and a tendency to relapse. In some patients, the presence of precancerous lesions may lead to the development of gastric cancer. Precancerous Lesions of Gastric Cancer (PLGC) constitute a critical stage in the progression of gastric carcinoma [1], encompassing chronic atrophic gastritis (CAG), intestinal metaplasia (IM), and dysplasia (Dys) [2]. The incidence and mortality rates of gastric cancer rank among the top three of all malignancies [3]. Its early symptoms are atypical and resemble those of dyspepsia, often leading to patient neglect. Consequently, most patients are already at a middle or advanced stage at the time of diagnosis. Since PLGC is a pivotal phase in the development and progression of gastric cancer, early identification and effective intervention have become one of the core strategies for blocking gastric carcinogenesis and reducing its incidence. Currently, modern medicine can perform early cancer screening through endoscopic techniques combined with mucosal biopsy, which can, to some extent, delay or prevent further deterioration of the condition, and provide endoscopic treatment at the stage of high-grade intraepithelial neoplasia. However, specific therapeutic agents are often lacking for PLGC, and treatment tends to focus on symptomatic management and alleviation of symptoms [4], making it difficult to reverse PLGC. In contrast, Traditional Chinese Medicine (TCM), with its advantages of multi-pathway, multi-target, and low-toxicity treatment [5], has demonstrated unique potential in the prevention and treatment of PLGC. This study aims to systematically summarize the therapeutic strategies of TCM interventions for

PLGC, with the goal of providing clinical insights for its TCM prevention and treatment.

2. Etiology, Pathogenesis, and Pattern Differentiation and Classification

2.1 Etiology and Pathogenesis

In Traditional Chinese Medicine (TCM), although there is no specific disease name that directly corresponds to PLGC, based on its clinical manifestations, it can be classified into the categories of "epigastric pain", "gastric stuffiness", and "epigastric discomfort with restlessness". The disease location is in the spleen and stomach. The etiological factors are mostly external pathogenic invasion, improper diet, emotional dysregulation, constitutional insufficiency, and damage from drugs or toxins. The main pathogenesis involves spleen deficiency, qi stagnation, dampness turbidity, blood stasis, and toxic damage. The nature of the disease is root deficiency and branch excess, with spleen-stomach deficiency as the root, and qi stagnation, phlegm-turbidity, and blood stasis as the branch. Spleen deficiency and qi weakness impair transportation and transformation, leading to unsmooth qi and blood circulation, internal generation of phlegm-turbidity, qi stagnation, accumulation of blood stasis, gradual generation of toxic pathogen, and ultimately carcinogenesis. In terms of treatment, TCM commonly approaches this disease by invigorating the spleen and harmonizing the stomach to strengthen healthy qi, and regulating qi and activating blood to dispel pathogenic factors.

Through long-term clinical practice and drawing inspiration from the thoughts of physicians throughout the ages, modern TCM practitioners have developed unique understandings of

the etiology of this disease. Li Runtian et al. believe that the core pathogenesis of PLGC is “the loss of Taiyin”, and thus intervene in the inflammation-cancer transformation by regulating the ascending and descending through opening Taiyin [6]. Professor Wu Wenyao proposes that the core pathogenesis is “qi-stateqi disorder”, and therefore treats PLGC from the perspective of regulating the homeostatic state of qi [7]. National Master of Traditional Chinese Medicine, Professor Ma Jun, advanced the theory of “Harmonizing the middle jiao method”, and follows the principle of combining rigidity and flexibility in treating basic spleen and stomach diseases [8]. Professor Zhang Shengsheng summarized the pathogenesis of this disease as “deficiency, turbidity, stagnation, stasis, toxin, and zheng”, and proposed the therapeutic method of “Tiaotai Xiaozheng”. He holds that spleen-stomach deficiency is the onset of the disease, and takes “regulating the deficient state” as the prerequisite to restore the source of qi and blood [9].

2.2 Pattern Differentiation and Classification

The 2025 Expert Consensus on the Integrated Traditional Chinese and Western Medicine Diagnosis and Treatment of Chronic Atrophic Gastritis indicates that the TCM patterns of this disease can be classified into six types: Liver-Stomach Qi Stagnation Pattern, Liver-Stomach Depressive Heat Pattern, Spleen-Stomach Damp-Heat Pattern, Stomach Collateral Stasis Obstruction Pattern, Spleen-Stomach Deficiency Pattern, and Stomach Yin Insufficiency Pattern [10]. Chen Jiamin et al. observed 286 patients with CAG and found that the top three most frequently distributed patterns were: Spleen-Stomach Qi Deficiency Pattern, Stomach Collateral Blood Stasis Pattern, and Liver-Stomach Qi Stagnation Pattern [11]. Wang Yue et al. analyzed 268 patients with CAG and reported that the most commonly distributed pattern was Spleen-Stomach Deficiency Pattern [12]. Zhang Ruifen et al., through a retrospective analysis, found that the TCM pattern with the highest proportion in CAG was Spleen-Stomach Deficiency Pattern [13]. It can be seen from this that the basis for the onset of PLGC is insufficiency of spleen and stomach function, consistent with the statement in the Treatise on the Spleen and Stomach: “All diseases arise from the decline of the spleen and stomach.”

3. Traditional Chinese Medicine Treatment for PLGC

3.1 Treatment with Classical Formulas

Classical formulas, as the source and living water of TCM formulary, have been clinically validated over millennia and occupy an important position in the treatment of digestive system diseases. Numerous renowned classical formulas have been widely applied in clinical and experimental studies on PLGC. Their mechanisms of action, mediated through multi-target and multi-pathway regulation of the gastric mucosal microenvironment, are attracting increasing attention.

“On the fifth or sixth day of Taiyang disease, when vomiting and fever are present, the pattern of Chaihu Decoction is complete; if another purgative has been administered but the Chaihu pattern still remains, then Chaihu Decoction is again indicated. Although a purgative has been given, this is not an

error... but if there is only fullness without pain, this is aPi; Chaihu is not appropriate, and Banxia Xiexin Decoction should be used.” Banxia Xiexin Decoction, first recorded in the Treatise on Cold Damage and Miscellaneous Dis-eases, is one of the common classical formulas for digestive system diseases. Li Jingjie et al. [14] conducted a clinical observation of 60 patients with PLGC presenting with a cold-heat complex glomus pattern complicated by *Helicobacter pylori* infection. The patients were divided into an observation group and a control group. The observation group received Banxia Xiexin Decoction combined with standard triple therapy for *H. pylori* eradication, while the control group received triple therapy alone. The results showed that the observation group had significantly greater improvements in atrophy, intestinal metaplasia, clinical symptoms, and C14 values compared with the treatment group. Sijunzi Decoction was first recorded in the Formulary of the Taiping Huimin Heji Ju Fang and is composed of pattern, Poria, *Atractylodes Macrocephalae*, and *Glycyrrhizae Radix et Rhizoma Praeparata cum Melle*. Modern studies have shown that the PI3K/AKT signaling pathway participates in cell proliferation, apoptosis, transformation, and energy metabolism, thereby regulating tumor development and progression, and thus plays an important role in the formation of gastric cancer [15]. Relevant studies indicate that Sijunzi Decoction can intervene in the progression of the inflammation-cancer transformation by inhibiting the PI3K/AKT signaling pathway. Dong Yunxia [16] selected 92 patients with chronic gastritis of the liver-stomach disharmony pattern, dividing them into a control group and an intervention group. The control group received conventional Western medical treatment, while the intervention group additionally received modified Sini San (Frigid Extremities Powder). The results showed that the intervention group had a higher effective rate than the control group. Peng Chujie et al. [17] conducted pharmacological research on Sini San and found that it treats PLGC by inhibiting the growth of gastric cancer cells, improving cellular hypoxia tolerance, and suppressing angiogenesis. Liang Yuhua et al. [18] enrolled 98 patients with CAG. The control group received conventional Western medical treatment, while the observation group additionally received modified Huangqi Jianzhong Decoction. The results showed that after treatment, the observation group had greater symptomatic improvement and lower endoscopic pathological scores compared with the control group. Modern pharmacological studies have found [19] that *Astragali Radix*, as the main ingredient in Huangqi Jianzhong Decoction, is rich in amino acids and flavonoids, which can promote gastrointestinal motility, repair the gastric mucosa, and improve gastrointestinal function. Erchen Pingwei San can invigorate the spleen and transform dampness, while also regulating qi and harmonizing the stomach. It is often used for digestive tract diseases due to spleen-stomach dampness obstruction. Chen Zhijian et al. [20] found that Erchen Pingwei San was significantly superior to conventional Western drugs in improving inflammatory cytokine levels and serum gastrointestinal hormones.

3.2 Self-made Decoction

Self-made Decoction are based on clinicians' individualized understanding of the core pathogenesis of PLGC, fully embodying the TCM characteristics of “treatment based on

pattern differentiation” and “formulas following the pattern established”. Numerous clinicians, integrating regional characteristics and clinical experience, have developed distinctive pattern differentiation and treatment systems as well as effective formulas, providing substantial practical support for the TCM treatment of PLGC.

“Tiaozhong Xiaowei Formula” is a self-made decoction of Professor Shi Zhaohong, which has been applied in the treatment of PLGC for many years. Drawing on long-term clinical experience, Professor Shi proposed that the development of PLGC encompasses three major aspects: liver depression, spleen deficiency, and blood stasis. Based on this pathogenesis, she established three major treatment principles: supplementing deficiency without forgetting to soothe the liver, invigorating the spleen without departing from activating blood, and incorporating Western medicine without forsaking TCM [21]. Professor Tian Yaozhou posits that the pathogenesis of GAC is spleen-stomach qi deficiency with intermingled dampness and stasis. He adopts the treatment philosophy of “supplementing qi and transporting the spleen, gentle supplementation and gentle transportation, dispelling stasis and unblocking collaterals, and incorporating supplementation within unblocking.” Combined with his clinical experience, he created the Shidan Formula for the treatment of CAG of the qi deficiency and dampness-stasis pattern, which can improve clinical symptoms, prevent mucosal carcinogenesis, and reverse mucosal atrophy [22]. National Master of Traditional Chinese Medicine, Professor Zhang Zhen, believes that the fundamental pathogenesis of GAC is qi dynamic disorder. He advocates “one body with two wings, regulating and smoothing qi movement” as the core treatment principle, and developed the self-formulated Shu Tiao Qi Ji Decoction as the base formula to soothe the liver, harmonize the stomach, regulate the spleen, and regulate qi movement [23]. Jianpi Huayu Jiedu Decoction is a proven formula developed by Professor Pan Huafeng’s team for the treatment of PLGC. Derived from Sijunzi Decoction, it has the effects of invigorating the spleen and regulating qi, transforming stasis and resolving toxin. Through animal experiments, the team verified that this formula may exert its therapeutic effect on PLGC by inhibiting macrophage pyroptosis [24].

3.3 Chinese Patent Medicines

Chinese patent medicines, due to their fixed formulations, convenient administration, and definitive therapeutic effects, possess unique advantages in the long-term intervention of PLGC. In recent years, numerous clinical and experimental studies have focused on representative Chinese patent medicines such as Weifuchun, Zhizhu Kuanzhong Capsules, and Moluodan, preliminarily confirming their positive effects in reversing gastric mucosal pathological changes, regulating the inflammatory microenvironment, and improving gastrointestinal function.

Weifuchun is a Chinese patent medicine developed by Hu Qing Yu Tang, composed of Ginseng Radix et Rhizoma Rubra, Isodon amethystoides (Benth) Hara, and stir-frying Fructus Aurantii with bran, among others. It has the effects of invigorating the spleen and regulating qi, as well as activating blood and transforming stasis. It is widely used clinically in

the treatment of GAC, PLGC, and as adjuvant therapy after gastric cancer surgery. Network pharmacological analysis indicates that Weifuchun may inhibit the inflammation-cancer transformation of GAC by regulating the expression of tumor-related genes such as TP53, AKT1, and PTGS2, as well as inflammatory cytokines including IL-1 β , IL-6, and TNF- α [25]. Zhizhu Kuanzhong Capsules are formulated with Atractylodis Macrocephalae, Fructus Aurantii, Bupleuri Radix, and other ingredients. They have the actions of harmonizing the stomach and invigorating the spleen, eliminating glomus and regulating qi. They can enhance immunity, exert anti-inflammatory effects, and possess anti-inflammatory and anti-tumor activities [26]. Qiao Mei et al. [27] observed 80 patients with GAC complicated by *Helicobacter pylori* positivity. The control group received quadruple therapy, while the observation group additionally received Moluodan and folic acid. The results showed that quadruple therapy combined with Moluodan and folic acid could reduce the levels of inflammatory cytokines in GAC patients with *H. pylori* infection, improve the eradication rate of *H. pylori*, and enhance clinical efficacy.

4. Non-Pharmacological Therapies for PLGC

In addition to oral administration of Chinese herbal medicine, non-pharmacological therapies such as acupuncture therapy (Zhen Jiu), moxibustion (Ai Jiu), and Acupoint Application Therapy (Xue Wei Fu Tie) have also demonstrated unique advantages in the intervention of PLGC. These therapies, grounded in the theory of meridians and acupoints (Jing Luo Xue Wei), regulate visceral function and improve the gastric mucosal microenvironment through physical or medicinal stimulation. They are characterized by direct action and few adverse reactions, and have attracted increasing clinical attention in recent years.

Acupuncture therapies include conventional filiform needle acupuncture, electroacupuncture, fire needle, catgut embedding therapy (Xue Wei Mai Xian), and warming-needle moxibustion (Wen Zhen Jiu), among other modalities. Shao Xiaoxue et al. [28], building upon Professor Shan Qiuhua’s established “Shan’s Method of Soothing the Liver and Regulating the Spirit”, innovated and developed the “Jian Pi Shu Gan Tiao Shen Fa” to alleviate symptoms and reverse intestinal metaplasia. Yang Xiaoxuan et al. [29], through a self-controlled before-after study of 30 patients with GAC, found that after treatment, patients’ symptoms and histopathological scores were significantly reduced. Acupoint application, which combines medicinal therapy with acupoint stimulation, is an extended form of acupuncture therapy [30]. Wang Jiajia et al. [31] observed in a clinical study that acupuncture combined with acupoint application significantly improved patients’ inflammatory levels, oxidative stress levels, and gastrointestinal function. Gong Chen et al. [32] divided 60 patients with GAC into a control group and a treatment group. The control group received clarithromycin combined with Wenweishu Capsules, while the treatment group received umbilical therapy application combined with warming-needle moxibustion. After 12 weeks of treatment, the treatment group showed significantly superior outcomes in both clinical symptoms and pathological changes compared with the control group. As recorded in the Ling Shu · Guan Neng: “What acupuncture cannot achieve, moxibustion is

appropriate for.” The thermal penetration of moxibustion is deep, and its action is gentler and more sustained, making it particularly suitable for the treatment of cold pattern, deficiency pattern, and internal organ disorders. Studies have shown that moxibustion at the acupoints “Zhongwan” (CV12) and “Zusanli” (ST36) has significant therapeutic effects on gastric diseases [33].

Non-pharmacological therapies, represented by acupuncture, moxibustion, and acupoint application, can exert therapeutic effects through multi-target regulation of the neuro-immune-endocrine network, improving gastric mucosal blood supply and reparative capacity. They show promising prospects in the alleviation of clinical symptoms and pathological reversal of PLGC.

5. Summary

PLGC, as the “window period” in the development and progression of gastric cancer, represent a critical juncture for blocking the carcinogenic process. Although modern medicine has made some progress in the monitoring and endoscopic treatment of PLGC, it still lacks specific therapeutic agents capable of reversing gastric mucosal pathological changes. TCM, with its unique theoretical system of holistic concept and treatment based on pattern differentiation, as well as its therapeutic advantages of multi-pathway, multi-target action and low toxicity, has demonstrated irreplaceable potential in the long-term intervention of PLGC. A systematic review reveals that a relatively comprehensive academic framework has been established for the TCM prevention and treatment of PLGC.

However, research in this field still faces numerous challenges. Most clinical studies are single-center, small-sample observations lacking rigorous randomized double-blind controlled designs, and the level of evidence requires improvement. Existing mechanistic studies are mostly confined to the level of animal experiments. Furthermore, research on the operational standards and dose-response relationships of non-pharmacological therapies is still in its infancy.

In the future, efforts should be directed toward conducting high-quality, multicenter, large-sample, randomized controlled clinical trials. By leveraging cutting-edge technologies such as network pharmacology, single-cell sequencing, and spatial transcriptomics, the molecular mechanisms underlying compound formulas and acupuncture interventions should be further elucidated from the perspective of systems biology, thereby enabling TCM to play a greater role in the precise prevention and treatment of PLGC.

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