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A Review of the Clinical Application of Traditional Chinese Medicine in the Adjuvant Treatment of Gastric Cancer

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Abstract. Gastric cancer is a common malignant tumor with high incidence and mortality rates worldwide. Clinical treatment mainly relies on surgery and chemotherapy, both of which can cause significant adverse reactions and impair patients' quality of life.. As a distinctive complementary and alternative therapy, traditional Chinese medicine (TCM) has been widely used in the adjuvant treatment of gastric cancer due to its advantages in attenuating toxicity, enhancing efficacy, and improving patients' clinical symptoms. Focusing on the adjuvant treatment of gastric cancer, this review systematically summarizes the clinical application of TCM decoctions during the postoperative and chemotherapy periods. It also clarifies the value of acupuncture and moxibustion in alleviating chemotherapy-related adverse reactions and regulating patients' digestive and neurological functions. By summarizing the clinical efficacy and application characteristics of TCM in the adjuvant treatment of gastric cancer, this paper analyzes current problems in relevant research, such as the lack of standardized research designs and imperfect individualized treatment regimens. Finally, it outlines the development direction of TCM in the field of gastric cancer adjuvant therapy, indicating that future research should focus on establishing standardized diagnosis and treatment models and exploring individualized treatment models combined with modern medical technologies.

Keywords: traditional Chinese medicine, gastric cancer, adjuvant therapy, acupuncture and moxibustion, attenuating toxicity and enhancing efficacy

1. Introduction

As a malignant tumor originating from gastric mucosal epithelial cells, gastric cancer ranks among the top in incidence and mortality among malignant tumors globally, posing a severe threat to human health [1-5].

Current clinical treatment for gastric cancer centers on surgery, supplemented by comprehensive therapies such as chemotherapy, targeted therapy, and immunotherapy. However, surgical trauma often causes gastrointestinal dysfunction and decreased physical fitness in patients. Meanwhile, chemotherapeutic drugs induce a series of adverse reactions such as nausea and vomiting, myelosuppression, and cancer-related fatigue [6].

These conditions not only hinder the smooth progress of treatment but also reduce patients' quality of life. In the field of oncology treatment, TCM has established a unique theoretical system

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and therapeutic methods based on core concepts such as "holistic view" and "treatment based on syndrome differentiation". Its application in the adjuvant treatment of gastric cancer has gradually gained recognition in the clinical community [7].

"Existing research indicates that TCM exerts multiple effects in adjuvant gastric cancer treatment, including accelerating postoperative recovery, mitigating chemotherapy-induced adverse reactions, and enhancing immune function [1]."

However, current research on TCM in gastric cancer adjuvant therapy has some limitations, such as insufficient high-quality clinical studies, unclear mechanisms of some formulas, and non-standardized clinical application [3].

Against this research background and gaps, this review systematically sorts out the current clinical application status of TCM decoctions and acupuncture-moxibustion in gastric cancer adjuvant therapy, summarizes their clinical efficacy and application characteristics, analyzes existing problems, and proposes future development directions [2].

Using literature review and systematic induction, this study collates and analyzes domestic and foreign literature on the application of TCM in gastric cancer adjuvant therapy in recent years, aiming to provide a more comprehensive and standardized reference for its clinical application and promote better integration of TCM and modern medicine in gastric cancer treatment [4].

2. Clinical application of TCM in the adjuvant treatment of gastric cancer

TCM adjuvant therapy for gastric cancer is administered syndrome differentiation,with individualized regimens tailored to patients' treatment stages and physical conditions. Its core therapeutic effects are mainly reflected in promoting the recovery of bodily functions, relieving adverse reactions, and improving patients' overall conditions [8].

Chemotherapy is a critical adjuvant and palliative treatment modality for locally advanced and metastatic gastric cancer. Yet chemotherapeutic drugs tend to damage normal tissues alongside tumor cells, frequently causing digestive, hematopoietic and immune dysfunctions, which become major barriers to sustained treatment [6].

In TCM theory, chemotherapy-related toxic reactions are categorized as "drug toxicity", which impairs the spleen and stomach, depletes qi and blood, and results in insufficient healthy qi and lingering pathogenic toxins [7]. Accordingly, the main therapeutic principles are reinforcing the spleen and regulating the stomach, tonifying qi and nourishing blood, as well as clearing heat and detoxifying [1].

Commonly used prescriptions include modified Sijunzi Decoction, Bazhen Decoction and Liu Junzi Decoction [8]. Clinical evidence demonstrates that TCM intervention can effectively alleviate chemotherapy-induced adverse reactions such as nausea, vomiting, myelosuppression, and fatigue, improve patients' chemotherapy tolerance, stabilize immune function, and facilitate completion of the planned treatment regimen [1].

TCM clinical application during gastric cancer chemotherapy adheres to syndrome differentiation, with corresponding regimens formulated according to different types of adverse reactions and syndromes [7]. Common clinical syndromes include spleen-stomach qi deficiency, dual deficiency of qi and blood, spleen-stomach damp-heat, and liver-stomach disharmony [9]. Spleen-stomach qi deficiency syndrome manifests as nausea and vomiting, anorexia, abdominal distension and loose stools, and lassitude, treated with prescriptions such as Sijunzi Decoction and Xiangsha Liujunzi Decoction focusing on invigorating the spleen, harmonizing the stomach, and descending rebellious qi to stop vomiting [1].

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Dual deficiency of qi and blood syndrome often arises from chemotherapy-induced myelosuppression, presenting with leukopenia, anemia, fatigue, pale complexion, and dizziness. It is managed with formulas such as Bazhen Decoction and Shiquan Dabu Decoction, which focus on replenishing qi, nourishing blood, tonifying the kidney, and filling the marrow [8].

Spleen-stomach damp-heat syndrome presents with a bitter taste in the mouth, dry throat, nausea, bilious vomiting, abdominal distension, and sticky stools. It is treated with formulas such as Zuojin Pills and Banxia Xiexin Decoction to clear damp-heat and harmonize the middle jiao [9]. Liver-stomach disharmony syndrome features chest and hypochondriac distension and pain, acid regurgitation, belching, and irritability, modified from Chaihu Shugan Powder combined with Zuojin Pills to soothe the liver, regulate qi, harmonize the stomach, and stop vomiting [7].

In addition to modified classic prescriptions, various Chinese patent medicines are widely used in adjuvant therapy during gastric cancer chemotherapy, such as Huachansu Capsules for clearing heat and toxins, Buxue Yijing Oral Liquid for replenishing qi and blood, and Weichangning Capsules for regulating the spleen and stomach [1]. These patent medicines are convenient to take with definite clinical efficacy, serving as adjuvant drugs for different syndromes [8].

A growing body of clinical evidence supports the role of TCM interventions during gastric cancer chemotherapy in effectively alleviating adverse reactions and enhancing patients' quality of life [1].

Firstly, in alleviating digestive reactions, TCM effectively reduces the incidence and severity of chemotherapy-induced nausea, vomiting, abdominal distension, diarrhea, and anorexia, thereby enhancing digestive and absorptive functions [6].

Secondly, in improving hematopoietic function, TCM prescriptions for replenishing qi, nourishing blood, tonifying the kidney and filling marrow effectively relieve chemotherapy-induced myelosuppression, increase white blood cells, red blood cells, and platelets, and reduce the risk of infection and bleeding caused by cytopenia [8].

Thirdly, TCM effectively alleviates cancer-related fatigue during chemotherapy, improves physical and mental status, and enhances chemotherapy tolerance [1]. Furthermore, TCM regulates immune function by increasing the number of immune cells such as T lymphocytes and natural killer cells, strengthening the body's anti-tumor immunity to achieve the effect of attenuating toxicity and enhancing efficacy [7].

3. Application of acupuncture and moxibustion in the adjuvant treatment of gastric cancer

As an important component of TCM, acupuncture and moxibustion are characterized by ease of application, definite efficacy, and few adverse reactions, and are widely used in the adjuvant treatment of malignant tumors, including lung cancer and gastric cancer [10]. Its core therapeutic effects are relieving chemotherapy adverse reactions, regulating bodily functions, and improving quality of life [2]. In gastric cancer adjuvant therapy, acupuncture-moxibustion is often combined with TCM decoctions or used alone as an adjuvant therapy to exert favorable synergistic effects [1].

3.1. Commonly used acupoints and operational characteristics of acupuncture-moxibustion

Acupoint selection for acupuncture-moxibustion in gastric cancer adjuvant therapy is based on TCM meridian theory and syndrome differentiation, mainly using acupoints of the spleen-stomach meridians, Foot-Yangming Stomach Meridian, Foot-Taiyin Spleen Meridian, and Ren Meridian as main points, combined with symptomatic matching points [10].

Commonly used main acupoints include Zusanli (ST36), Zhongwan (CV12), Neiguan (PC6), Pishu (BL20), Weishu (BL21), and Sanyinjiao (SP6) [2]. As the He-Sea point of the Foot-Yangming

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Stomach Meridian, Zusanli functions to invigorate the spleen, harmonize the stomach, replenish qi and nourish blood, serving as a key acupoint for regulating the digestive system and improving physical fitness [10]. Zhongwan, the Front-Mu point of the stomach, harmonizes the stomach, invigorates the spleen, relieves distension and pain, and is essential for treating gastric diseases [2]. Neiguan, the Luo-Connecting point of the Hand-Jueyin Pericardium Meridian, calms the mind, descends rebellious qi, and stops vomiting, commonly used to relieve nausea and vomiting [1]. Pishu and Weishu, Back-Shu points of the spleen and stomach, regulate spleen-stomach function upon stimulation [10]. Sanyinjiao, the intersection point of the three foot Yin meridians, replenishes qi, nourishes blood, and regulates the liver, spleen, and kidney [2].

In terms of operation, mild reinforcing methods are mostly adopted for tumor patients to avoid excessive stimulation to those with deficient vital qi [7]. Filiform needles are primarily used with even reinforcing-reducing manipulation, retained for 20 to 30 minutes, administered once daily or every other day [10]. Moxibustion mainly includes mild moxibustion and ginger-partition moxibustion applied to Zusanli, Zhongwan and other acupoints, using the warming effect to warm the spleen, harmonize the stomach, replenish qi and nourish blood [2]. Auricular point pressing is also a common clinical TCM therapy, selecting auricular points such as stomach, spleen, sympathetic nerve, and Shenmen, pressed with cowherb seeds for convenient self-operation and sustained regulatory effects [10].

3.2. Effects of acupuncture-moxibustion in alleviating chemotherapy-induced vomiting, pain, insomnia and fatigue

During the treatment of lung cancer and gastric cancer, chemotherapy induces common adverse reactions including vomiting, pain, insomnia and fatigue, which severely affect patients' quality of life [6]. Acupuncture-moxibustion has definite efficacy in relieving these reactions and has become an important clinical adjuvant therapy [10].

For chemotherapy-induced vomiting, acupuncture-moxibustion mainly stimulates Neiguan, Zhongwan, Zusanli, Geshu (BL17) and other acupoints to regulate gastrointestinal function and inhibit the vomiting center, reducing the incidence and severity of acute and delayed chemotherapy-induced vomiting [2]. Clinical studies show that acupuncture-moxibustion combined with antiemetic drugs achieves better antiemetic effects than single-drug use, while reducing the dosage and corresponding adverse reactions of antiemetics [1]. For pain relief, lung cancer and gastric cancer patients often suffer from cancer pain or pain caused by surgical trauma and chemotherapy [6]. Acupuncture-moxibustion stimulates Hegu (LI4), Neiguan, Zusanli, and Ashi points to unblock meridians, promote qi and blood circulation, and regulate the body's pain perception system for analgesia [10].

It can be used alone for mild to moderate cancer pain, and combined with analgesics for severe cancer pain to reduce drug dosage and dependence [2].

Regarding insomnia management, patients with lung or gastric cancer are prone to sleep disturbances due to chemotherapy-related adverse reactions, psychological stress, and physical discomfort [7].

Acupuncture-moxibustion stimulates Shenmen (HT7), Neiguan, Sanyinjiao, Baihui (GV20) and other acupoints to calm the mind and nourish the heart, prolonging sleep duration and improving sleep quality [10]. For fatigue relief, it stimulates Zusanli, Sanyinjiao, Pishu, Qihai (CV6) and other acupoints to replenish qi, nourish blood, and regulate the spleen and stomach, improving energy metabolism to alleviate cancer-related and chemotherapy-induced fatigue and enhance physical fitness and mobility [1].

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3.3. Application of acupuncture-moxibustion in improving appetite and gastrointestinal dysfunction

Gastrointestinal dysfunction symptoms such as anorexia, abdominal distension, constipation and diarrhea are common clinical manifestations in lung cancer and gastric cancer patients during treatment, mainly caused by chemotherapy-induced digestive system injury and spleen-stomach dysfunction [9]. Acupuncture-moxibustion regulates the digestive system and is widely used clinically to improve appetite and gastrointestinal dysfunction [10].

Core acupoints for improving appetite and gastrointestinal dysfunction include Zusanli, Zhongwan, Pishu, Weishu, and Sanyinjiao, with symptomatic matching points added according to patients' conditions [2]. Neiguan and Hegu are added for anorexia to regulate qi and harmonize the stomach; Tianshu (ST25) and Qihai for abdominal distension and qi stagnation to promote qi circulation and relieve distension; Zhigou (TE6) and Dachangshu (BL25) for constipation to moisten the intestines and relieve constipation; Yinlingquan (SP9) and Shuifen (CV9) for diarrhea to invigorate the spleen and eliminate dampness [10].

By stimulating meridians and acupoints, acupuncture-moxibustion regulates gastrointestinal peristalsis, improves gastrointestinal hormone secretion, enhances digestive and absorptive capacity, and effectively alleviates symptoms such as anorexia, abdominal distension, constipation and diarrhea [1].

Clinical practice shows that acupuncture-moxibustion interventions increase food intake and improve gastrointestinal function, laying a solid foundation for smooth tumor treatment and physical recovery [2]. In gastric cancer adjuvant therapy, the combination of acupuncture-moxibustion and TCM decoctions exerts synergistic effects in invigorating the spleen and harmonizing the stomach, demonstrating more prominent efficacy [10].

4. Problems and prospects

4.1. Deficiencies in current research

Although TCM has achieved prominent clinical efficacy in gastric cancer adjuvant therapy, existing relevant research still has several limitations, which restrict its further development and clinical application in gastric cancer treatment [3].

On the one hand, research designs are non-standard: most current studies are small-sample, single-center clinical observations lacking large-sample, multi-center, randomized, double-blind, placebo-controlled clinical trials, resulting in low credibility of results and difficulty in gaining recognition from the international medical community [4].

On the other hand, mechanism research is insufficient: current studies mainly focus on clinical efficacy observation, with inadequate research on the molecular mechanisms of TCM prescriptions and acupuncture-moxibustion in gastric cancer adjuvant therapy, such as in-depth studies on the regulation of tumor microenvironment, immune function and signaling pathways, failing to explain TCM therapeutic effects from a modern medical perspective [3].

Thirdly, there is a lack of standardized diagnosis and treatment guidelines for TCM in gastric cancer treatment [4]. Although TCM treatment is based on syndrome differentiation, there are large differences in syndrome differentiation and treatment regimens among different physicians [7]. The absence of unified and standardized syndrome differentiation criteria, clinical guidelines, and efficacy evaluation models leads to inconsistent clinical application and difficulty in large-scale popularization [3].

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Fourthly, individualized treatment regimens are not well-established: despite TCM advocating individualized treatment, current practice mostly relies on physicians' clinical experience without support from objective indicators and modern medical technologies, making it hard to formulate scientific and rational individualized regimens based on patients' genetic characteristics, tumor stages and physical conditions [4].

Lastly, the integration of TCM and modern medicine is insufficient: current application is mostly a simple superposition, lacking in-depth integration in diagnosis-treatment concepts, therapeutic methods and efficacy evaluation, failing to form a distinctive integrated traditional Chinese and Western medicine treatment model [3].

4.2. Future directions of standardized and individualized application

Given current research deficiencies, future applications of TCM in gastric cancer adjuvant therapy should focus on establishing standardized diagnostic and treatment models and exploring personalized treatment approaches to promote closer integration with modern medicine, thereby enhancing the clinical efficacy and scientific rigor of TCM adjuvant therapy [4].

Firstly, strengthen standardized clinical research: conduct large-sample, multi-center randomized controlled trials in accordance with international clinical research standards, formulate unified research protocols and efficacy evaluation criteria to enhance result credibility and international recognition, and attach importance to long-term follow-up to observe the long-term efficacy of TCM in improving survival rates and reducing tumor recurrence and metastasis [3].

Second, in-depth mechanistic research should be carried out: modern technologies such as molecular biology, immunology, and metabolomics should be integrated to further explore the mechanisms underlying TCM prescriptions and acupuncture-moxibustion, identify intervention targets and signaling pathways, and explain therapeutic effects from a modern medical perspective, thereby providing scientific evidence for clinical applicationn [4].

Thirdly, establish standardized diagnosis and treatment guidelines based on TCM theories, clinical practice and modern medical diagnostic technologies, formulating unified syndrome differentiation criteria, clinical guidelines and efficacy evaluation models for TCM adjuvant therapy of gastric cancer to standardize the clinical application of TCM prescriptions and acupoint selection, facilitating large-scale clinical popularization [3].

Next, actively explore individualized treatment models integrated with modern technologies: combine genetic testing, tumor molecular typing and other modern medical techniques, comprehensively considering patients' genetic characteristics, tumor stages, physical conditions and syndromes to formulate scientific and rational individualized TCM regimens, achieving precise TCM treatment in gastric cancer adjuvant therapy [4].

Lastly, promote in-depth integration of TCM and modern medicine: integrate Chinese and Western diagnosis-treatment concepts to establish an integrated model with surgery and chemotherapy as the core and TCM as adjuvant therapy, organically combining TCM's effects of attenuating toxicity, enhancing efficacy and improving quality of life with modern medicine's tumor cell-killing and progression-controlling functions [3]. Efforts should be made to strengthen the inheritance and innovation of TCM, excavate and sort classic prescriptions and clinical experience in TCM treatment of gastric cancer, conduct innovative research on TCM dosage forms, and develop clinically convenient and effective TCM injections, granules and capsules to enhance the clinical application value of TCM [4].

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5. Conclusion

Gastric cancer is a malignant tumor that seriously threatens human health [5].Clinical treatment is accompanied by obvious adverse reactions associated with surgery and chemotherapy, leading to a poor quality of life in patients [6]. As a distinctive complementary and alternative therapy, TCM has unique advantages and definite clinical efficacy in gastric cancer adjuvant therapy [1].

TCM decoctions guided by the principles of invigorating the spleen, harmonizing the stomach, replenishing qi and nourishing blood effectively promote postoperative rehabilitation, alleviate chemotherapy-induced digestive reactions, myelosuppression and other adverse reactions, and improve immune function and physical status [8]. Characterized by simple operation and few adverse reactions, acupuncture-moxibustion effectively relieves chemotherapy-induced vomiting, pain, insomnia, fatigue and other symptoms, increases appetite and improves gastrointestinal dysfunction, exerting favorable synergistic effects with TCM decoctions [10].

The integrated application of TCM decoctions and acupuncture-moxibustion has established a holistic adjuvant treatment model for gastric cancer, rooted in the core TCM principle of syndrome differentiation. This model achieves multiple therapeutic goals: reducing treatment-related toxicity, enhancing anticancer efficacy, regulating physiological functions, and significantly improving patients' quality of life [1].

With the continuous development of modern medical technology and advancement of TCM research, the clinical application of TCM in gastric cancer adjuvant therapy will become increasingly standardized and scientific, with continuous improvement in individualized and precise treatment [4]. TCM will play a more critical role in comprehensive gastric cancer treatment, providing more effective therapies to enhance clinical efficacy, reduce treatment-related adverse reactions, and improve patients' quality of life and survival rates [3]. The integration of traditional Chinese and Western medicine will become the main development trend of future gastric cancer treatment, bringing greater benefits to gastric cancer patients [2].

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