

# Theoretical Study of Sijunzi Tang in Nutritional Support of Gastrointestinal Tumors

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**Abstract:** *Gastrointestinal tumors are currently more common clinical tumors, and there is a large base of diseased people in China. As gastrointestinal tumors consume a great deal of the body in the process of disease development and after receiving treatment, patients often suffer from malnutrition, which leads to poor treatment tolerance and affects the quality of survival and prognosis of patients. The purpose of this paper is to explore the role played by Sijunzi Tang in nutritional support of gastrointestinal tumors and to analyze the prognosis of patients with gastrointestinal tumors. Combining modern medicine and traditional Chinese medicine, giving full play to the therapeutic advantages of traditional Chinese medicine, and applying the efficacy of Sijunzi Tang in benefiting qi and strengthening the spleen, we can provide further ideas for the promotion and application of improving the malnutrition status of patients with gastrointestinal tumors by improving the anti-tumor ability of the body, which can help in the early identification of interventions and management of chronic diseases of this kind of patients, as well as promote the research and development of the characteristic treatments of traditional Chinese medicine.*

**Keywords:** Sijunzi Tang, Gastrointestinal tumor, Nutritional support.

## 1. Current Status of Gastrointestinal Tumor Research and Development

With the sustained economic and social development, the standard of living has been gradually improved, and the corresponding dietary habits have undergone structural changes, which has led to the incidence of gastrointestinal-related diseases is also rising year by year. According to statistics, the number of new cases of colorectal cancer and gastric cancer ranked third and fifth in the world, and the number of deaths ranked second and fifth, respectively [1]. Colorectal cancer is currently one of the most common malignant tumors of the digestive tract in China, and in recent years, the incidence of colorectal cancer in the global population has been on an increasing trend [2]. Various factors such as irregular diet, *Helicobacter pylori* infection and heredity are important causes of stomach cancer. For the treatment of gastrointestinal tumors, surgery is preferred, and radiotherapy, chemotherapy, immunotherapy and targeted therapy are usually used as the main treatments for patients with intermediate and advanced stages. However, due to the trauma or depletion suffered by the patients during the treatment process, which leads to difficulties in eating, insufficient nutrient intake and malabsorption, malnutrition and other conditions to develop and further aggravate, and the immune function continues to drop dramatically [3].

## 2. Chinese Medical Understanding of Gastrointestinal Tumors

Chinese medicine believes that gastrointestinal tumors occur due to the deficiency of spleen qi, imbalance of yin and yang, and dysfunction of internal organs [4], and its pathogenesis is based on the weakness of spleen and stomach, with stagnation of qi, phlegm coagulation, blood stasis, and toxin conjugation as the markers, and the interaction between the present deficiency and the markers and the real ones, which are the cause of each other, and it is easy to exacerbate the damage to the positive qi of the organism in the course of treatment, so

that the clinical treatment should take supporting the positive and dispelling the evil as the main principles. It is mentioned in the *Jingyue Quanshu*: "Anyone who is deficient in the spleen and kidneys and who is weak and unbalanced is often afflicted with the disease of accumulation", innate insufficiency, viscera and internal organs are weak, the positive qi is weak, the spleen and stomach of the acquired dysfunction, the external evil invasion, and the mutual gelatinization, the accumulation of time into accumulation, into poly. Modern medical doctors believe that the pathogenesis of gastrointestinal tumors mainly includes five aspects: feeling external evils, dietary disorders, irregularity in daily life, unhealthy emotion and will and innate insufficiency, with a wide range of etiological factors, complexity of pathogenesis, and cross-influence of etiological factors, which triggers a variety of changes in etiology and mechanism. The research and summary of gastrointestinal tumors from the perspective of TCM etiology and mechanism by ancient and modern medical doctors have provided a good theoretical foundation for their subsequent diagnosis and treatment as well as further research.

## 3. Modern Medical Knowledge of Malnutrition Caused by Gastrointestinal Tumors

### 3.1 Current Status of Malnutrition Due to Gastrointestinal Tumors

Malnutrition is one of the common complications of gastrointestinal tumor patients in the stage of disease development, due to the lack of nutrition in the body leads to a decline in the patient's immunity, the risk of infection is increased, the patient's tolerance of treatment and quality of life is also reduced, the recovery of the systemic function has a greater impact on the short-term readmission rate and health care costs increase greatly [5], and malnutrition is also a major factor in the increase in mortality of patients with tumor. Studies have shown that malignant tumors are often accompanied by malnutrition [6], and the probability of

malnutrition in malignant tumors of the digestive system can be more than 85%, and the degree of malnutrition varies due to the individual's physical condition, different stages of disease development, and nutrient absorption status. For clinicians, not only should they focus on the treatment of gastrointestinal tumors, but also the treatment of malnutrition as a complication should not be delayed.

### 3.2 Gastrointestinal Tumors Cause Malnutrition

#### 3.2.1 The tumor itself affects

Due to the unlimited growth and proliferation of malignant tumor cells, a large amount of nutrients need to be absorbed, resulting in faster decomposition and metabolism in the body and lower synthesis of nutrients, which easily triggers a decline in nutritional status. The pro-inflammatory cytokines produced by malignant tumors will also cause neuroendocrine dysfunction, which will lead to patients' loss of appetite, reduced eating, and insufficient sources of nutrients, causing malnutrition [6]. In addition, gastrointestinal tumors can be complicated by anemia, hypoproteinemia, etc. In severe cases, they can cause abdominal metastasis, induce malignant ascites, intestinal obstruction, etc., and aggravate patients' malnutrition.

#### 3.2.2 Location of the tumor

Stomach and intestines are important parts of the human digestive system, and are the main sites of lesions in patients with gastrointestinal malignant tumors. When the tumor cells invade the epithelial cells of the gastrointestinal mucosa, leading to a decrease in its digestive and absorptive function, directly affecting the patient's dietary digestion and nutrient absorption [7].

#### 3.2.3 antitumor therapy

Side effects caused by the patient's surgery, as well as perioperative stress, increase energy and protein requirements, with a corresponding decrease in the body's ability to absorb nutrients. When treating tumors with chemotherapeutic drugs, they will also have a certain killing effect on normal tissues, causing the most common adverse reactions such as nausea, vomiting, fatigue, poor appetite, diarrhea, etc., and the patient's intake of food will be greatly reduced, and the body's nutrients are not enough to consume [8]. Targeted drugs may cause gastrointestinal perforation in patients, and patients in a fasting state can only rely on intravenous fluids to supplement nutrients to maintain life, which is far less than the variety of nutrients obtained from food, and malnutrition will only become more severe.

#### 3.2.4 Adverse psychological factors and negative emotions

Most of the tumor patients will be depressed, anxious, fearful and depressed after learning about their own conditions, especially those with economic difficulties, inharmonious family life and low cultural level, these adverse emotions are more obvious [9]. In the long run, patients do not think about eating, food intake is reduced, the peristalsis of the stomach slows down leading to a decline in absorption function, thus causing or aggravating malnutrition.

## 4. Knowledge and Application of Traditional Chinese Medicine to Nutritional Support of Gastrointestinal Tumors

In the writings in the field of Chinese medicine in China, there is no record of the name and concept of malnutrition caused by malignant tumors, but in the process of clinical diagnosis and treatment, it can be found that the clinical manifestations and treatments described in many articles can be matched with them, such as the Su Wen - Yu Ji Zhen Zang Lun(TCM) cloud: "The big bones are withered, the big flesh is sunken, ... ..die in six months". Chinese medicine for gastrointestinal malignant tumors caused by the body of the five organs of the cause of qi and blood malnutrition should belong to the theory of traditional Chinese medicine, the concept of "deficiency labor", the main causes of the disease include the human body's innate endowment of the weakness of the acquired qi and blood of the loss of nourishment, exogenous internal injuries, serious illnesses, strain injury to the body of the disease to the virtual as well as a variety of diseases such as mismanagement of the treatment, and ultimately lead to a systemic organs Functions of the body's organs and ultimately lead to the gradual decline of the spleen and stomach, the two are weak, blood, qi and yin and yang of the gradual and increasing deficiency, day after day for the main mechanism of the disease can be summarized and summarized in the Chinese medicine, "the essence of qi take away from the virtual," indicating that the main lesions in the parts of the five viscera, the five visceral essence of the lack of material is the essence of the fundamental loss [10]. Kidney is the foundation of the innate and spleen is the foundation of the innate, and the deficiencies of the spleen and kidney are more important in causing deficiency. Su Wen said: 'the positive gas is stored inside, the evil can not be dry, ....., the evil of the gathering, its gas must be weak', the positive gas deficiency is one of the important reasons for the development of gastrointestinal tumors. The effect of western medicine to correct malnutrition immediately is more prominent, but there are shortcomings of difficult to cure and high cost, while Chinese medicine has the advantage of good compliance, so it is of great significance to vigorously advocate the idea of combining traditional Chinese and western medicine in the treatment of gastrointestinal tumor-causing malnutrition. Nutritional support therapy of Chinese medicine, which utilizes the holistic and human-oriented concepts of Chinese medicine and focuses on enhancing patients' physical fitness, reducing pain and suffering, improving quality of life, slowing down the progression of the disease, and prolonging patients' survival time [11], has unique advantages in clinical practice and deserves to be vigorously promoted.

## 5. Study and Application of the Method of Benefiting Qi and Strengthening the Spleen in the Nutritional Support of Gastrointestinal Tumors

The development of gastrointestinal tumor is based on the deficiency of positive qi of the organism, deficiency of internal organs and invasion of evil, which can be attributed to the disease caused by deficiency labor. In Chinese medicine, the treatment of deficiency labor focuses on tonicity, as in Su Wen - Three Parts of the Nine Weather Theory: "The

deficiency is tonic". The generation of blood and qi in the human body, the operation of qi, and the transportation of water and grains are inseparable from the spleen and stomach, which, as the official of the granary, plays a crucial role in the prognosis of deficiency labor [12]. The prosperity and weakness of the spleen and stomach are related to the nutritional status and physical strength of deficiency labor patients, and if the spleen and stomach have sufficient qi, the body will be strong and have a good prognosis; if the spleen and stomach are in a state of decline, the body will be weak and have a poor prognosis. Therefore, the method of benefiting qi and strengthening spleen has an important position in the treatment of gastrointestinal tumors.

Spleen and stomach are the foundation of the latter day and the source of qi and blood biochemistry. For gastrointestinal tumor patients, we should pay attention to strengthening nutritional support and emphasize on supporting the positive, through tonifying the spleen and stomach, it can promote qi and blood generation and enhance the body's ability of resisting the evil, so that the positive qi will be recovered and the evil qi will be eliminated gradually. For patients with gastrointestinal tumors, they should pay attention to strengthening nutritional support and emphasize on supporting righteousness. By tonifying the spleen and stomach, it can promote the transformation of qi and blood and enhance the body's ability of resisting evils, so that the righteousness can be recovered gradually and the evils can be removed gradually. In the treatment of gastrointestinal tumors, Chinese medicine adopts the idea of treating both the symptoms and the root cause, tonifying the spleen and stomach can benefit the qi and strengthen the spleen to treat the root cause, and also strengthen the body to drive away the evil spirits to treat the symptoms, which is consistent with the theory of "positive qi exists in the body, and the evil spirits can not be interfered with" in the Emperor's Classic of Internal Medicine. Enhancing qi and strengthening the spleen can harmonize yin and yang, strengthen the body's ability to resist disease, reduce malnutrition and immune suppression after treatment, and restore the function of internal organs so as to rehabilitate the whole body.

## 6. Study and Application of Si Jun Zi Tang in Nutritional Support of Gastrointestinal Tumors

### 6.1 Composition of Si Jun Zi Tang

Sijunzi Tang is from the Song Dynasty's Taiping Huimin Heji Jvfang, the book wrote "Rongwei gas deficiency, viscera and bowels timid and weak. Heart and abdominal distension, the whole does not think of food, intestinal tinnitus and diarrhea, vomiting retching and vomiting, it is desirable to serve", is a traditional Chinese medicine classic formula, consisting of ginseng, poria, atractylodes macrocephala, baked licorice, in the application of tonic formulas occupies a very important position. Each of the four medicines in the formula is equally ground into a coarse powder, which has the effect of benefiting qi, strengthening the spleen, drying dampness and inducing diuresis. From ancient times to the present, the treatment of spleen and stomach qi deficiency is symptomatic when using Si Jun Zi Tang. In the formula, ginseng is the ruler to replenish the spleen and vital energy, replenish blood and

promote the production of fluids, support the positive and dispel evil; atractylodes macrocephala is the subject to assist ginseng to replenish the vital energy of the spleen and stomach [13], and to strengthen the spleen and dry the dampness; Poria is the adjuvant to atractylodes macrocephala to strengthen the transportation of spleen vital energy and to exude the dampness and turbidity; and baked licorice is used to replenish the spleen and benefit the vital energy, and to regulate the various medicines. The above four herbs cooperate with each other and constrain each other, playing the effects of benefiting qi, strengthening the spleen, drying dampness and inducing diuresis.

### 6.2 Modern Research on Gastrointestinal Tumors by Sijunzi Tang

It has been demonstrated that Sijunzi Tang, when applied to the treatment of clinical patients, can enhance gastrointestinal mucosal immunity, reduce gastrointestinal mucosal damage, and regulate gastrointestinal motility. For tumor patients, Sijunzi Tang can effectively play an anti-tumor role by playing its pharmacological role, and its mechanisms include: inducing apoptosis of tumor cells, inhibiting the growth of tumor cells, so that they can't continue to cause harm to the human body; enhancing the body's immunity and antioxidant capacity, increasing the effectiveness of drug reduction and prolonging the survival period of the tumor-bearing organism [14]. Modern pharmacological studies have shown that the effective extracts of Sijunzi Soup can accelerate the blood flow in human gastrointestinal tract, rebuild the subcellular function and change the cell structure of gastrointestinal tract, and promote the secretion of gastrointestinal mucus in human body, thus accelerating the metabolism of human gastrointestinal tract cell function, removing harmful free radicals, and protecting the normal gastrointestinal cells of human body, which in turn promotes the rapid restoration of patient's gastrointestinal tract function, and makes the nutritional status of the diabetic patients to be significantly improved [15]. Gastrointestinal mucosal immune system is the body's largest mucosal immune response organs, but also the body's digestive system cells and autoimmune system composed of two important functional components. Studies have shown that Sijunzi has the biological ability to promote the proliferation and division of mucosal cells [16]. Pharmacological studies of the Four Gentlemen Soup, which includes Codonopsis pilosulae, Poria, Atractylodes macrocephala, and Glycyrrhiza glabra, have shown that Codonopsis pilosulae and Poria can effectively increase the activity of pepsin, improve phagocytosis of macrophages, and promote the transformation of lymphocytes, as well as have significant antioxidant and antitumor effects [17]; Rhizoma Atractylodis Macrocephalae can enhance the scavenging of free radicals, regulate the bi-directional movement of intestinal tubes, and increase gastrointestinal motility; Poria cocos, as a new type of immune-modulating nutrient supplements, is able to stimulate the restoration of the immune function of the human body; and licorice is able to promote cell differentiation and synthesis.

## 7. Summary and Outlook

The Yellow Emperor's Classic of Internal Medicine says, "A man is born with stomach qi; if he has stomach qi, he will live;

if he does not have stomach qi, he will die", and the prevalence or decline of stomach qi determines the prognosis and regression of a disease. Chinese medicine emphasizes the prevention of diseases, and the protection of positive qi is the basis of disease prevention. In the treatment of diseases, the importance of the vitality of the vital energy is also emphasized. Zhang Zhongjing once said in *The Essentials of Poverty*: "The spleen is not subject to evil in the four seasons." The spleen is not only one of the four seasons, but also generates blood and fluid, moistening the five organs and six bowels. Zhang Zhongjing's words can be interpreted to mean that if the qi of the spleen and stomach is strong, external evils cannot invade and diseases are not easy to be contracted. The spleen and stomach are the foundation of the latter day, the source of qi and blood, and if the spleen produces enough water and grains, then the positive qi will be strong and resistant to evils [15].

Sijunzi Tang is widely used in clinical practice for patients with deficiency of spleen and stomach qi, and its effects of benefiting qi, strengthening the spleen, seeping dampness and inducing diuresis are also widely used in the field of tumor diseases to enhance the immunity of patients and strengthen the nutritional support for patients [18]. Based on Sijunzi Tang, suitable medicines are used to treat malnourished gastrointestinal tumor patients, as well as residual tumors and micrometastases after treatment, which has achieved certain efficacy in clinical practice. Compared with Western medicines, Sijunzi Tang, a basic formula, can not only control the continued development of some malignant tumors, prolong the survival time of patients and improve their quality of life, but also has a certain effect in preventing recurrence and metastasis after treatment and reducing side effects. The rich variety of Chinese medicines and the various dosage forms can meet the various needs of patients, and the price is relatively inexpensive and the side effects are small, which is suitable for patients with chronic diseases to take safely for a long period of time. The combination of Chinese and Western medicine for nutritional support of gastrointestinal tumors can complement each other's advantages and is of great clinical significance for the innovation of its treatment method.

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