

# Discussion on the Prevention and Treatment of Gastric Precancerous Lesions Based on the Theory of Toxicity and Deficiency in Zhuang Medicine

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**Abstract:** Gastric precancerous lesions represent a critical transitional stage, marking the final opportunity for intervention before the onset of gastric cancer. Drawing parallels between the toxicity and deficiency theory of Zhuang medicine and the pathogenesis of gastric precancerous lesions, it is postulated that toxicity serves as a pivotal extrinsic factor in their development, while deficiency constitutes an intrinsic underlying cause. In addressing and managing gastric precancerous lesions, Zhuang medicine emphasizes the importance of regulating vital energy (qi), detoxify, replenishing deficiencies, harmonizing the body's energy pathways, and balancing the functions of internal organs, including qi, blood, bones, and flesh. By exploring the role of the toxicity and deficiency theory of pathogenesis in the prevention and treatment of gastric precancerous lesions within the framework of Zhuang medicine, this study can significantly advance both the clinical management of this condition and the broader development of Zhuang medicine.

**Keywords:** Zhuang medicine; Theory of toxicity and deficiency; Gastric precancerous lesions; Gastric cancer; Prevention and treatment

**Online publication:** December 31, 2024

## 1. Introduction

According to statistics, 260,000 people died from gastric cancer (GC) in China in 2022 <sup>[1]</sup>. A 2014 report indicated that malignant tumor deaths ranked second among all causes of death in Guangxi, making it one of the leading causes of death for residents in the region, with GC accounting for the third highest cause of death among malignant tumors <sup>[2]</sup>. The development of GC is not instantaneous. Based on the Correa model of typical intestinal-type gastric cancer <sup>[3]</sup>, GC progresses through the following stages: chronic non-atrophic gastritis

(CNAG), chronic atrophic gastritis (CAG), intestinal metaplasia (IM), dysplasia (Dys), and finally GC. Gastric precancerous lesions (GPL) refer to chronic atrophic gastritis, as well as intestinal metaplasia and dysplasia of the gastric mucosa that occur secondary to atrophic changes in the gastric epithelial lining. The 2022 Chinese Integrated Guidelines for the Clinical Management of Gastric Precancerous Lesions categorize CAG, IM, and Dys as gastric precancerous lesions. Evidence suggests that within five years of diagnosis, the annual incidence of gastric cancer progression from intestinal metaplasia is 0.25%, from mild to moderate dysplasia is 0.6%, and from severe dysplasia is 6% [4]. The Correa model indicates that there is sufficient time during the GPL stage to treat and potentially reverse the development of GC. In current modern medical practice, treatments for GPL primarily include eradication of *Helicobacter pylori*, administration of vitamin B12 with folate to inhibit oncogene expression, endoscopic submucosal dissection and endoscopic mucosal resection, as well as regular monitoring and follow-up [5]. Endoscopic submucosal dissection is suitable for cases of severe dysplasia and early-stage GC [6]. While eradication of *Helicobacter pylori* and vitamin supplementation have demonstrated positive effects in the treatment of GC, current research is insufficient to support their role in treating GPL [7].

Zhuang medicine is an integral part of traditional Chinese medicine, with a comprehensive theoretical guidance system. Gastric precancerous lesions fall under the category of “Gu Dao” diseases in Zhuang medical theory. “Gu Dao” (Zhuang language: “Tiao Gen Ai”) primarily refers to the esophagus and gastrointestinal tract, which are the passageways for the digestion and absorption of food [8]. The “toxicity and deficiency theory of pathogenesis” is a unique etiological and pathomechanism doctrine in Zhuang medicine. Zhuang medicine emphasizes that “toxicity and deficiency cause all diseases” and believes that all illnesses are caused by “toxic pathogens.” The concept of toxicity is based on whether it causes harm to the human body and the extent of that harm. Gu Dao toxic diseases refer to conditions where toxic pathogens obstruct the Gu Dao, affecting its function and leading to dysfunctional disorders. According to the *Huangdi Neijing Suwen Ben Bing Lun*, “When people eat and overexert, they injure their spleen.” For example, in Zhuang communities, major causes of GC and GPL include excessive consumption of preserved pork [9]. “Deficiency” is another crucial factor contributing to the development of diseases. It refers to a deficiency of healthy qi, blood, or vessels. Deficiency can be both a cause of disease and a pathological consequence or manifestation. If a person’s body is weak and cannot withstand the attack of toxic pathogens, it can also lead to the occurrence of diseases [10]. In terms of treatment, Zhuang medicine focuses on detoxification and replenishing deficiencies, following the principles of regulating qi, detoxifying, and replenishing deficiencies. Detoxification is essential, and treatments are targeted, with an emphasis on external therapies and preventing toxicity. “Internal treatment detoxifies to eliminate the cause of disease, while external treatment detoxifies to expel toxins.” Over time, Zhuang medicine has accumulated considerable experience in treating Gu Dao diseases and has achieved positive results [11,12]. This article explores the prevention and treatment of gastric precancerous lesions based on the theory of toxicity and deficiency of pathogenesis in Zhuang medicine, offering insights to colleagues in the field.

## **2. Zhuang medicine’s theory of toxicity and deficiency of pathogenesis and precancerous lesions of gastric cancer**

### **2.1. Toxicity as a pathogenic condition for GPL**

Lingnan is rich in toxins, as stated in *Herbal Remnants*, “Lingnan has many poisonous herbs.” The word “toxic” has multiple interpretations. According to *Explaining Words and Expressions*, the original meaning of the word

“toxic” refers to poisonous herbs. For example, *Huainanzi Xiuwuxun* records that “Shennong began to teach people to sow five grains...taste a hundred herbs...encounter seventy toxins in one day,” indicating that there are many poisonous plants in Lingnan, and the Zhuang people survive in this geographical environment rich in toxins. The *Essential Prescriptions from the Golden Cabinet* states, “Toxicity refers to the accumulation of evil qi that cannot be resolved.” In the *Huangdi Neijing*, toxicity sometimes refers to the side effects of medications. For instance, “Those who can withstand toxins should take strong medications, while those who cannot should take weaker ones.” It also mentions that “strong toxins can cure six out of ten diseases; moderate toxins, seven out of ten; minor toxins, eight out of ten; and non-toxic treatments, nine out of ten. Food and nourishment from grains, meat, fruits, and vegetables should be used to their fullest. Do not overdo it, lest it harms the body’s vital energy.” It also refers to pathogenic factors and pathogenesis, stating that excessive qi becomes toxic, including cold toxicity, heat toxicity, dampness toxicity, wind toxicity, etc.

In Zhuang medicine, toxicity mainly includes four aspects: first, the cause of disease, as Zhuang medicine has a theory that toxicity and deficiency cause all illnesses; second, toxic substances such as poisonous herbs; third, poisonous drugs and antidotes, such as hook-nosed snakes and datura; fourth, disease syndromes, such as measles toxicity and gu poisoning. *Wang’s Medical Records* states, “Latent diseases, the six excesses, various stagnations, diet, blood stasis, phlegm accumulation, qi accumulation, water accumulation, and various parasites all contribute to this.” Zhuang medicine believes that when a substance harms the human body and the damage can reach a certain level, it can be called toxic. According to research, risk factors for GC include *Helicobacter pylori* infection, long-term high-salt diet, smoked, fried food, red meat and processed meat intake, unhealthy eating habits, smoking, heavy drinking, etc. A report on the epidemiology of GC in Jingxi County, Guangxi, pointed out that the risk of gastric cancer in *Helicobacter pylori*-positive individuals in this area is 29 times higher than that of *Helicobacter pylori*-negative individuals, indicating that *Helicobacter pylori* is a toxin that can harm the human body. A multivariate analysis of 131 GC patients revealed that the influential factors were *Helicobacter pylori* infection, drinking non-tap water sources, and a preference for pickled foods. Many customs in the Zhuang dietary culture can become pathogenic toxins. For example, the Zhuang people are fond of drinking, eating raw and cold foods, and pickled foods. In some villages, almost everyone drinks alcohol, and it is customary to drink during festivals or gatherings with friends and family. Plus, the Zhuang people are also skilled in brewing, and every household can make wine. Common types of wine include rice wine, longan wine, gecko wine, and three-snake wine. Due to the rich natural resources and suitable plant growth environment in their residential areas, the Zhuang regions have advantageous conditions for using raw medicines, making the Zhuang people develop a habit of eating raw foods”, such as raw sugar cane, star fruit, tamarind, mountain cherry, ginger, garlic, betel nut, etc. The Zhuang areas also have a custom of pickling bacon. The Zhuang people like to soak pork in high-salt during the Spring Festival, and then smoke or sun-dry it. The bacon made this way can be stored for a long time. These customs in Zhuang areas align with the high-risk factors for GC and have long been integrated into the lives of the Zhuang people. Unhealthy eating habits fit the definition and connotation of toxicity. External evil qi remains in the human body for a long time, constantly fighting with the body’s vital energy. In the long run, if the vital energy cannot overcome the evil qi, diseases will arise <sup>[13-15]</sup>.

## 2.2. Deficiency as the underlying cause of GPL

“When the Qi is preserved, evil qi cannot invade.” Deficiency is both the cause of disease and the pathological outcome and manifestation. After evil qi invades the human body, whether the disease occurs depends on the

body's resistance to evil qi and the strength of its own detoxification function. Danxi Zhu said <sup>[16]</sup>, "When qi and blood are harmonious, no disease occurs. Once there is stagnation, various diseases arise." As a cause of disease, deficiency can lead to decreased organ function and reduced ability to defend against external evil qi, making it easier to contract evil qi and form a situation where deficiency and toxicity coexist. People in Lingnan areas are prone to physical deficiency, which is closely related to the environment. The climatic characteristics of Lingnan belong to the subtropical humid monsoon climate, with an average annual temperature of about 21.6°C<sup>[17]</sup>. The summer duration is long, there is less frost and snow in winter, rainfall is abundant, wet in summer, and dry in winter. Influenced by the natural view of heaven and earth, Zhuang medicine has summarized the understanding of the synchronization of heaven, earth, and human qi. It believes that human beings survive in nature, rely on natural conditions for survival and development, and are restricted by them. All physiological changes and behavioral activities of human beings must conform to the external world, resonating with climate and environment at the same frequency, that is, human beings and the qi of heaven and earth are synchronized. The Zhuang people have long survived in a hot and humid environment. As humans correspond to nature, yang qi also leaks out all year round, especially in winter when yang qi should be closed and stored. However, due to the special climate in Lingnan during winter, it is exposed. In the long run, a yang deficiency constitution is formed. Zhuang medicine emphasizes replenishing deficiency in treating diseases, and the Zhuang people have a dietary culture of "eating meat to replenish deficiency," which provides indirect evidence for the characteristic of yang deficiency among people living in Lingnan. When yang qi is insufficient, evil qi prevails. Therefore, on the basis of physical deficiency, evil qi has the opportunity to invade the human body. As a pathological outcome, deficiency can not only cause disease but also accelerate the deterioration of the disease, or even lead to death. For example, CAG patients are mainly characterized by spleen and stomach deficiency <sup>[18]</sup>. As the Correa pathological model progresses, the syndrome of stomach meridian blood stagnation increases. The special geographical environment in Lingnan makes the yang qi of the Zhuang people who have lived there for a long time float outside all year round. If they do not take care of themselves in their daily lives, they are more susceptible to yang deficiency. On this basis, coupled with the infringement of *Helicobacter pylori* toxicity and unhealthy eating habits, it directly affects the stomach, leading to stomach meridian obstruction, affecting its ability to transport diet and water, limiting the intake of diet and water, resulting in a lack of qi and blood production in the body, making the body more deficient. Severe physical deficiency makes it easier to contract toxicity, and severe toxicity makes the body more deficient, creating a vicious cycle. Therefore, Lingnan is prone to physical deficiency, and people living there do not pay attention to self-care. If they continue to be exposed to toxins for a long time, cancer toxins will brew, attack the stomach, and develop into GPL <sup>[19]</sup>.

### **3. Treatment principles and methods of GPL based on Zhuang medicine's theory of toxicity and deficiency of pathogenesis**

#### **3.1. Disease identification**

Although the disease condition is complex, each disease necessarily has its own pathogenesis, and there must be a basic and core pathogenesis that determines the occurrence, development, change, and prognosis of the disease, as well as the treatment method for the disease. For example, precancerous lesions of gastric cancer consist of different stages of lesions, but each stage has its unique characteristics. One of the characteristics of

intestinal metaplasia is that gastric epithelial cells are replaced by goblet cells. During clinical practice, the stage of the disease is identified based on this characteristic, the core pathogenesis is grasped, the basic treatment principles are clarified, and then different clinical manifestations are identified based on syndromes, and finally, the treatment method and medication are determined. This allows us to grasp the core pathogenesis and identify toxic diseases.

### **3.2. Emphasis on detoxification and nourishing deficiency**

Detoxification is a fundamental approach in Zhuang medicine for treating diseases, especially toxic diseases. Zhuang medicine recognizes a wide range of toxic diseases with various etiologies and pathogenesis, but all can be attributed to toxicity as their root cause, damaging the human body. Therefore, treatment of toxic diseases should involve detoxification methods such as internal medication and external therapies to eliminate toxic pathogens. When the toxic pathogens are removed, the body's channels and networks become unobstructed, allowing the three qi (vital energies) to synchronize and restore the balance between yin and yang, leading to the body's natural healing. Based on the pathogenic characteristics of toxic pathogens, the treatment can be summarized as "internal detoxification to eliminate the cause, and external detoxification to guide the toxins out."

While detoxifying, it is essential to nourish deficiencies. Deficiency-based clinical manifestations are often seen in prolonged illnesses, chronic diseases, and the recovery phase after eliminating pathogenic toxins. In such cases, nourishing deficiency should be the priority in treatment. Zhuang medicine emphasizes the use of dietary therapy and animal-derived medications, believing that humans should follow the natural order and nourish deficiencies primarily through dietary means. Zhuang medicine considers the use of flesh and blood-enriching substances as the best approach to nourishing deficiencies.

### **3.3. Targeted use of detoxification medications**

The application theory of toxicity and deficiency of pathogenesis in Zhuang medicine states that appropriate external or internal therapies should be selected based on the characteristics of the toxin for detoxification treatment. Through clinical practice, Zhuang medicine has summarized various detoxification medications tailored to different toxic causes, enhancing the targeted approach and improving clinical efficacy. For example, in the treatment of gut pathway toxic diseases, commonly used herbs include Shan Bi Dou (hyacinth bean), mango, buckwheat, papaya, huangpi fruit, orange-red bead, and golden vals.

### **3.4. Numerous external treatment methods**

Zhuang medicine emphasizes both internal and external treatments in detoxifying and curing diseases, with external therapies being the mainstay. This has led to the development of a series of external treatment methods. Commonly used external therapies in the treatment of GPL include Zhuang medicine thread moxibustion, Zhuang medicine acupuncture, and Zhuang medicine lamp fire moxibustion <sup>[20,21]</sup>.

### **3.5. Emphasis on toxin prevention**

Zhuang medicine advocates early detection of diseases, prevention when healthy, and timely treatment of those already affected. Through long-term practice, Zhuang medicine recognizes the importance of prevention over treatment, particularly emphasizing "preventive measures before illness" and has accumulated rich methods and

experiences in toxin prevention.

## 4. Common methods for preventing and treating GPL under the theory of toxicity and deficiency of pathogenesis in Zhuang medicine

### 4.1. Dietary

Zhuang medicine follows the principles of regulating qi, detoxifying, and nourishing deficiencies in treating diseases. The development of GPL is closely related to unhealthy eating habits, and targeted dietary approaches can be used to replenish yang qi and adjust the constitution. In the prevention and treatment process, removing risk factors and changing unhealthy eating habits are paramount. This includes abstaining from alcohol, regulating meal times, avoiding cold and fried foods, and reducing high-salt and preserved foods. By weakening toxic pathogens, a conducive environment for the body's recovery can be created. The Zhuang people traditionally use meat and animal blood to nourish and strengthen the body. These flesh and blood-enriching substances are considered beneficial for those with deficiencies. One such traditional meat, mutton, is believed to nourish deficiencies, warm the middle jiao, and benefit the lower jiao. Following the belief of "like nourishes like," the Zhuang people consume animal blood to replenish blood. Additionally, the Zhuang people have a custom of using medicinal diets, which can be traced back to the Western Han Dynasty. Zhuang medicine believes that humans and animals share a spiritual connection, and apart from being food, animals can also serve as medicinal diets for treating illnesses <sup>[22]</sup>. In the treatment of stomach diseases, medicinal diets such as ginger and pork tripe soup and ginger pepper crucian carp soup are commonly used. Furthermore, Zhuang medicine employs flesh and blood-enriching substances as guides for herbal medications, which is a unique aspect of Zhuang medicine <sup>[23]</sup>. Enhancing the constitution is crucial in the treatment of GPL, as it not only improves the body's resistance to toxins but also aids in the efficacy of medications.

### 4.2. Medication

To prevent diseases and ward off toxins, the ancestors of the Zhuang people have summarized a wealth of effective and unique methods of medicinal toxin prevention. Zhuang medicine is characterized by its specific treatments for specific diseases, utilizing simple yet powerful medications. Commonly used herbs for treating GC-related toxins include Xianhe Cao (hairyvein agrimonia), Baihua Sheshe Cao (*Hedyotis diffusa*), and Huangyao Zi (Rhizoma *Dioscoreae bulbiferae*). The Zhuang medicine prescription "Weidu Qing" has been clinically proven to improve the symptoms of patients with *Helicobacter pylori*-infected yang syndrome of the stomach (chronic antrum gastritis) and demonstrate inhibitory effects on transplanted GC in nude mice, significantly suppressing tumor growth. Additionally, the Zhuang people have traditional remedies for stomach pain, such as consuming sesame and honey together, chewing on the roots of Liutou Cao (*Plantago asiatica*), taking eggshell powder fried in yellow, and eating raw peanuts. Other commonly used Zhuang medicine prescriptions include Zhuang medicine Yinhua Mabian Powder, Baihu Danwei Shu Powder, Huoba Luoxuan Decoction, Shancang Shuangjiang Decoction, Jiubing Xiere Decoction, Shanjiang Qushi Decoction, Chantui Ercao Decoction, and Dingqia Quyu Decoction. In Guangxi Jingxi and other Zhuang-populated areas, a grand medicine market is held every year on the fifth day of the fifth lunar month. Families participate in this event to buy, sell, observe, smell, and learn about various medications, aiming to absorb the essence of numerous herbs and prevent diseases <sup>[24-26]</sup>.

### 4.3. External therapies

External therapies in Zhuang medicine have a long history. The human body is believed to have two crucial internal closed pathways: the Dragon Path (Long Lu) and the Fire Path (Huo Lu). These pathways branch and spread throughout the body, forming a network of nodes on the body's surface. External therapies in Zhuang medicine directly stimulate these nodes on the Dragon Path and Fire Path through medicinal or non-medicinal means, aiming to eliminate toxins, regulate qi and blood pathways, and restore the synchronous flow of heaven, humans, and earth qi. The application of external therapies in GPL primarily focuses on relieving stomach pain. Among these, Zhuang medicine thread moxibustion is widely used, often in conjunction with other treatment methods. Additionally, Zhuang medicine practices such as muscle-tendon therapy, acupoint application, and cupping therapy are also commonly employed in clinical settings<sup>[27,28]</sup>.

### 4.4. Folk methods

The Zhuang people are known for their singing and dancing abilities. The discovered Huashan cliff paintings in Ningming County, Guangxi, can be traced back to the Warring States Period and the Western Han Dynasty. The cultural connotation of these cliff paintings is widely believed to represent frog dance rituals created by Zhuang medicine for disease prevention and physical strengthening, which have profoundly influenced modern ethnic sports. Similar to the ancient Wu Qin Xi (Five-Animal Exercises), Zhuang dances aim to strengthen the body and enhance disease resistance. Physical activities like dance and qigong are beneficial for GPL patients in improving their physical health. The Zhuang people also practice isolation and avoidance of contaminants. When someone in the family suffers from an infectious disease, they isolate themselves and hang signs on their doors to decline visitors. Given the infectious nature of *Helicobacter pylori*, the practice of using communal chopsticks when dining with *Helicobacter pylori*-positive individuals aligns with the Zhuang people's tradition of isolation and avoidance of contaminants. During the "March 3<sup>rd</sup>" festival, the Zhuang people often make five-colored glutinous rice meals using fragrant maple leaves, turmeric, and other medicinal herbs, believed to promote qi circulation and stomach health<sup>[29,30]</sup>.

## 5. Conclusion

Zhuang medicine represents the valuable experience and wisdom of the Zhuang people, making significant contributions to their development history. It plays a crucial role in protecting the health of the Zhuang community and is a vital means of preventing and treating major and common diseases. Zhuang medicine emphasizes that toxicity and deficiency are two critical factors leading to GPL. In preventing GPL, it is essential to consider the unique geographical and climatic conditions of Zhuang regions, timely nourish deficiencies, maintain healthy qi through dietary therapy and exercise, and eliminate unhealthy eating habits. Treatment should focus on detoxification and nourishing deficiencies, utilizing internal medications and external therapies to eliminate pathogenic toxins such as *Helicobacter pylori* and replenish the body's vital qi through dietary supplements and medicinal diets, preventing the progression of GPL to GC.

## Funding

(1) Guipai Xinglin Young Talents of Guangxi University of Chinese Medicine (2022C035)

- (2) Guangxi First-Class Discipline: Traditional Chinese Medicine (Scientific Research of Guangxi Education Department [2022] No. 1)
- (3) Guipai Chinese Medicine Inheritance and Innovation Team of Guangxi University of Chinese Medicine – Clinical Medicine Research and Application Innovation Team of Zhuang Medicine Poison Disease (2022A003)
- (4) Qihuang Scholar Cultivation Program of Guangxi (YP)

## Disclosure statement

The authors declare no conflict of interest.

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