

Application of the “Qi, Acid, Bacteria” Concept in Functional Gastrointestinal Disorders (FGIDs)

Xiaolin Liao, Jing Yang

Chongqing Traditional Chinese Medicine Hospital, Chongqing 400000, China

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Functional gastrointestinal disorders (FGIDs) refer to a group of diseases characterized by a series of gastrointestinal symptoms without apparent organic lesions, leading to pathological changes in areas such as the oropharynx, stomach, intestines, anus, and biliary tract. In recent years, the incidence of FGIDs has been increasing annually, with over 40% prevalence globally. However, there is currently no unified standard for treatment both domestically and internationally. This paper defines “Qi” as the spleen-stomach “qi” in traditional Chinese medicine (TCM), where the spleen governs transformation and transportation, and the stomach governs reception and digestion, working together to digest food and absorb nutrients, akin to the gastrointestinal digestive and absorptive functions in Western medicine. “Acid” refers to gastric acid, and “bacteria” denotes the gastrointestinal microbiota. Through modern pharmacological research on TCM herbs combined with traditional TCM concepts, the regulation of gastric acid and gastrointestinal microbiota using relevant herbs has shown efficacy in controlling FGIDs. This paper summarizes and analyzes the “Qi, Acid, Bacteria” theory and provides clinical case examples to demonstrate its effectiveness, suggesting that this approach can offer new insights into the clinical treatment of FGIDs.

Keywords: Functional gastrointestinal disorders; Integrated traditional Chinese and Western medicine; Qi, acid, microbiota theory

Online publication: May 31, 2026

1. Introduction

Functional gastrointestinal disorders (FGIDs) are diseases characterized by a series of gastrointestinal symptoms without apparent organic lesions. Initially, patients may experience gastrointestinal symptoms such as oropharyngeal, gastric, intestinal, anal, and biliary tract lesions, which can be named based on the signs and severity of different FGIDs patients. As FGIDs progress, some patients may develop systemic symptoms like headaches and dizziness, or even neurological symptoms such as anxiety and insomnia. If mental disorders occur in FGIDs patients, it is essential to actively identify any organic lesions for accurate diagnosis.

In today’s society, with rapid economic development and fast-paced lifestyles, changes in dietary

preferences and structures have increased the risk of FGIDs, with a global prevalence exceeding 40% [1]. However, there is currently no unified standard for treatment both domestically and internationally. The integration of traditional Chinese and Western medicine theories can provide treatment ideas for such diseases.

2. Application of “Qi”

According to basic TCM theory, the spleen and stomach are the sources of “qi” production. TCM scholars believe that the spleen governs transformation and transportation, while the stomach governs reception and digestion. If the spleen and stomach are healthy, the body can smoothly digest food and absorb nutrients. If the spleen is damaged but the “qi” is abundant, it can distribute nutrients to the heart and lungs, which then convert them into body fluids and blood. Therefore, nutrients, body fluids, and blood can all transform into “qi”, known as the ““qi” of food and grain” in TCM, which circulates throughout the body’s meridians and is the source of Zang-fu organ ““qi””. Thus, the spleen and stomach can produce “qi”. If the spleen and stomach’s transformative and distributive functions are disrupted, affecting the absorption of food nutrients, it can lead to a deficiency of food “qi” and hinder its production.

The spleen “qi” ascends, and the spleen prefers dryness and dislikes dampness. Spleen “qi” descent may be related to the following pathogenic mechanisms: for instance, spleen “qi” deficiency leading to weak ascending function, resulting in spleen “qi” descent. It is recommended to use “qi”-tonifying and spleen-strengthening formulas, such as Buzhong Yiqi Decoction or Sijunzi Decoction, with common herbs like *astragalus* and ginseng. Another example is dampness obstructing the spleen, also leading to weak ascending function or even descent. It is recommended to use spleen-strengthening and dampness-eliminating formulas, such as Huoxiang Zhengqi San or Pingwei San, with common herbs like *Agastache*, tangerine peel, and *Atractylodes*. Spleen “qi” should ascend, while stomach “qi” should descend. If the stomach loses its descending function, it can cause symptoms like abdominal distension, pain, dullness, and constipation. If stomach “qi” rebels upwards, it can cause symptoms like hiccups, belching, nausea, and vomiting. Tian Lin and other scholars, based on spleen-stomach theory, deeply explored the impact of spleen-stomach “qi” movement on bodily health and integrated TCM knowledge related to spleen-stomach “qi” movement and gastrointestinal motility to discuss treatment plans targeting the spleen and stomach meridians [2]. For example, they administered seven herbs with spleen-stomach “qi”-regulating functions to guinea pig stomachs in experiments, stimulating gastric smooth muscle contraction. They found that all seven herbs had significant prokinetic effects, enhancing spleen-stomach transformative function with excellent results.

The stomach prefers moisture and dislikes dryness, so it is essential to maintain sufficient body fluids in the stomach for food reception and digestion. When treating stomach diseases (FGIDs), it is crucial to protect stomach fluids. Herbs like *Adenophora* and *Ophiopogon*, which belong to the stomach meridian, are clinically used for their stomach-nourishing and fluid-generating effects, often showing significant efficacy in treating FGIDs symptoms like dry mouth, dry throat, and constipation.

3. Regulation of “acid”

The human stomach wall contains two types of secretory cells: one secretes digestive enzymes, and the other secretes gastric acid. Gastric acid (0.2–0.4% hydrochloric acid) in gastric juice can activate pepsinogen,

increasing pepsin production, and create an acidic environment for pepsin to function, killing bacteria introduced with food into the stomach. Additionally, the presence of gastric acid in the small intestine can increase intestinal fluid and pancreatic juice production, facilitating the absorption of substances like calcium and iron. It also enhances the stomach's ability to decompose muscle fibers and connective tissue in food, denaturing proteins and improving digestion. Gastric acid can also act on antral cells to reduce gastrin secretion. Gastric acid plays a crucial role in the entire digestive system. However, excessive gastric acid secretion, influenced by various factors, can cause symptoms like acid reflux, heartburn, retrosternal burning pain, and epigastric pain. Clinically, herbs like arca shell, cuttlebone, thunberg fritillary bulb, coptis, and evodia are commonly used to regulate gastric acid balance. Arca shell contains weakly alkaline CaCO_3 , which can effectively neutralize excess gastric acid, significantly inhibit pepsin activity, and protect the gastric mucosa^[3]. The mucilage can form a thin protective layer on the gastric and duodenal mucosa surfaces, accelerating granulation tissue growth and shortening ulcer healing time^[4]. Chen Weiwen et al. conducted preliminary pharmacological experiments using a chronic hypergastrinemic and hyperacid secretory model and found that a self-made TCM decoction (mainly containing evodia and coptis) significantly inhibited excessive gastric acid secretion in the model, with a 50% reduction in gastric acid flow compared to the control group^[5].

4. Regulation of “bacteria”

In a healthy state, the intestines contain a large number of microorganisms, primarily beneficial bacteria, with a constant proportion of various bacterial groups that mutually depend and restrain each other, maintaining a dynamic balance. Clinical practice shows that there are approximately 400–500 types of intestinal bacteria, which can be classified as exogenous or indigenous based on their origin, with indigenous bacteria being the beneficial bacteria in the intestines^[6]. Under normal gastrointestinal function, intestinal bacteria exert biological barrier effects, such as anti-aging and immune functions, while promoting bodily metabolism. After gastrointestinal lesions occur, the intestinal environment becomes disrupted, and antibiotic use can inhibit the proliferation of some gastrointestinal bacteria while allowing others to proliferate rapidly, leading to bacterial imbalance and aggravating gastrointestinal lesions. Additionally, bacterial imbalance can damage the intestinal mucosa's biological barrier, affecting the prognosis of gastrointestinal diseases^[7]. Multiple studies have proven the significant value of TCM in regulating intestinal bacteria, eliminating harmful bacteria, and protecting beneficial bacteria. Further analysis of TCM's protective effect on beneficial bacteria has revealed that polysaccharide components, TCM compound preparations, and TCM extracts can all protect beneficial bacteria^[8]. Wang Haoran found in his research on the effect of TCM on beneficial bacteria growth that various traditional TCM herbs can stimulate the proliferation of *Lactobacillus paracasei*, such as herbs with blood-regulating or tonifying effects, without affecting the proportion of beneficial bacteria in the gastrointestinal tract^[9]. Currently, many studies indicate that many TCM herbs and gastrointestinal beneficial bacteria mutually promote each other. On one hand, TCM herbs can promote the growth and proliferation of beneficial bacteria while providing a favorable environment and nutrients. On the other hand, gastrointestinal beneficial bacteria can further assist in the metabolism, decomposition, and absorption of TCM herbs, helping them exert their pharmacological effects. Representative herbs include hawthorn, medicated leaven, chicken gizzard lining, and malt.

5. Clinical cases

5.1. Example of clinical case 1

Ms. Xu, aged 38, first visited our hospital on July 8, 2019. She had been experiencing recurrent upper abdominal distension for one year, accompanied by acid reflux and heartburn after consuming sweet potatoes, a recent decrease in appetite, poor sleep quality, and loose stools. Observation of her tongue and pulse revealed a pale tongue, thick coating, thin pulse, and tooth marks on the sides of the tongue. Gastroscopy indicated chronic non-atrophic gastritis; the breath test (carbon-14) was negative. Western medicine diagnosis: chronic atrophic gastritis; Traditional Chinese Medicine (TCM) diagnosis: fullness and distension, with a pattern of spleen and stomach deficiency. Treatment aimed to replenish “qi”, strengthen the spleen, and promote “qi” circulation to alleviate fullness. The modified Xiangsha Liujunzi Decoction was prescribed as the main formula, consisting of 15 g of *Codonopsis pilosula* (Taizishen), 15 g of *Poria cocos*, 15 g of stir-fried *Atractylodes macrocephala*, 15 g of *Pinellia ternata* (prepared with ginger), 15 g of *Citri reticulatae pericarpium*, 15 g of *Cyperus rotundus*, 15 g of *Citrus aurantium*, 15 g of *Magnolia officinalis*, 15 g of *Areca catechu* peel, 10 g of *Coptis chinensis*, 20 g of *Arca subcrenata* shell, 15 g of *Thunberg fritillary* bulb, and 10 g of prepared *Glycyrrhiza uralensis*. Seven doses were prescribed, decocted in water, with one dose taken daily divided into three servings. The patient was advised to abstain from spicy, greasy, and stimulating foods. On the second visit on July 17, 2019, the symptoms of fullness had significantly subsided, but the patient was hesitant to eat more, and the stools had become formed. However, she reported light sleep and easy awakening. The tongue was pale with tooth marks on the sides, a thin and greasy coating, and a thin pulse. To the previous formula, 30 g of *Polygonum multiflorum* (Yejaoteng), 10 g of honey-processed *Polygala tenuifolia*, and 10 g of stir-fried *Crataegus pinnatifida* were added. Seven doses were prescribed, with the same decoction and administration method as before. On the third visit on July 24, 2019, there was no sensation of upper abdominal fullness, appetite had improved, and sleep had also improved. Both bowel movements and urination were normal. Observation of the tongue and pulse revealed a pale red tongue, thin yellow coating, thin pulse, and tooth marks on the sides of the tongue. Another seven doses were prescribed, and follow-up revealed the disappearance of all symptoms.

5.2. Example of clinical case 2

Patient Wang, female, aged 12, first visited on July 9, 2023, with a chief complaint of halitosis for one year, which had worsened in the past five days. There was no acid reflux or heartburn, normal appetite and sleep, loose stools, and normal urination. The tongue was red with a thin yellow and greasy coating, and the pulse was thin. TCM diagnosis: halitosis, with a pattern of spleen deficiency and damp-heat. Western medicine diagnosis: gastrointestinal dysfunction. Treatment aimed to replenish “qi”, strengthen the spleen, clear heat, and resolve dampness. The modified Liujunzi Decoction was prescribed as the main formula, consisting of 20 g of *Poria cocos*, 20 g of stir-fried *Atractylodes macrocephala*, 10 g of *Eugenia caryophyllus*, 15 g of *Citri reticulatae pericarpium*, 20 g of *Coicis semen*, 10 g of *Foeniculum vulgare*, 9 g of *Pinellia ternata* (prepared), 10 g of *Magnolia officinalis* (prepared with ginger), 15 g of *Perilla frutescens* stem, 15 g of *Citrus aurantium*, 10 g of *Amomum tsao-ko*, 10 g of prepared *Glycyrrhiza uralensis*, 15 g of *Thunberg fritillary* bulb, 15 g of *Corydalis yanhusuo*, 10 g of *Dendrobium officinale*, 15 g of cleaned *Crataegus pinnatifida*, 15 g of *Prunus mume*, 10 g of *Mosla chinensis*, 15 g of *Ophiopogon japonicus*, and 20 g of *Codonopsis pilosula* (Taizishen). Seven doses were prescribed, decocted in water, with one dose taken daily divided into three

servings. On the second visit on July 16, 2023, the halitosis had significantly subsided, but the stools were slightly dry, and the tongue coating was thick and greasy. The previous formula was modified by replacing *Citri reticulatae pericarpium*, *Pinellia ternata* (prepared), *Perilla frutescens* stem, and *Corydalis yanhusuo* with 15 g of *Cassia obtusifolia*, 10 g of *Curcuma longa*, 15 g of *Rosa rugosa*, and 10 g of *Nelumbo nucifera* leaf. Seven doses were prescribed, with the same decoction and administration method as before. On the third visit on July 23, 2023, the halitosis had further improved, but the patient felt dry mouth. The tongue was pale red with a thin yellow coating, and the pulse was thin. The previous formula was modified by removing *Curcuma longa* and *Nelumbo nucifera* leaf and adding 10 g of *Rehmannia glutinosa* (raw) and 10 g of *Fructus Mori*. Another seven doses were prescribed. On the fourth visit on July 30, 2023, all symptoms had disappeared. Observing that the patient was slightly overweight, the previous formula was modified by removing *Coicis semen* and *Amomum tsao-ko* and adding 15 g each of *Gynostemma pentaphyllum* and *Bupleurum chinense*. Seven doses were prescribed to consolidate the therapeutic effect.

6. Conclusion

Numerous clinical cases abound. In summary, for the treatment of Functional Gastrointestinal Disorders (FGIDs), the beneficial integration of Western and Traditional Chinese Medicine concepts of “Qi, Acid, Bacteria” is key to constructing a harmonious gastrointestinal ecosystem and often yields significant clinical results. It is hoped that this article can provide a new approach to the treatment of functional gastrointestinal diseases.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Gastroenterologist Branch of Chinese Medical Doctor Association, Gastrointestinal Dynamics Group of Digestive Disease Branch of Chinese Medical Association, 2010, Investigation on the Current Status of Clinical Diagnosis and Treatment of Dyspepsia Symptoms in 17 Provinces and Cities in China. *Chinese Journal of Practical Internal Medicine*, 30(11): 989–991.
- [2] Tian L, 2007, Discussion on the Prokinetic Mechanism of Seven Qi-Regulating Traditional Chinese Medicines Including *Areca Catechu Peel*, thesis, Nanjing Medical University.
- [3] Tao M, Yan Y, Chen L, et al., 2017, Comparative Analysis of the Components of *Arca Subcrenata* Shell and Its Adulterants. *Traditional Chinese Medicine and Clinical Pharmacology*, 8(6): 5–9.
- [4] Zhong G, 2016, *Chinese Materia Medica*. Beijing: China Press of Traditional Chinese Medicine: 318–319.
- [5] Chen W, Wang G, Wu Q, et al., 1990, Chronic Hyperacidity Secretion Model in Rats and Pharmacological Experiments with Traditional Chinese Medicine. *Journal of Guangzhou University of Traditional Chinese Medicine*, 1990(03): 178–181.
- [6] Guarner F, Malagelada J, 2003, Gut Flora in Health and Disease. *Lancet*, 361: 512–519.
- [7] Huang Y, 2010, Detection of Gastrointestinal Flora and Gastrointestinal Mucosal Barrier. *Chinese Journal of Practical Pediatrics*, 25(07): 516–519.

- [8] Zhou L, Dai G, 2020, Research Progress on the Treatment of Gastrointestinal Diseases with Traditional Chinese Medicine Based on Intestinal Flora. *Smart Health*, 6(08): 39–42.
- [9] Wang H, 2020, Research on the Effects of Traditional Chinese Medicine on the Growth of Probiotics and the Design and Optimization of Traditional Chinese Medicine-Probiotic Compound Microecological Preparations, thesis, Jilin University.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.