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Exploration on the Regulatory Effect of Shenling Baizhu Powder on Intestinal Microecology based on the Gasification of Spleen and Stomach

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Abstract: ***Intestinal dysbiosis is an important mechanism of intestinal diseases, and maintaining the balance and homeostasis of intestinal flora is crucial for the treatment of many intestinal and extraintestinal diseases. At the same time, spleen and stomach gasification disorders are important basic pathogenesis of various diseases, which are manifested in the abnormal rise and fall of qi and the obstruction of water and grain fine transport and distribution. Studies have confirmed that traditional Chinese medicine has a good regulatory effect on the intestinal microecology, which can regulate the gasification function of the spleen and stomach, regulate the structure of intestinal flora in multiple ways, and promote the recovery of intestinal mucosal function, so as to regulate and treat related diseases. Intestinal flora is one of the material bases for spleen and stomach gasification, and it is of great significance to explore the regulatory effect of traditional Chinese medicine on the intestinal microecology, which is of great significance for the prevention and treatment of intestinal and extraintestinal related diseases.***

Keywords: Spleen and stomach gasification, Intestinal microflora, Shenling Baizhu San.

1. Introduction

Gasification is the most basic feature of life, the spleen and stomach are the source of qi, the lungs are the main qi, and the kidney is the root of qi. "Suwen Liujiao Tibetan Elephant Theory" says: "The spleen, stomach, large intestine, small intestine, sanjiao, and bladder are the foundation of the granary and the dwelling of the camp, called the instrument, which can dissolve the dross and turn the taste in and out" [1]. Only when the functions of the internal organs are normal and coordinated with each other can the gasification process be maintained in an orderly manner and the normal progress of life activities can be promoted, and Li Dongyuan's view that "internal damage to the spleen and stomach, and all diseases arise from it" also reflects the key role of the spleen and stomach in the gasification process. The intestinal flora interacts with the host to regulate immunity, resist colonization by pathogenic microorganisms, and maintain normal physiological functions of the intestine. By regulating the gasification function of the spleen and stomach, Shenling Baizhu Powder can differentiate and treat irritable bowel syndrome, functional constipation and other related diseases, and the clinical effect is certain. Therefore, it is of great foundation and clinical significance to study how traditional Chinese medicine affects the intestinal microecology and promote the repair of intestinal mucosal barrier damage and its functional recovery. Therefore, this paper discusses the effect of Shenling Baizhu Powder on the intestinal microecology from the connotation of spleen and stomach gasification.

2. Spleen and Stomach Gasification

Gasification is the essence of human life activities and runs through the entire life process. Gasification refers to various changes caused by the movement of qi, which can lead to the metabolism and transformation of fine substances such as essence, qi, blood, and body fluids. If after eating, through the digestion and absorption of the body, it will turn into dross, which is also a specific manifestation of gasification. The excitation and maintenance of the process of gasification depend on the function of the organs. If the gasification function is abnormal, it will affect the function of the organs and the metabolism of substances. Specifically, it can be discussed from two aspects: the spleen and stomach as the source of qi and blood biochemistry and the hub of the rise and fall of qi.

2.1 The Spleen and Stomach are the Foundation of Qi

"Lingshu Jueqi" says: "The six qi have their own masters, and their nobility, poverty, good and evil can be the constant masters, but the grains and stomach are the sea." It is believed that the six qi of essence, qi, body, liquid, blood, and pulse are all metamorphosed by the essence of grains, and the spleen can be mainly transported and lifted, while the stomach is mainly accepted and mainly reduced turbidity, and the spleen and stomach are coordinated to jointly complete the digestion and absorption of food and drink, so as to convert it into water and grain fine substances. And the essence of water and grain metamorphosis from the spleen and stomach can nourish the vitality in the kidneys, and can also be transformed into ancestral qi, wei qi and ying qi. Therefore, the spleen and stomach are the source of the biochemistry of the six qi and the foundation of the day after tomorrow. "Suwen Meridian Theory" says: "Drink into the stomach, overflow essence, and lose to the spleen." The spleen qi disperses essence, returns to the lungs, regulates the waterway, and goes down to the bladder [2]. The process of transferring water and drinking water is discussed, reflecting that the gasification of the spleen and stomach participates in a series of processes of digestion, absorption, and transfer of water and grain. The spleen and stomach theory advocated by Li Dongyuan also believes that the spleen and stomach are the foundation of vitality, which also reflects the importance of spleen and stomach gasification in human life activities.

2.2 The Spleen and Stomach are the Hubs of the Rise and Fall of the Qi Machine

The qi machine is the prerequisite for the gasification process to occur and proceed, as stated in the "Suwen Six Micro Principles": "If the entry and exit are wasted, the divine machine will disappear, and if the rise and fall of the breath, the qi will stand alone and dangerous." Therefore, if it is not in and out, there will be no growth, growth, and old age; If it is not a rise or fall, there will be no growth or transformation collection [3]. "If the rise and fall of qi is abnormal, it will lead to various diseases, if the rise and fall of qi stops, gasification will also be terminated, and the life activities of the human body will end." the spleen is mainly cleared, so that the essence of water and grain can be transported up to the heart and lungs, and the stomach can accept the rotten water grain; The stomach mainly reduces turbidity, of which turbidity reduction is the premise of acceptance, which can make the water valley go down without the risk of stagnation. The rise and fall of the qi of the spleen and stomach is the hub of the rise and fall of the qi machine, so that the spleen and stomach can play a physiological function of coordinating with the movement of the spleen and stomach. In the "Suwen Linglan Secret Classic": "The small intestine is the official who receives the abundance, and the transformation comes out of it"; "The large intestine is the organ of conduction, and the changes come out." It can be seen that the intestine is also involved in the gasification of the spleen and stomach [4].

3. Intestinal Microflora

The gut microecology is composed of bacteria, fungi and viruses, also known as the second genome of the human body. Probiotics in the intestinal flora, such as various bifidobacteria, lactobacilli and other anaerobic bacteria, play an important role in the digestion process of food, and prevent the contact between pathogenic bacteria and intestinal epithelial cells, and can also synthesize vitamins and decompose harmful substances; Conditional pathogenic bacteria such as Escherichia coli are beneficial to the human body under normal conditions, but if the value is uncontrolled or transferred from the intestines to other parts of the body, it will cause some diseases; Harmful bacteria such as dysentery bacillus and salmonella can cause various diseases or affect the function of the body's immune system [5].

The intestinal microecology can affect the nutrition, metabolism, immunity, development and aging of the body, and also have a mutual regulation and influence effect with the intestinal mucosal barrier, so the intestinal microecology is related to metabolic diseases, immune-related diseases and other chronic diseases, and these microorganisms also form an interdependent and dependent symbiotic relationship with the body. Intestinal microorganisms have metabolic functions, can secrete complex proteases, and can also promote the decomposition of food components, and at the same time decompose, metabolize or transform other endogenous and exogenous substances; nutritional function, can synthesize a variety of vitamins, amino acids, peptides, short-chain fatty acids; Host immune function can regulate the development and maturation of human immune organs and stimulate the body's immune response. Intestinal defense function, gut microbes can resist the invasion and colonization of foreign pathogens, and maintain the normal barrier function of the intestinal mucosa and its structural integrity [6].

4. From the Perspective of Intestinal Microecology, the Gasification of the Spleen and Stomach is Discussed

4.1 Digestion, Absorption and Metabolism of Substances

The intestinal flora promotes intestinal peristalsis and the digestion and absorption of nutrients in the body, participates in the metabolism of endogenous proteins, and enables the body to obtain the necessary vitamins, amino acids, lipids and carbohydrates from the intestinal flora. The intestinal flora can participate in the digestion, absorption and metabolism of substances, which is similar to the process of the rise and fall of the spleen and stomach, the generation, transport, transport and metabolism of fine substances in water and grains. Under the transport function of the spleen, the fine substances are absorbed and the absorbed water and grain essences are transferred to the whole body and nourished the whole body, which can be transformed into essence, qi and blood, body fluids to support the whole body, and the part that is not absorbed is transmitted down to the small intestine for further digestion and absorption of fine substances and water, and the food residue is sent down to the large intestine, which forms feces and excretes after absorbing its water, so the spleen and stomach are the source of qi and blood biochemistry.

4.2 Immune Barrier Function and Play a Protective Role on the Body

The intestinal flora protects the normal histology and anatomical structure of the human body, such as Escherichia coli and Clostridium difficile pathogenic bacteria can increase the permeability of the intestine [7], while probiotics can upregulate the expression of proteins such as occludin and ZO-2 that make up the intestinal mucosal barrier, thereby enhancing the integrity of the intestinal mucosal barrier [8]. Because the probiotics and harmful bacteria of the intestinal flora maintain a relative balance, the two are opposed and unified, and the intestinal microecology can perform its function and interact with the human body. Therefore, the immune barrier function of the intestinal microecology is related to the gasification of the spleen and stomach, which is similar to the overall concept of traditional Chinese medicine, which is also a concrete embodiment of "righteousness exists inside, evil cannot be done". The spleen and stomach are the source of qi and the foundation of the day after tomorrow, which can provide a material basis for essence, qi, blood and fluids, so that righteousness is vigorous, and play an important role in resisting, eliminating diseases and preventing diseases.

If the gut microbiome is imbalanced, the type, number, proportion, and biological characteristics of the flora will change, which will affect human health [9]. Disorders of intestinal flora will cause clinical manifestations of the digestive system such as gastrointestinal discomfort. This also has certain similarities with spleen and stomach gasification disorders. Spleen and stomach gasification disorders will cause symptoms caused by various spleen and stomach gasification disorders, such as nausea and vomiting, loss of appetite, loose stools, etc., spleen deficiency and dampness

and dampness will cause abdominal fullness, loose stools, and heavy limbs. Spleen loss will also affect the publicity of the lungs, resulting in cough and phlegm, edema and other symptoms. The spleen is out of health, and the internal stagnation of water and dampness will lead to the loss of drainage in the liver, resulting in flank swelling and pain, jaundice and other symptoms. The spleen is not healthy, and the production of water and grain essence is insufficient, so that the kidney essence is insufficient, and the waist and knees are sore and weak. Therefore, it is also an important method and effective way to understand the treatment of diseases related to spleen and stomach gasification disorders from the perspective of intestinal microecology.

5. The Regulatory Effect of Shenling Baizhu Powder on the Intestinal Microecology

Ginseng Ling Baizhu is dispersed from the "Taiping Huimin and Pharmacy Bureau Formula", which is composed of ginseng, poria, atractylodes, yam, sand kernel, barley, lotus seeds, platycodon flower, lentils, jujube, roasted licorice, etc. This prescription is effective in nourishing qi and strengthening the spleen at the same time, and also has infiltration and antidiarrhea, and is compatible with various medicines, which can restore the function of spleen and stomach transport and chemistry, so as to treat diseases related to spleen and stomach gasification disorders. Studies have confirmed the effect of single-flavor drugs on the intestinal flora: such as sand kernels, the number of lactobacilli in the intestine can be restored and become the dominant flora, improving the diversity of intestinal flora [10]. Ginseng polysaccharides not only regulate the intestinal microecology, but also promote the absorption rate of ginsenosides in the intestine and maintain the balance of the intestinal microbiome [11]. Poria oligosaccharides [12] promote the growth of beneficial bacteria and inhibit harmful bacteria, which can increase the abundance and diversity of intestinal flora and maintain the balance of intestinal flora. Yam could increase the relative abundance of Firmicutes. reduce the relative abundance of Bacteroidetes and Proteobacteria [13]. Atractylodes and its products can change the types of intestinal microbes, increase the proportion of beneficial bacteria, and regulate intestinal microbes [14]. Shenling Baizhu Powder can improve the intestinal environment and intestinal mucosal microcirculation, and maintain the balance of the intestinal microecological environment. Its role is mainly discussed from the following two aspects:

5.1 Regulates Intestinal Flora Structure

Shenling Baizhu powder can increase the proportion of beneficial bacteria in the intestine and inhibit the number of pathogenic bacteria, thereby repairing the damaged intestinal mucosal barrier [15]. Luo Liang [16] found that the relative abundance of Trichococcaceae, Vibrio desulfurization, and Oxalate spp. increased significantly, while the relative abundance of Enterococcus, Helicobacterium, and Deferrocacteriaceae decreased. In addition, by increasing the relative abundance of short-chain fatty acid-producing bacteria and probiotics, and reducing the relative abundance of lactic acid-producing bacteria, mucin-producing bacteria and other pathogenic bacteria, the microbiota structure after the intervention of Shenling Baizhu Powder was closer to the normal flora than that after natural recovery. The results of Hongli's study found that [17]: The mechanism of action of Shenling Baizhu Powder can be manifested in the increase of Bifidobacterium and Lactobacillus spp., the decrease of Helicobacter pylori spp., and the change of intestinal short-chain fatty acid content. Among them, lactic acid bacteria can inhibit the proliferation of harmful bacteria and enhance gastrointestinal barrier function [18]. However, when Bifidobacterium long and Bifidobacterium breve are co-cultured, the metabolic changes of the intestinal flora can be improved by increasing the production of SCFAs to affect the metabolic changes of the intestinal flora [19]. There is also butyric acid in its common metabolite short-chain fatty acids, which inhibits the harm of high-fat diets to the human body [20]. Another study [21] found that the relative abundance of Firmicutes and Proteus in UC rats could increase and decrease the relative abundance of Bacteroidetes in UC rats, and the changed microbiota structure was closer to the normal state than that of the TNBS group, indicating that Shenling Baizhu Powder could inhibit inflammation by regulating the balance of intestinal flora.

5.2 Regulates the Metabolic Function of Intestinal Flora

Shenling Baizhu Powder can reduce the content of endotoxins, regulate enzyme activity, and regulate basal metabolism by down-regulating the content of pathogenic bacteria. Mao Menglin [22] found that Shenling Baizhu San can effectively regulate the abundance and diversity of the total intestinal flora and intestinal short-chain fatty acid-producing flora (mainly butyrate-producing bacteria) in rats with spleen qi deficiency, and increase the abundance of probiotics, which is the main metabolite of butyric acid-producing bacteria and an important mediator for its biological effects [23]. Butyric acid is the basic substance of intestinal energy source, which can promote the repair of intestinal mucosal tissue, intervene in the occurrence or treatment of intestinal diseases, and play an important role in maintaining the balance of intestinal microecology [24]. Dong Kaizhong et al. [25] found a correlation between intestinal flora and intestinal endotoxin, inflammatory factors, and gastrointestinal hormone levels, and that Shenling Baizhu Powder had a significant inhibitory effect on the growth of pathogenic bacteria or conditional pathogenic bacteria, and also had a certain promotion effect on beneficial bacteria such as lactobacilli in the intestine. The results of Li Yilin [26] showed that there were significant differences in intestinal microbiota function between patients with spleen deficiency and dampness diarrhea-type irritable bowel syndrome before and after treatment with Shenling Baizhu San. The KEGG pathway with differential metabolite enrichment between healthy controls and the spleen deficiency and dampness diarrhea irritable bowel syndrome group includes tryptophan metabolism, neuroactive ligand-receptor interactions, sulfur metabolism, biosynthesis of primary bile acids, ABC transporters, and metabolic pathways. The therapeutic effect of Shenling Baizhu Powder in these patients may be related to the regulation of arachidonic acid metabolism, phenylalanine metabolism, purine metabolism, arginine and proline metabolism pathways, and biosynthetic pathways of primary bile acids.

In summary, intervention with Shenling Baizhu Powder can improve intestinal structure and function. A large number of

relevant clinical studies can confirm that the clinical application of this prescription for intestinal diseases can effectively alleviate patients' clinical symptoms, promote the recovery of immune function, promote the repair of intestinal damage to mucosa, improve the quality of life of patients and reduce the recurrence rate of diseases. At the same time, the combination of this prescription on the basis of anti-tumor for cancer patients can also reduce toxicity and increase efficiency, which helps improve the prognosis of patients [27].

6. Conclusion

The gasification of the spleen and stomach and the intestinal microecology are closely related to the physiological and pathological mechanisms of the human body, and traditional Chinese medicine can regulate the vaporization function of the spleen and stomach to maintain balance in the intestinal microecosystem. Just as Shenling Baizhu San has the effect of nourishing qi and strengthening the spleen, infiltrating dampness and stopping diarrhea, because it contains a variety of active ingredients, it can act on the intestinal flora in multiple ways, and maintain the balance of the intestinal microecology by restoring the structure and function of the intestinal flora, thereby playing a role in treating related diseases. This is of positive significance for the improvement of the connotation of spleen and stomach-related theories and the exploration of the action of traditional Chinese medicine. In subsequent research, more high-quality experiments and studies can be carried out to provide a theoretical basis for this, so as to guide clinical treatment.

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