DOI: 10.53469/jcmp.2024.06(07).43

Discussion on the Treatment of Diarrhea by Ginseng-lingbaijutsu-san

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Abstract: ***Shenling Baizhu Powder (SLBZP), an essential formula in traditional Chinese medicine (TCM), possesses profound effects in tonifying the spleen and stomach, as well as benefiting lung qi. Diarrhea, characterized by increased bowel movements and loose stool consistency, represents a common clinical manifestation. This paper delves into the historical origins, evolution, and clinical therapeutic effects of SLBZP on diarrhea, aiming to elucidate its underlying mechanisms and contribute to the advancement of TCM.***

Keywords: Shenling Baizhu Powder, Spleen-Qi Deficiency Diarrhea, Traditional Chinese Medicine, Review.

1. Historical Background of Shenling Baizhu Powder

The formulation of Shenling Baizhu Powder (SLBZP) is well-documented in ancient TCM pharmacopoeias, originating from the renowned classic "Taiping Huimin Heji Jufang" [1]. Derived from the foundational Sijunzi Decoction with modifications and additions, including Amomum Villosum (Sha Ren), Platycodon Grandiflorum (Jie Geng), and Coicis Semen (Yi Yi Ren), SLBZP exhibits remarkable effects in nourishing the spleen and stomach, as well as harmonizing stomach qi and resolving dampness [2]. In ancient times, it was frequently prescribed for symptoms such as diarrhea or loose stools due to spleen qi deficiency [3], and for conditions like cough and dyspnea arising from lung qi deficiency. With the progression of medical science, a deeper understanding of this formula has led to its application in treating a broader range of diseases, achieving satisfactory clinical outcomes. The pathogenesis of diarrhea, fundamentally rooted in spleen and stomach weakness, results in impaired water metabolism, leading to increased bowel movements and watery stools.

2. Concept of Diarrhea

Diarrhea is defined by a marked increase in bowel frequency compared to usual habits, accompanied by loose stool consistency and increased water content. Its primary symptoms encompass alterations in bowel movements, particularly increased frequency and changes in stool form [4], often accompanied by symptoms like incontinence, urgency, and anal discomfort, significantly impacting patients' quality of life. In Western medicine, diarrhea is typically managed with anti-diarrheal agents, adsorbents, or gastric mucosal protectants, aiming to reduce gut motility and protect the gastrointestinal mucosa [5]. However, these treatments often lead to recurrence, addressing symptoms rather than underlying causes.

Diarrhea can be categorized into acute and chronic forms based on its duration. Chronic diarrhea, which typically persists for at least four weeks and often for 6-8 weeks [6], is known as "Xiexie" in TCM. The primary etiology of chronic diarrhea, particularly the most common type—spleen-qi deficiency chronic diarrhea—lies in spleen deficiency.

While TCM does not have a direct term equivalent to "diarrhea," its clinical manifestations can be attributed to complex pathogenic mechanisms. Generally, these mechanisms can be classified into internal and external factors. The internal factor pertains to spleen and stomach weakness, leading to dysfunction in water-grain essence transportation. When the spleen fails to transform water-grain essence, the stomach's descending function is impaired, allowing dampness to accumulate in the spleen, stomach, and intestines, ultimately causing diarrhea. External factors include invasions by exogenous pathogens, such as the six climatic excesses or improper dietary habits, which also contribute to diarrhea. Early TCM texts like the "Huangdi Neijing" and "Jingyue Quanshu" have discussed the causes of diarrhea, including dietary injuries and seasonal pathogenic influences, emphasizing the role of cold or raw foods in triggering diarrhea. "Shenshi Zunsheng Shu" further states that diarrhea is a disease of the spleen and stomach, resulting from impaired dampness excretion, leading to water entering the large intestine and causing diarrhea [7]. In summary, although the etiologies of diarrhea are diverse, including spleen and stomach weakness, cold pathogen invasion, damp-heat accumulation, improper diet, and liver qi stagnation, spleen and stomach weakness remains the core underlying factor.

The spleen and stomach are crucial for the ascending and descending of water-grain essence. As stated in "Jingyue Quanshu" [8], "The root of diarrhea always lies in the spleen and stomach" [9]. This phrase implies that the primary cause of diarrhea is the dysfunction of spleen and stomach in transporting and transforming water-grain essence. Internal or external factors weakening the spleen and stomach can lead to the accumulation of dampness, ultimately causing diarrhea. By tonifying spleen and stomach qi, eliminating dampness [10], and regulating qi flow, SLBZP addresses these underlying mechanisms, restoring normal physiological functions of the spleen and stomach, and thus alleviating or curing diarrhea.

3. Therapeutic Effects of Shenling Baizhu Powder

3.1 Treatment of Functional Dyspepsia

Functional dyspepsia, in Western medicine, refers to a disorder of gastrointestinal function in the stomach and duodenum, primarily manifested by postprandial fullness or epigastric burning sensations [11]. Imbalances in gut microbiota have been identified as a crucial factor and a significant therapeutic target in the management of functional dyspepsia [12]. In traditional Chinese medicine (TCM), the etiology of functional dyspepsia can be summarized as follows: firstly, splenic qi deficiency, which impairs the spleen's ability to transform and transport dampness and other pathogens, leading to the accumulation of dampness within the body, further affecting the spleen's functions and exacerbating diarrhea. Secondly, internally generated dampness and turbid qi can obstruct the middle-jiao (central region of the body, including the spleen and stomach), disrupting qi circulation and impairing the spleen's ability to ascend refined grains and the stomach's function to descend turbid fluids, ultimately causing diarrhea. The treatment approach involves strengthening the spleen and stomach's water-dampness transformation and regulating qi flow to alleviate qi stagnation. Wang Wei [13] conducted a clinical comparative study involving 80 patients with diarrhea, administering Shenling Baizhu Powder to the experimental group and conventional antidiarrheal medications to the control group (78 patients). The results demonstrated a significantly higher treatment efficacy in the experimental group (90%) compared to the control group (75%) ($P<0.05$). Xu Dawen et al. [14] modified Shenling Baizhu Powder based on specific syndromes, such as adding Chuanxiong for blood stasis and Cangzhu for excessive dampness.

3.2 Treatment of Diarrhea

Diarrhea is commonly understood as a condition resulting from excessive accumulation of fluids in the intestines due to various causes, leading to imbalances in the metabolic functions of the spleen, stomach, and other viscera. Li Li [15] observed the clinical effects of modified Shenling Baizhu Powder in treating 38 cases of chronic diarrhea. Tailored treatments were provided based on individual symptoms, such as adding Muxiang for abdominal distension and Wuweizi for morning diarrhea (wugeng xie). The control group received pipemidic acid and multienzyme tablets orally. Patients with dehydration due to diarrhea in both groups were additionally treated with oral rehydration solution. The results showed a significantly higher overall treatment efficacy in the experimental group compared to the control group. Liang Xiaojuan et al. [16] found Shenling Baizhu Powder suppositories to be effective in treating diarrhea in children during autumn and winter. Zhang Ying et al. [17] compared the clinical outcomes of 68 children with spleen-stomach weakness-type diarrhea, dividing them into two groups: an experimental group (34 children) treated with Shenling Baizhu Powder and a control group (34 children) treated with lactobacillus tablets. The results indicated significantly higher clinical efficacy in the experimental group treated with Shenling Baizhu Powder [18].

4. Mechanism of Action of Shenling Baizhu Powder

Advancements in medical research have deepened our understanding of Shenling Baizhu Powder's therapeutic mechanisms. It exhibits anti-diarrheal, analgesic, and gastroprotective effects [19], modulates gastrointestinal motility, regulates the gastrointestinal tract, prevents gut microbiota imbalances, and enhances the body's immune function to some extent.

4.1 Regulation of Gastrointestinal Motility:

Abnormal gastrointestinal motility is a core mechanism underlying intestinal diseases, characterized by increased sensitivity to external stimuli and heightened pain perception. Pharmacological and clinical studies have shown that small doses of Baizhu (Atractylodes macrocephala Koidz.), a key component of Shenling Baizhu Powder, can slow down gastrointestinal motility, thereby reducing diarrhea frequency and improving symptoms. The efficacy of Baizhu is attributed to its lipid and oil content, which reduce the excitability of gastrointestinal smooth muscles. Conversely, its volatile oils have a stimulatory effect on smooth muscles. Research and clinical trials can explore ways to alter Baizhu's targets to enhance the overall efficacy of Shenling Baizhu Powder, reinforcing its spleen-nourishing and diarrhea-alleviating properties [20].

4.2 Protective Effects of Shenling Baizhu Powder on Gastrointestinal Mucosa and Its Therapeutic Implications in Gastrointestinal Disorders

The preservation of gastrointestinal (GI) mucosa integrity, widely recognized as a pivotal pathological mechanism in irritable bowel syndrome (IBS) [21][22][23], has garnered significant attention from both laboratory and clinical investigations. These studies consistently reveal varying degrees of GI mucosal damage among IBS patients. Shenling Baizhu Powder (SBP), a traditional Chinese medicine, exerts its therapeutic effects in this context primarily by modulating the cellular components of the GI mucosa and reducing its permeability, thereby protecting and restoring the mucosal barrier. Research aimed at improving the intestinal microbiome has further illuminated the intricate interplay between IBS and the gut microbiota. IBS patients exhibit notable alterations in their intestinal microbial environment, characterized by a decline in beneficial bacteria such as Bifidobacterium [24][25] and Lactobacillus, and a concomitant increase in potentially harmful Enterobacteriaceae. Notably, SBP has been shown to enhance the abundance of probiotics in the human body [26], contributing significantly to the maintenance of a healthy microbial community. Additionally, SBP exerts a moderating influence on pathogenic and detrimental bacteria, demonstrating its ability to regulate the GI microbiota bidirectionally, fostering a relative balance between beneficial and harmful microorganisms. Enhancing the body's innate immune function is another crucial aspect of SBP's therapeutic potential. A clinical study by Song et al. [27] involving 80 patients with Crohn's disease revealed that SBP significantly bolstered the patients' immune systems. Experimental findings corroborated these clinical observations, demonstrating SBP's capacity to suppress inflammatory symptoms and augment immune responses. Notably, compared to the model group, SBP-treated mice exhibited a significant increase in body weight ($P<0.05$), accompanied by a reduction in the frequency of loose stools

and diarrhea episodes (P<0.05) [28]. Furthermore, SBP has demonstrated its efficacy in mitigating adverse reactions associated with GI medications, such as montmorillonite powder, while enhancing therapeutic outcomes. Clinical trials comparing the combined use of SBP and montmorillonite powder to montmorillonite powder alone in the treatment of diarrhea found that the former regimen reduced the incidence of adverse drug reactions, improved treatment success rates [29], and alleviated patients' symptoms.

5. Conclusion

In conclusion, SBP has achieved remarkable therapeutic outcomes in the treatment of diarrhea [30], known as "xiexie" in traditional Chinese medicine, by ameliorating clinical manifestations and bolstering immune function. Western medicine often addresses the symptoms of diarrhea without addressing its underlying causes, whereas SBP's mechanism of action suggests a holistic approach. Therefore, we advocate for an integrative medicine approach, combining the rapid symptomatic relief of Western medicine with the holistic treatment principles of traditional Chinese medicine, to contribute to the advancement of medical science and the well-being of our nation's populace. While this review comprehensively discusses SBP's therapeutic potential in diarrhea, it acknowledges the limitations of incomplete data and the restricted scope of clinical study participants, emphasizing the need for further research to address these shortcomings.

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