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Research Article

Clinical Effect of Yin Yang Regulating Moxibustion on Diarrhea-predominant Irritable Bowel Syndrome

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Keywords: Yin-Yang regulating moxibustion; Diarrhea irritable bowel syndrome; IBS-D; Brain-gut peptide; Intestinal microbiota

Abstract

Objective: To evaluate the clinical effect of Yin Yang regulating moxibustion on diarrhea-predominant irritable bowel syndrome（IBS-D） and explore its therapeutic mechanism.

Methods: Sixty patients with diarrhea irritable bowel syndrome (December 2022 to December 2023) were divided randomly and averagely into a control group and an observation group using a random number table method. The control group was given a trimebutine maleate capsule, while the observation group was given Yin Yang regulating moxibustion in addition to oral trimebutine maleate capsules. The treatment course was 4 weeks. Observation or detection indicators: Irritable Bowel Syndrome Severity Score (IBS-SSS), gut microbiota structure and diversity, brain gut peptide indicators (5-HT, SP, NPY), safety before and after treatment in both groups of patients.

Results: There was no statistically significant difference in the symptom severity score, gut microbiota structure and diversity, and brain gut peptide levels between the two groups before treatment ($p > 0.05$). After treatment, the symptom severity scores of both groups of patients were lower than before treatment, and the treatment group had lower scores than the control group, with statistical significance ($p < 0.05$). After treatment, the Simpson index of the treatment group was lower than before treatment, and the Shannon index was higher than before treatment, with statistical significance ($p < 0.05$). The Simpson index of the control group was lower than before treatment, and the Shannon index was higher than before treatment, with no statistical significance ($p > 0.05$). Inter-group comparison showed that the Simpson index of the treatment group was lower than that of the control group, and the Shannon index was higher than that of the control group after treatment, and the differences were statistically significant. After treatment, the serum levels of 5-TH and SP in both groups were lower than before treatment, and the treatment group was lower than the control group, with statistically significant differences ($p < 0.05$). The serum NPY levels were higher than before treatment, and the treatment group was higher than the control group, with statistically significant differences ($p < 0.05$). During the treatment process, neither group of patients experienced skin allergies or serious adverse reactions related to the treatment.

Conclusion: Yin-Yang regulating moxibustion is safe and effective in treating diarrhea and irritable bowel syndrome, and is worthy of clinical promotion. Its therapeutic mechanism may be related to its regulation of brain-gut peptide levels and improvement of intestinal microbiota.

Introduction

Irritable bowel syndrome (IBS) is a clinical syndrome characterized by abdominal pain, bloating, or discomfort, which is related to bowel movements or accompanied by changes in bowel habits such as frequency and/or stool characteristics. Organic lesions that may cause these symptoms have been ruled out through clinical examination. The overall prevalence of IBS in the general population in China is 1.4% - 11.5%, with a slightly higher prevalence among females than males; IBS occurs in all age groups, but is more common in middle-aged and young people (aged 18 - 59) [1]. By the standard of Rome IV, IBS is divided into four subtypes: diarrhea type (IBS-D), constipation type (IBS-C), mixed type (IBS-M), and unclassified type (IBS-U) according to the main abnormal stool characteristics of patients (refer to Bristol stool characteristics scale) [2]. The incidence of IBS-D is the most common, accounting for 30% - 40% of the incidence rate of

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IBS [3]. IBS-D is characterized by more than 1/4 of all abnormal bowel movements (calculated by days) being classified as type 6 or 7 on the Bristol scale, and less than 1/4 of abnormal bowel movements being classified as type 1 or 2 on the scale. IBS seriously affects the quality of life of patients and increases the economic burden of families and society. Some IBS patients' quality of life is even worse than that of patients with diabetes or end-stage renal disease [4]. Research has shown that IBS-D patients have a greater tendency to have comorbidities of mental and psychological disorders, and their mental and psychological state can affect their quality of life. The more obvious the mental and psychological disorders, the larger the scope of the impact on their quality of life [5].

At present, the research on the pathogenesis of IBS-D in modern medicine is not clear, and its potential mechanisms include abnormal brain-gut axis interaction, dysbiosis of gut microbiota, visceral hypersensitivity, abnormal gastrointestinal motility, activation of the immune nervous system by low-grade inflammation of the gut, acute and chronic stress, etc [1]. So far. Western medicine has various shortcomings in the treatment of IBS-D, such as frequent adverse reactions and easy recurrence. Traditional Chinese medicine treatment for IBS-D is becoming increasingly popular due to its advantages of simplicity, convenience, effectiveness, and affordability. Clinical studies have shown that Yin Yang Regulating Moxibustion has significant therapeutic effects on IBS-D and has the advantages of low cost and no need for oral medication. However, its mechanism of action is currently not fully understood. Therefore, this study aims to investigate the regulatory effect of Yin Yang Regulating Moxibustion on the brain-gut axis and its impact on gut microbiota in patients with IBS-D. This will provide a scientific basis for further elucidating the mechanism of Yin Yang Regulating Moxibustion in treating IBS-D, and facilitate the clinical promotion and popularization of Yin Yang Regulating Moxibustion.

Study design

Diagnostic criteria: Diagnostic criteria of Western medicine: Referring to the diagnostic points of IBS-D in the "Rome IV Diagnostic Criteria for Functional Gastrointestinal Diseases" [6], including: recurrent abdominal pain or discomfort (non painful discomfort), symptoms occurring for ≥ 6 months, at least 3 days per month in the past 3 months, and consistent with the following two or more points: ① improvement of symptoms after defecation; ② the onset of the disease is accompanied by changes in the frequency of bowel movements; ③ the onset is accompanied by abnormal appearance of feces. Traditional Chinese Medicine Diagnostic Criteria: disease diagnosis (1) Diarrhea: Clear and thin stool texture is the primary condition for diagnosis, manifested as frequent bowel movements, thin stool texture, and even watery stool; or the frequency of bowel movements does not increase, and the texture of feces is clear and sparse; or the stool may have a clear and watery texture mixed with undigested food. There is often bloating and abdominal pain first, followed by diarrhea immediately. Sudden onset of diarrhea, with urgent and excessive diarrhea; long-term diarrhea has a slow onset, with a mild and small amount of diarrhea, and a history of recurrent episodes. (2) Liver depression and spleen deficiency syndrome: according to the "Consensus on Traditional Chinese Medicine Diagnosis and Treatment of Irritable Bowel Syndrome" [7], the main symptoms are: ① diarrhea immediately after abdominal pain, with reduced pain after diarrhea; ② emotional impatience and irritability. Secondary symptoms: ① swelling and discomfort in both sides of the lower abdomen; ② inability to absorb food; ③ fatigue and fatigue. Tongue pulse: the tongue texture is light and plump, which can also be manifested as tooth marks on the tongue, and the tongue coating is thin and white. The pulse is thin and the string is fine. Syndrome diagnosis: if there are 2 main symptoms, 2 secondary symptoms, and the tongue and pulse are consistent, the diagnosis can be confirmed.

Inclusion and exclusion criteria: The inclusion criteria need to meet the following criteria simultaneously: ① meet the diagnostic criteria of Western and Traditional Chinese Medicine mentioned above; ② age range: 18 - 60 years old; ③ IBS-SSS [8] score > 75 points, ④ those who have signed the informed consent form. Any of the following will be excluded: ① organic diseases in the intestinal tract or other diseases that affect the digestive function (such as cholecystitis, pancreatitis, renal dysfunction, nervous system diseases, endocrine system diseases such as thyroid dysfunction, diabetes, etc.); ② individuals with serious underlying diseases such as cardiovascular, liver, kidney, hematopoietic system, mental disorders, and cognitive dysfunction; ③ patients who have undergone surgery on the abdomen, rectum, or anus; ④ long term use of drugs that affect gastrointestinal function or motility; ⑤ women who are pregnant, breastfeeding, or have given birth for ≤ 12 months, as well as those with allergies; ⑥ those who have adopted other treatment plans that affect efficacy or safety assessment; ⑦ individuals allergic to moxibustion; ⑧ participants in other projects.

General information: The sample size estimation adopts the optimal design sample size estimation method: two equal parallel 1:1 designs are used. Based on the effectiveness rate of the preliminary experiment, 60 samples were ultimately included. Sixty patients with diarrhea-predominant irritable bowel syndrome with liver depression and spleen deficiency syndrome were enrolled in the inpatient and outpatient departments of Huanggang Central Hospital (Dabie Mountain Area Medical Center) from December 2022 to December 2023. They were randomly divided into a control group and a treatment group using a random number table, with 30 patients in each group. Compare clinical data of each group, including age, disease duration, gender composition, etc. Both groups of patients signed informed consent forms and were reviewed by the Medical Ethics Committee.

Ethical explanation: This research project has been reviewed by the Ethics Committee of Huanggang Central Hospital and has obtained informed consent from all participants, ensuring the protection of their privacy and data security.

Methods

Treatment methods: The control group was given orally with Trimebutine Maleate Capsules (manufacturer: Shanxi

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Zhendong Ante Biopharmaceutical Co., Ltd., production batch number: H20040713) for 4 weeks, 3 times a day, 0.1 g each time. The observation group received Yin Yang regulating moxibustion in addition to the control group, 2 times a week, with each treatment lasting 40 minutes for 4 weeks. The operation method of Yin Yang regulating moxibustion refers to the spleen strengthening and qi regulating moxibustion method in the Technical Operation Specifications for Yin Yang Regulating Moxibustion [9] jointly prepared by the Hubei Provincial Association of Traditional Chinese Medicine and the acupuncture and moxibustion Association, that is, moxibustion with moxa wool separated by ginger is applied within the range formed jointly by bilateral Qihaishu points to Geshu points, and bilateral Weicang points to Hunmen points to strengthen the spleen and regulate the stomach, regulate the qi and harmonize the middle.

Observation and detection indicators: ① General information: record the patient's age, gender, and duration of illness. ② Evaluation indicators for treatment effectiveness: the severity of clinical symptoms was evaluated before and after treatment using the IBS-SSS scoring scale. The severity of abdominal pain, frequency of abdominal pain, degree of bloating, satisfaction with bowel movements, and interference with daily life were scored in five aspects, with a total score of 100 points for each item and 500 points for the five items. The higher the score, the more severe the clinical symptoms. The severity standard is evaluated based on the score: (1) Normal: IBS-SSS is less than or equal to 75 points; (2) Mild: IBS-SSS score 76-175 points; (3) Moderate: IBS-SSS score 176-300 points; (4) Severe: IBS-SSS score greater than 300 points. ③ Diversity and structure of gut microbiota: Analyze using 16S rRNA sequencing technology. Collect feces from the control group and observation group, send some samples for immediate testing, culture, inoculate, and smear (fecal routine), and store the remaining specimens in a -80 ℃ freezer. Take 15-18 mg fecal samples and use the QIAamp DNA Stool Mini kit (QIAGEN company, Germany, 51504) to extract DNA. PCR amplification of the highly variable region (V3~V4) of the 16S rRNA gene. The sequences with a similarity greater than 97% are classified as operational taxonomic units (OTUs). Using the RDP classifier Bayesian algorithm for taxonomic analysis of OTU representative sequences, calculate the relative abundance of gut microbiota at the phylum level. Use the Mothur software to calculate Shannon and Simpson indices under different random samples to evaluate the diversity of gut microbiota. ④ Brain gut peptide indicators: serum 5-HT, SP, NPY, detected by enzyme-linked immunosorbent assay (ELISA), kit purchased from Elabscience company.

Statistical methods: The 60 patients with diarrhea-predominant irritable bowel syndrome included in this study were analyzed using the SPSS 25.0 system. Use the chi-square test for counting data; the measurement data of normal distribution is analyzed using the t-test ($\bar{x} \pm s$). The comparison between two groups of data is conducted using two independent t-test. The comparison between the same group before and after treatment is conducted using a paired sample t-test. Use the rank sum test to analyze non-normal distribution metric data and ordered rank data. All statistical inferences in this study were based on a two-sided test, with $p < 0.05$ considered statistically significant.

Results

Comparison of general information between two groups of patients

The comparison between the treatment group and the control group in terms of gender composition (male, female), age (years), and disease duration (months) showed no statistically significant differences ($p > 0.05$), indicating comparability (Table 1).

Comparison of IBS-SSS scores between the two groups of patients before and after treatment

Before treatment, there was no significant difference in IBS-SSS scores between the two groups of patients ($p > 0.05$). After 4 weeks of treatment, the IBS-SSS scores of both the treatment group and the control group decreased compared to before, and the difference was statistically significant ($p < 0.05$), with the treatment group showing a more significant decrease in scores ($p < 0.05$) (Table 2).

Comparison of gut microbiota diversity before and after treatment between the two groups

There was no significant difference in the diversity of gut microbiota between the two groups before treatment ($p > 0.05$). After 4 weeks of treatment, the Simpson index of the treatment group was lower than that of the control group ($p < 0.05$), and the Shannon index was higher than that of the control group ($p < 0.05$). After 4 weeks of treatment, the Shannon index of the treatment group was higher than before treatment ($p < 0.05$), and the Simpson index was lower than before treatment ($p < 0.05$); The Shannon index was higher and the Simpson index

Table 1: Comparison of gender, age, and process between the Two Groups of Patients.

group	n	Gender [Example (%)]		age	course of disease
		male	female	(year, $\bar{x} \pm s$)	(month, $\bar{x} \pm s$)
treatment group	30	13	17	36.40 ± 10.60	44.60 ± 27.37
control group	30	15	15	35.50 ± 10.23	43.63 ± 31.10
statistics		$X^2 = 0.268$		$t = 0.335$	$t = 0.128$
p		0.605		0.739	0.899

Table 2: Comparison of IBS-SSS scores between two groups of patients before and after treatment ($\bar{x} \pm s$)

group	n	IBS-SSS score		t	P	Difference
		before treatment	after treatment			
treatment group	30	329.33 ± 66.38	167.33 ± 38.77	16.538	0.000	166.67 ± 59.27
control group	30	313.33 ± 75.26	252.67 ± 70.76	8.135	0.000	60.67 ± 40.85
t		0.873	-5.793			8.066
P		0.386	0.000			0.000

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was lower in the control group after treatment compared to before treatment, and the differences were not statistically significant ($p > 0.05$), as shown in Figures 1,2.

Comparison of gut microbiota structure before and after treatment between the two groups: At the door level, the composition of gut microbiota was similar and comparable between the two groups before treatment ($p > 0.05$). After 4 weeks of treatment, the levels of Bacteroidetes and Proteobacteria in both groups were higher than before treatment, with statistical significance in the treatment group ($p < 0.05$), while there was no statistical significance in the control group ($p > 0.05$). The phyla Firmicutes and Actinobacteria in both groups decreased compared to before, with statistical significance in the treatment group ($p < 0.05$), while there was no statistical significance in the control group ($p > 0.05$). After 4 weeks of treatment, the treatment group showed higher levels of Bacteroidetes and Proteobacteria compared to the control group, and the difference was statistically significant ($p < 0.05$). The treatment group had significantly lower levels of Firmicutes and Actinobacteria compared to the control group ($p < 0.05$) (Figure 3).

Comparison of brain gut peptide levels before and after treatment between the two groups

Before treatment, the serum 5-TH, SP, and NPY levels of the two groups were comparable ($p > 0.05$). After 4 weeks of treatment, the serum levels of 5-TH and SP in the treatment group were lower than those in the control group, while the serum levels of NPY were higher than those in the control group, and the differences were statistically significant ($p < 0.05$). After treatment, the levels of serum 5-TH and SP in both groups decreased significantly compared to before treatment ($P<0.05$), while the levels of serum NPY increased significantly compared to before treatment ($p < 0.05$) (Table 3).

Both group did not experience burns, skin allergies, or serious drug-related adverse reactions during treatment and follow-up, indicating that both treatment methods are safe.

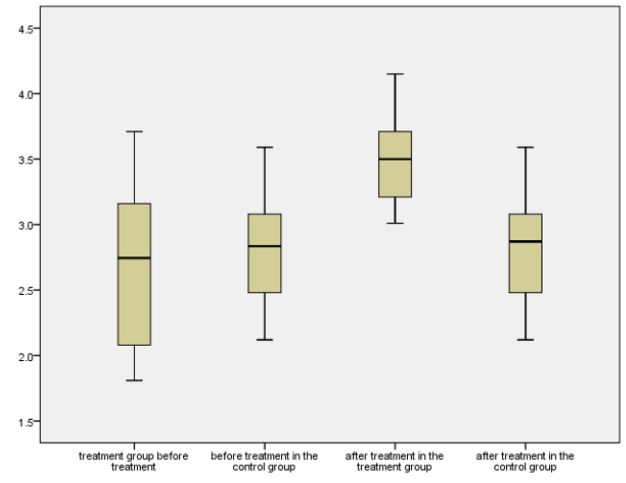

Figure 1: Comparison chart of Shannon index between two groups before and after treatment.

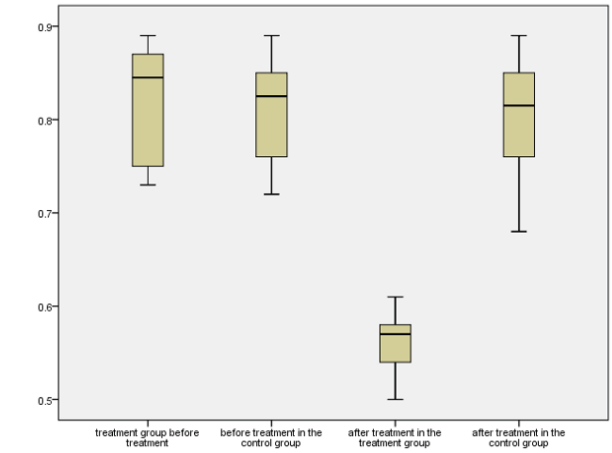

Figure 2: Comparison of simpson Index between two groups before and after treatment.

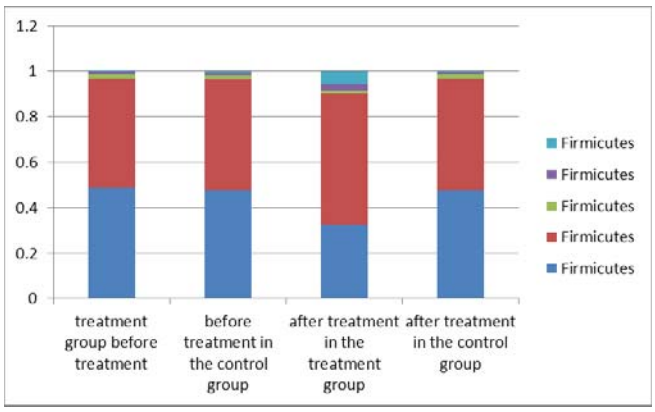

Figure 3: Comparison of gut microbiota structure before and after treatment between the two groups.

Discussion

IBS-D is a common chronic functional intestinal disease in clinical practice, and its pathological and physiological mechanisms are not yet fully understood. It is generally believed that it is caused by the abnormal interaction between the gut and brain due to the combined action of multiple factors, including visceral hypersensitivity, increased mucosal permeability, abnormal gastrointestinal motility, intestinal immune activation, intestinal microbiota disorder, abnormal processing of peripheral signals by the central nervous system, as well as the interaction and interconnection between peripheral and central factors [2,10]. The brain gut axis is a bidirectional regulatory pathway that exists between the central nervous system (CNS) and the gut, consisting of the central nervous system (CNS), enteric nervous system (ENS), autonomic nervous system (ANS), and hypothalamic pituitary adrenal axis (HPA axis) [11], in which neural, endocrine, and immune signaling mechanisms are involved [12]. The stimulation received by the central nervous system and peripheral nervous system is transmitted to the intestine through the ANS and HPA axes, regulating intestinal function. At the same time, when the intestinal environment changes, the enteric nervous system receives stimulation, and the neurotransmitters secreted by the intestine will also feed

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Table 3: Comparison of serum 5-TH, SP, and NPY before and after treatment between the two groups.

group	n	5-TH (ng/L)		t	p	SP (ng/L)		t	p	NPY (ng/L)		t	p
		Before treatment	After treatment			Before treatment	After treatment			Before treatment	After treatment		
Treatment group	30	96.24 ± 6.48	46.47 ± 5.37	60.676	0.000	109.25 ± 6.27	55.29 ± 6.26	52.411	0.000	30.34 ± 6.79	50.85 ± 5.97	-34.825	0.000
control group	30	95.32 ± 7.12	86.19 ± 5.32	10.089	0.000	108.70 ± 7.31	88.17 ± 6.11	48.287	0.000	31.58 ± 6.75	34.08 ± 7.33	-8.282	0.000
t		0.525	-28.786			0.311	-20.593			-0.711	9.719		
Neither		0.601	0.000			0.757	0.000			0.480	0.000		

back upwards to the ANS and CNS, resulting in corresponding symptoms. The gut microbiota is a large and diverse group of microorganisms in the human intestine, which plays a role in maintaining the stability of the intestinal environment [13]. Studies have shown that the diversity and structural disorder of gut microbiota, also known as gut dysbiosis, play an important role in the pathogenesis of IBS-D [14]. Moreover, in IBS patients, gastrointestinal dysbiosis is associated with visceral hypersensitivity, increased intestinal permeability, mucosal immune activation, chronic inflammation, chronic fatigue, emotional anxiety, and depression [15-20]. Some gut microbiota can stimulate the biosynthesis of colonic endocrine cells and the release of serotonin (5-hydroxytryptamine), thereby regulating intestinal motility, as demonstrated by Fusobacteria [21,22]. The decrease in short-chain fatty acid concentration caused by gut microbiota imbalance can increase intestinal inflammation and permeability, leading to IBS symptoms [23,24]. Therefore, the latest research further expands the concept of the brain-gut axis to the brain-gut microbiota axis, emphasizing the important mediating role of gut microbiota in the biological axis [25]. Disruption of the brain-gut microbiota axis is an important link in the pathogenesis of IBS, and restoring the normal regulation of the brain-gut microbiota axis is of great significance for the treatment of IBS [26]. Research has shown [27,28] that certain gut microbiota, including Firmicutes, Bacteroidetes, Actinobacteria, and Proteobacteria, are of significant importance for the prognosis of IBS-D. In terms of treatment, it is possible to improve intestinal inflammation, restore intestinal mucosal barrier function, and alleviate symptoms of IBS-D by regulating the levels of endogenous metabolites such as bile acids, short-chain fatty acids, and brain-gut peptides by affecting the abundance of bacteria with relatively significant changes. Brain-gut peptides are small-molecule substances with dual effects of neurotransmitters and gastrointestinal hormones, mainly present in the central nervous system, enteric nervous system, and endocrine cells of the gastrointestinal tract. They are important regulatory factors on the brain-gut axis. Abnormal secretion and expression of SP and 5-HT can lead to increased visceral sensitivity and gastrointestinal motility disorders [29,30], while NPY can inhibit smooth muscle contraction, regulate emotions, and have analgesic effects [31].

IBS-D can be included in the category of diarrhea in traditional Chinese medicine based on its clinical manifestations [7]. Its pathogenesis is based on congenital deficiency of nutrients, spleen deficiency, or acquired loss of nourishment, which can cause damage to the spleen and stomach. The main causes of the disease are the perception of external pathogens, dietary injuries, and emotional disorders [32]. This disease is located in the intestine, with the main organ being the spleen, which is closely related to the liver and kidneys. The basic pathogenesis is spleen deficiency and excessive dampness, leading to intestinal dysfunction and diarrhea. The spleen is responsible for the transformation of blood, likes dryness and dislikes dampness, and secretes turbidity and conduction in the intestines. If there is a congenital spleen and stomach weakness or acquired spleen and stomach damage causing spleen dysfunction, and the small intestine cannot distinguish the secretion turbidity, diarrhea will occur. As described in "Jing Yue Quan Shu · Diarrhea": "If the spleen and stomach are injured due to improper diet and frequent living, the water will become wet, the grain will become stagnant, the qi of essence cannot be transferred, and even the combined pollution will decline, so diarrhea will occur." Liver depression and spleen deficiency an important pathogeneses of IBS-D [33]. According to the article in "Three Extremes and One Disease Syndrome Recipe · Diarrhea Narration", "Happiness will disperse, anger will stimulate, worry will gather, shock will move, the internal organs and qi will be cut off, and the spirit will break away, so that diarrhea will flow." This shows that diarrhea can be caused by abnormal emotions. The liver belongs to wood, and the spleen belongs to earth. If there is mental tension, anxiety, depression, or anger, it can cause liver qi stagnation, wood stagnation, and transverse invasion of the spleen. Or worry about damaging the spleen, soil deficiency, and wood deficiency can cause the spleen to lose its healthy function, leading to the loss of intestinal circulation and diarrhea. Long term illness leads to physical deficiency, prolonged illness affects the kidneys, spleen disease affects the kidneys over time, kidney yang deficiency leads to spleen loss of warmth, inability to digest water and grains, transport water and dampness, and inability to distinguish between clear and turbid, resulting in loss of conduction in the large intestine and long-term diarrhea. Therefore, spleen kidney yang deficiency is a key factor in the prolonged and difficult-to-cure IBS-D. Zhou Yanni, et al. [34] believe that the development process of IBS-D is a nauseating cycle, namely: visceral hypersensitivity - persistent and difficult to cure intestinal symptoms (spleen deficiency) - increased psychological burden (liver depression) - increased intestinal symptoms (liver spleen interaction) - mental stress leading to further aggravation of intestinal symptoms.

The background of "Yin Yang Regulation Moxibustion" is the theory of Yin Yang, which is a new type of traditional

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Chinese medicine moxibustion technique that uses ginger separated moxibustion in different parts of the body based on the patient's constitution bias and dialectical differences. Through this treatment, it can achieve the therapeutic effects of warming Yang and promoting pulse circulation, nourishing Yuan and consolidating the foundation, and harmonizing Yin and Yang. This research plan adopts the method of tonifying the spleen and regulating qi in yin-yang regulation moxibustion, which involves applying ginger-covered moxa moxibustion within the range formed by the combination of the Qi Hai Shu points on both sides to the Ge Shu point and the Wei Cang points on both sides to the Soul Gate point. The coverage includes the Ge Shu Gan Shu, Dan Shu, Pi Shu, Wei Shu, Sanjiao Shu, Shen Shu, Qi Hai Shu, Soul Gate, Yang Gang, Yi She, and Wei Cang points on the Foot Sun Bladder Meridian, as well as the Ming Men, Xuan Shu, Ji Zhong, Zhong Zhong, Jin Shou, Zhi Yang and other acupoints on the Du Meridian. The Five Organs Back Shu acupoint on the Bladder Meridian can regulate the qi and function of corresponding organs, while the Xuan Shu, Ji Zhong, Zhong Shu, Zhi Yang, and other acupoints on the Du meridian have the function of soothing the liver, strengthening the spleen, and stopping diarrhea. Ginger separated moxibustion combines the warmth of ginger with the heat of moxibustion fire, and has the function of strengthening the spleen and promoting the circulation of middle yang through warming. Modern research has shown [35,36] that gingerol in ginger has effects on strengthening the spleen and stomach, protecting the liver and promoting bile flow, and reducing inflammation. Ginger moxibustion can regulate the levels of neuropeptides and inflammatory cytokines in the colon tissue of rats with ulcerative colitis, thereby achieving the goal of treating ulcerative colitis. There is experimental evidence [37] that the thermal stimulation, light radiation, and moxa smoke generated during moxibustion can significantly increase the pain threshold of IBS-D rats, regulate the fecal characteristics of model rats, and improve colonic fluid metabolism. Among them, thermal stimulation and light radiation may play a more important role. Therefore, the tonifying spleen and regulating qi moxibustion in yin-yang regulation moxibustion has the effects of soothing the liver, strengthening the spleen, regulating qi, and stopping diarrhea.

Conclusion

In summary, the combination of yin yang regulation moxibustion and oral administration of Trimebutine Maleate Capsules can significantly reduce the IBS-SSS score of IBS-D patients, alleviate their abdominal pain and bloating symptoms, improve their bowel satisfaction, and alleviate the impact of intestinal symptoms on their quality of life. Its mechanism of action may be related to the fact that yin yang regulation moxibustion can regulate the levels of brain gut peptides in IBS-D patients, improve intestinal microbiota, and restore the normal regulation of the brain gut microbiota axis in patients.

Limitations and prospects

As a new treatment mode for IBS-D, Yin-Yang regulation moxibustion currently lacks large sample data support. The research team will expand the sample size, refine the microbial community detection, and extend the follow-up period in future studies to conduct long-term efficacy evaluation.

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