

Research Progress of Traditional Chinese Medicine in Radiation Enteritis

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Abstract: Radiation enteritis (RE) is an intestinal complication caused by radiotherapy for abdominal and pelvic or retroperitoneal malignant tumors. At present, Western medicine believes that RE is caused by radiation damage to the gastrointestinal mucosa and the imbalance of intestinal flora. Treatment includes nutritional support, drug therapy, endoscopic therapy, surgery, and stem cell transplantation, but the efficacy is not good, and the side effects are large, the safety is low; while traditional Chinese medicine has a significant effect on the treatment of this disease. The study found that damage to the spleen and stomach and accumulation of heat toxin are the fundamental pathogenesis of RE. In this paper, the treatment of RE with traditional Chinese medicine is reviewed from the aspects of traditional Chinese medicine internal treatment (single herbs, classical prescriptions, and experimental prescriptions), traditional Chinese medicine, external treatment (traditional Chinese medicine retention enema, cupping, acupuncture), etc. to provide a reference for follow-up clinical and scientific research work.

Radiation enteritis (RE) refers specifically to intestinal-related diseases caused by radiotherapy for malignant tumors in the abdominal and pelvic cavity or retroperitoneum. Ulceration and perforation [1]. Most of the disease sites are in the small intestine and colorectum, which can cause serious damage to the intestinal mucosa, resulting in obvious adverse effects on the digestive tract. According to literature statistics [2], about 5% to 17% of radiotherapy patients can eventually develop RE, and the mortality rate is 15% to 25%.

Modern medicine believes that the cause of RE [3] is mainly due to radiation damage to the gastrointestinal mucosa, resulting in an imbalance of intestinal flora. Treatment often includes nutritional support, drug therapy, endoscopic therapy, surgical treatment, and stem cell transplantation, but western medicine is prone to adverse reactions and postoperative complications [4]. On the basis of the overall concept, syndrome differentiation and treatment, and the combination of disease and syndrome, TCM has unique insights into the etiology and treatment of RE. The research progress of traditional Chinese medicine treatment of RE is summarized as follows.

1. Etiology and Pathogenesis

There is no record of this disease in the motherland medicine, but according to its clinical symptoms, it can be classified into "abdominal pain", "diarrhea", "dysentery", "blood in the stool", "intestinal addiction" and other categories. For example, "The Yellow Emperor's Classic of Internal Medicine" records that "the heat remains in the small intestine, causing pain in the intestine", and "injection is forced, all belong to heat." It can be seen that heat pathogens can cause abdominal pain and diarrhea, which is related to the pathogenesis of ray heat poisoning in RE. Coincidentally; Chen Wuzhe's "Three Causes, Extremes and One Disease Syndrome Recipe: Diarrhea Narrative" proposes that "zang qi is isolated, the spirit is deprived and scattered, resulting in loose venting", so it can be seen that this disease is responsible for the deficiency of zang qi.

Regarding the etiology and pathogenesis of RE, modern physicians have their own opinions. Professor Park Bingkui [5] believed that the disease was caused by the internal invasion of cancer toxins, the weakness of qi and blood, and the injury of heat toxins. Professor Shi Hengjun[6] believed that the disease always belongs to the deficiency of the essence, the deficiency of cold and heat, and the deficiency of the spleen and stomach. Professor Fang Mingzhi[7] also believed that the key to the pathogenesis of RE was "fire and blood stasis". Professor Li Peiwen[8] believes that the disease is based on the deficiency of the spleen and stomach, and the fire toxin damages the intestinal collaterals. Prof. Huo Jiege[9] also believed that RE is a disease of deficiency, deficiency and excess, and deficiency and excess. It can be seen from the above that RE is a disease of deficiency of spleen and stomach and heat toxin accumulation.

2. Internal Medicine of Traditional Chinese Medicine

2.1 Single Traditional Chinese Medicine

Rhubarb has the functions of purging and attacking accumulation, clearing heat, and purging fire, and emodin is its main extract, which has pharmacological effects such as anti-inflammatory, anti-tumor, and protection of gastrointestinal mucosa [10]. Wang Yu et al. [11] modeled RE rats to explore the efficacy of emodin in the treatment of RE and its mechanism of protecting the intestinal mucosa. The results found that the mechanism of emodin's effect is to reduce the intestinal tissue tumor necrosis factor α (tumor necrosis factor α) of RE rats. necrosis factor, TNF- α) expression, promotion of nitric oxide (nitric oxide, NO) production and enhancement of intestinal tissue diamine oxidase (Diamine oxidase, DAO) activity to achieve[12].

Evodia has the effects of warming yang and relieving diarrhea, lowering the inverse and relieving vomiting, dispelling cold, and relieving pain. Toll-like receptors-4 (toll-like receptors-4, TLR4)/nuclear factor kappa-B (NF- κ B) signaling pathway [13] can lead to intestinal mucosal barrier damage and promote the occurrence of RE. NF- κ B p65 protein and TNF- α are important links in the TLR4/NF- κ B signaling pathway. The histological changes of RE are due to a decrease in the number of glandular cell divisions and the length of intestinal villi, accompanied by infiltration of inflammatory cells in the intestinal mucosa, resulting in atrophy of the mucosa, submucosa, and even full thickness intestinal wall. Studies have found that [14-15] evodiamine can increase the depth of crypts, the thickness of mucosa and full-thickness wall in the intestinal tissue of RE mice, increase the content of DAO, and reduce the protein expression of NF- κ B p65, the content of TNF- α and the mRNA of IL-6 related genes. At the same time, the effect of evodiamine is closely related to the administration time, and the effect of preventive medication (that is, medication before radiotherapy) is stronger than that of simple administration.

Nutmeg has the effect of warming the middle and promoting qi, astringent intestines and antidiarrheal, and volatile oil is its main component, which has anti-inflammatory, analgesic,

antidiarrheal, and antibacterial effects [16]. Cao Yang et al. [17] found that nutmeg volatile oil can effectively relieve the symptoms of RE mice, by inhibiting the NF- κ B signaling pathway and downregulating the expression of IL-8, thereby reducing the release of inflammatory factors and reducing the damage to the intestinal mucosa caused by radiotherapy.

2.2 Traditional Recipes

Gegen Qinlian Decoction comes from "Treatise on Febrile Diseases", which has the effect of clearing away heat, raising yang, and relieving dysentery. Wang Liying et al. [18] observed the clinical efficacy of modified Gegen Qinlian Decoction in the treatment of 35 patients with acute RE, and found that the total effective rate was 94.29%, and the levels of WBC, PLT, IgG, IgM, and IgA in the patients were higher than those in the control group (montmorillonite). It can be seen that the modified Gegen Qinlian Decoction can enhance the immunity of RE patients and improve the clinical symptoms and blood indicators.

Shaoyao Decoction originated from "Su Wen Pathogenesis Qi Yi Bao Ming Ji", which has the effects of clearing away heat and dampness, reconciling qi and blood, and is often used to treat damp-heat dysentery. Zou Changpeng et al. [19] performed enema with modified Shaoyao decoction combined with western medicine (montmorillonite powder + dexamethasone + 2% lidocaine hydrochloride solution) in 40 patients with RE, and found that serum IL-6, TNF- α , CRP, etc. The level was significantly lower than that of the control group, indicating that the prescription can significantly improve the symptoms of RE patients.

Shenling Baizhu San comes from the "Taiping Huimin Ji Ju Prescription", which can strengthen the spleen and replenish qi, remove blood stasis, and detoxify, infiltrate dampness and stop diarrhea, and treat diarrhea caused by spleen deficiency and dampness. Ge Ming et al. [20] treated 30 patients with RE with Shenling Baizhu Powder for two weeks, and found that the abdominal pain and diarrhea in RE patients were relieved compared with before, and the cure rate was 86.67% by colonoscopy, and there were no obvious adverse reactions, indicating that the patients with RE were cured. Lingbaizhu powder is effective in treating RE.

2.3 Experience Prescription

He Xinxing[21] used "Anchang Fang" (Shengyu, Pulsatilla, Coptidis, Atractylodes, Poria, Agrimony, Muxiang, Licorice, etc.) to treat RE patients. The results showed that this formula can effectively repair intestinal mucosal damage and strengthen intestinal tolerance to radiation, the clinical efficacy is significant. Professor Park Bingkui[5] advocated the combination of disease differentiation and syndrome differentiation in the treatment of RE. According to his clinical experience, Pu Bingkui believed that RE was nothing more than four types of syndromes: heat-toxin internal injury, spleen deficiency and dysfunction, spleen kidney deficiency, and spleen depression. Detoxification (the most widely used), invigorating the spleen and removing dampness, warming the kidney and warming the spleen, etc. are the treatment methods, and the "enteritis prescription" (raw astragalus, Taibai ginseng, fried Atractylodes, dried tangerine peel, fried malt, fried hawthorn, fried Divine Comedy, etc.) is used to treat RE. The patient had the effects of clearing away heat, detoxifying and stopping diarrhea, and strengthening the spleen and dampness and benefiting the kidney. Jiang Weidong et al. [22] treated 30 cases of RE patients with Hongyu drink (Hongteng, Paijiangcao, Pulsatilla, Cornus, Astragalus, Taizishen), which was formulated by Professor Lu Jingen, and the curative effect was exact, with a total effective rate as high as 93.33%. Professor Jia Yingjie[23] believed that the deficiency of righteous qi and the internal invasion of fire toxin led to the occurrence of this disease, and based on the self-made Xiaoyan recipes (raw astragalus, Radix Radix, turmeric, turmeric, raw oysters, Prunella vulgaris, white-flowered snakes)

Tongue grass, dew apiary) syndrome differentiation to treat the disease, to achieve the effect of invigorating Qi, strengthening the body, detoxification and anti-cancer, and the clinical effect is very good.

3. External Treatment of Traditional Chinese Medicine

External therapy of traditional Chinese medicine is an accurate treatment for RE and has the advantages of less toxic and side effects, simple and inexpensive test, and so on. Commonly used methods include traditional Chinese medicine retention, enema, cupping, acupuncture, and so on. Clinically, it is often treated with a single treatment method or a combination of several methods.

Lian Yajun [24] found through a systematic review that traditional Chinese medicine enema liquids for RE treatment mainly include Kangfuxin Liquid, Compound Xuejie Enema Liquid, and Compound Qinbo Granules. Kangfuxin Liquid is the extract of American cockroach, which can clear blood vessels, nourish yin, and strengthen muscles. Meta[25] analysis shows that Kangfuxin liquid enema can inhibit the inflammatory response and reduce the level of serum inflammatory indicators, thereby repairing the intestinal mucosa, effectively treating RE, and improving the quality of life of patients. Wang Quanxin et al. [26] used a bloodletting cupping method combined with Baitouweng decoction and oral administration combined with enema to treat 60 patients with acute RE. Among them, 30 cases were treated with traditional Chinese medicine enema combined with bloodletting cupping, and the other 30 cases were treated with oral traditional Chinese medicine on this basis to evaluate the curative effect. , the results show that the above two methods can improve the clinical syndrome scores of patients, as well as HB, WBC, PLT, Karnofsky functional status score (KPS) reaction. Zang Liubin [27] performed warm acupuncture and moxibustion on 60 patients with RE. The acupoints were Zhongwan, Tianshu, Shangjuxu, Zusanli, etc., the needles were retained for 30 minutes, and moxibustion was performed for 2 Zhuang. The results showed that warm acupuncture and moxibustion in the treatment of RE can significantly improve symptoms such as abdominal pain and diarrhea, and the clinical effect is significant.

4. Summary

Radiotherapy is one of the main treatment methods for advanced pelvic, abdominal, and retroperitoneal tumors, but it is easy to cause RE, which limits the wide application of radiotherapy. Western medicine treatment of RE is ineffective, with large side effects and low safety. Under the guidance of the overall concept and the principle of syndrome differentiation and treatment, traditional Chinese medicine has achieved good curative effects in the prevention and treatment of RE, effectively improving the symptoms of patients and improving the quality of life. However, there are also shortcomings in the prevention and treatment of RE with traditional Chinese medicine, such as the small sample size of the study and the lack of relevant prospective studies, and the evaluation standards of traditional Chinese medicine efficacy are not standardized; another example is the lack of follow-up observation and the lack of long-term efficacy of the study. Therefore, in the future research on RE, the sample size should be increased, and more scientific efficacy evaluation standards should be formulated; at the same time, a follow-up system should be established to provide guidance for long-term efficacy.

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