

Progress of research on the treatment of constipation from dietary intervention

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Abstract: Nowadays, with the change in living conditions and the adjustment of dietary structure, together with the influence of psycho-spiritual and social factors, the incidence of constipation has (year by year) increased [1], which has seriously affected people's quality of life. There are various Chinese and Western medical diagnostic and treatment methods for constipation of different etiologies, and research on the prevention and treatment of constipation by dietary interventions has become a hot topic not infrequently. Therefore, this paper integrates and summarizes the relevant literature in recent years through the theoretical studies on the role of dietary intervention in constipation and its specific clinical applications, and briefly describes some theoretical and practical experiences and guidance on dietary intervention in constipation, providing new ideas and reference bases for the modern application of dietary intervention in the diagnosis and treatment of constipation.

Keywords: constipation, dietary structure, dietary intervention, dietary fiber, clinical applications

1. Introduction

Constipation is a common clinical symptom rather than a disease, and mainly refers to reduced frequency of bowel movements, decreased stool volume, dry stools, and straining to defecate. The definition of constipation varies widely [2], and the current academic definition of constipation mainly uses the Rome III criteria [3]. The clinical classification of constipation [4] is complex, and the main etiology is divided into organic constipation and functional constipation. Functional constipation is subdivided into slow-transmission colonic constipation and outlet obstruction constipation. In addition, there are also divided into colon constipation and rectal constipation according to the location, both of which are called mixed constipation, and there are acute constipation and chronic constipation according to the disease urgency. According to age, there are called senile constipation, according to the change in bowel habits called habitual constipation. In short, there are many constipation classifications, but the clinical constipation mostly refers to functional constipation, and the current methods of treatment of functional constipation [5] mainly include dietary intervention, pharmacotherapy, intestinal microecological therapy, biofeedback therapy and surgical treatment, and in recent years there are also new drugs elobixibat, vibration capsules and other new treatment means, but for chronic constipation, the long-term application of Western medicine drug therapy more on However, for chronic constipation, the long-term application of Western medicine drug therapy has different degrees of damage to the intestinal tract, while the new treatment means are still in the embryonic stage, there are many problems such as small trial sample size and insufficient experience in clinical application [4], and need a long-term development process to become more mature. Therefore, the traditional "food therapy" of TCM has the unique advantage of "safety and simple effectiveness" in the treatment of constipation.

The diagnosis and treatment of constipation in TCM has a long history, but of course, it is also advancing with the times and is constantly updated, from the dialectical treatment of Yin, Yang, deficiency, reality, cold, and heat constipation founded by Zhongjing [6] to the modern treatment of constipation from the liver [7], spleen [8], and lung [9], all of which are major breakthroughs in the treatment of constipation in TCM and have achieved good results in clinical practice. As for food therapy, as early as the Tang Dynasty, the book "Huangdi neijing taisu" said: "Eat as food on an empty stomach, and eat as medicine for patients", which shows that the theory of "medicine and food are of the same origin" has a long history, which refers to medicine as food, and at the same time, food The theory of "medicine and food as medicine" has a long history, which refers to medicine as food, and

food as medicine, killing two birds with one stone, using food as medicine, which has nutritional value and can regulate the body, cure and prevent diseases. Modern medical practitioners have used this as a theoretical basis to explore the role of dietary intervention in the diagnosis and treatment of diseases. In view of the close relationship between diet and constipation, this paper collates the relevant literature on the progress of dietary intervention in the diagnosis and treatment of constipation in recent years, and explores the theoretical basis of the intervention process and its clinical application, hoping to further explore the important role of diet in the diagnosis and treatment of constipation and provide new ideas and methods for the clinical diagnosis and treatment of constipation.

2. Theoretical basis of dietary interventions for constipation

2.1 Interventional adjustment of dietary structure

Diet is the indispensable material basis for maintaining human life activities^[10], and is the source of biochemistry of the body's qi and blood. A reasonable diet can nourish health and, under certain conditions, cure diseases. As early as in the *Nei Jing*, it is suggested that an uncontrolled diet that damages the qi of the spleen and stomach can lead to constipation^[11]. It can be seen that poor diet is an important cause of constipation. Modern medicine has also studied the close relationship between diet and constipation from the aspect of dietary structure. A variety of studies have confirmed that unreasonable dietary structure is an important factor leading to constipation^[7], excessive consumption of high-calorie, high-fat, high-salt foods, or irregular diet, too little water, too little food such as coarse grains, fresh vegetables and fruits can lead to constipation. The study by Yanqi Liu^[12] showed that picky eating, partial eating, and improper diet structure are also causes of functional constipation, such as partial eating of foods with high protein content, which can easily lead to alkaline and dry stools and cause functional constipation. It can be seen that the diet structure is an important cause of constipation, so the intervention of diet structure can effectively improve various types of functional constipation.

2.1.1 Dietary fiber promotes bowel movement and regulates bacterial flora

In the adjustment of dietary structure, the incorporation of dietary fiber is one of the most important aspects. With the improvement of living conditions, in order to pursue a high quality of life, people have gone into a life misunderstanding, and their diets have become more and more refined, however, not all diets are better the more refined they are, and Wang Zhenjun et al^[13] found through their study that compared to traditional dietary patterns, diets that are too refined, with too much fat and high protein food intake and too little dietary fiber intake are often an important cause of constipation. Studies have shown that a high-fiber diet increases stool weight and leads to reduced colonic transit time, while a low-fiber diet leads to constipation. In addition, increasing dietary fiber improves symptoms in patients with normal colonic transit and anorectal function^[14]. Dietary fiber in the diet is divided into water-soluble dietary fiber and non-water-soluble dietary fiber, which mainly originates from fruits, vegetables, peas, etc. Its main characteristic is that it contains a large amount of water, can be decomposed by bacteria in the large intestine, increases the viscosity of food in the stomach, is fermented and absorbed by the intestine, and improves nutrition for the organism. Non-soluble dietary fiber mainly originates from the peels and seeds of fruits and vegetables, which are not easily decomposed, are absorbent, increase the weight of feces, and help to produce stool and defecation^[15]. By observing the effects of dietary interventions on patients with constipation, Zhang Lin et al^[1] found that a certain amount of coarse grains, yogurt, and fresh vegetables in food could improve or relieve constipation by increasing the number of bowel movements, reducing the degree of difficulty in defecation, and improving stool properties. Therefore, in the usual diet structure, patients with constipation should increase the intake of high-fiber diet to help defecation and improve the symptoms of constipation. The lack of dietary fiber intake not only causes constipation, but also may have the potential to cause disease due to intestinal flora imbalance. Some scholars have found that dietary fiber under certain dosage conditions can not only promote defecation but also regulate the balance of intestinal flora. Bai Bingyao et al^[16] found that dietary fiber from red dates could significantly improve functional constipation and regulate intestinal flora balance in mice, resulting in a significant increase in the number of bifidobacteria and lactobacilli and a significant decrease in the number of enterococci, enterobacteria and *Clostridium perfringens* in the intestinal tract. Studies have shown that dietary fiber-rich foods such as soy products, dates, cereals and bananas have been shown to promote the value-added of bifidobacteria and lactobacilli and reduce the abundance of harmful bacteria such as *Enterobacter* and *Clostridium perfringens*^[17]. In summary, it is concluded that fiber in food not only increases the water content of feces increasing the volume of feces and speeding up intestinal

transmission leading to more frequent bowel movements, but also promotes the reproduction of beneficial intestinal bacteria and regulates the balance of intestinal flora.

2.1.2 Medicinal and food use

The prevention and treatment of constipation in Chinese medicine is not limited to diet alone, but can be used in medicine and food together, on the basis of the dialectical use of drugs to impose dietary therapy, often with half the effort. Some scholars have explored the dietary therapy for constipation to develop different dietary treatment plans according to the TCM dialectical typology. Wang Zhaoyun^[18] divided patients with constipation into the following types of treatment: 1 Qi deficiency constipation constipation, but the fecal matter is not dry and hard, although there is a bowel movement, but the toilet cannot struggle, the face is light white, lazy speech, white tongue light fat, weak pulse. It is advisable to nourish the qi and moisten the bowels. It is advisable to eat ginseng, astragalus, codonopsis, yam, corn, shamrock, japonica rice, glutinous rice, pork, beef, red dates, honey and other food and medicinal food, avoid spicy food. 2 Blood deficiency constipation Symptoms include dry stools, dull complexion, dizziness, palpitations and forgetfulness, restlessness at night, pale tongue and small pulse. It is advisable to nourish the blood and moisten the bowels. The diet should be black sesame, angelica, shouwu, mulberry seeds, honey, fruit juice, beans, lean meat and other foods that nourish the blood and moisten the bowels, as well as medicinal and food products. Avoid spicy and fire food. 3 Yin deficiency and fluid deficiency constipation The symptoms are dry stool, dry lips and tongue, thirsty and drink, dizziness and dry throat, red tongue, less fluid, thin pulse. It is advisable to nourish yin and promote the production of fluid, moisten the intestines and open the bowels. Food therapy should be appropriate to increase coarse grains, vegetables, fruits and other foods containing more coarse cellulose. Eat more sesame seeds, honey, sesame oil, bananas, snow pears, sunflower seeds, pine nuts, cypress seeds, raw radix, xuan ginseng, raw earth, whole guavas, fire hemp seeds and other foods that nourish yin and moisten the intestines and medicinal food. 4 Yang deficiency cold constipation Symptoms are dry and difficult to relieve stools, the limbs are not warm, fear of cold and like warmth, the face is blue and white, the waist and knees are sore and soft or cold pain in the abdomen, the tongue is light with white fur, the pulse is sunken and sluggish. It is advisable to warm the Yang and open the stool. Diet therapy is recommended to eat walnuts, wheat bran, buckwheat, cistanches, mutton, kidney, dog meat, leek, milk and other warm yang foods, and avoid eating strong tea. According to the classification of patients with constipation, the combination of Chinese medicine and food, not only to make up for the weakness of food alone, but also to avoid the strong force of medicine alone, can be taken for a long time, in clinical practice for patients with chronic constipation is a "good prescription".

2.2 From the theory of health to combat constipation

Traditional Chinese health care is deeply rooted in people's hearts and is commonly used in modern times. It helps the human body to restore the righteousness and fight against the evil by following the dialectical methods of the heavenly times and physical constitution, thus improving people's physical quality. A proper diet plays a great role in TCM health care. As Wu Zhenglun said, "nourishing people first with five flavors and grains, followed by five medicines and diet, so nourish life, not knowing that diet disorders can also harm life"^[19]. Therefore, in order to maintain health, first adjust the diet, and then medicine when the diet cannot maintain the normal functional state of the body. In a study by Ye Xinmei et al^[18], the combination of TCM nourishment methods and dietary care applied to postoperative gastrointestinal patients could help improve the body's positive energy, thus promoting the patient's physical recovery. Regulating the diet, harmonizing the five tastes, and matching them rationally are the important ways to maintain health with the five tastes of the diet, and avoiding "too much" and "bias". For patients with constipation, the five tastes of the diet can be chosen to help digestion, good for relieving constipation food. Therefore, patients with constipation are recommended to eat fruits, vegetables, coarse grains and other foods that can be easily digested by the gastrointestinal tract, but the clinical situation should also be considered in the context of the actual situation of patients, such as the elderly constipation because of their gastrointestinal power is insufficient, intestinal peristalsis is weakened, too much consumption of vegetables and fruits but add to the gastrointestinal burden^[20]. Therefore, there is a great deal to learn about the dietary regimen for constipated patients, which must be scientifically reasonable and correctly selected. For example, among the foods that are popularly recognized as beneficial to relieve constipation, honey can indeed moisten and laxative, but it must be chosen with respect to personal constitution and the hot and cold nature of honey. For example, if you have a hot body that is prone to fire, you should choose a honey that is cool in taste, such as acacia honey and loquat honey. If you have a weak spleen or stomach, or if you have diarrhea from eating cold food, you should choose a honey that is warm in nature, such as date palm honey. The

banana is rich in dietary fiber, can play the role of laxative, but in fact can really relieve constipation is ripe bananas, and raw bananas contain a large amount of tannic acid, with astringent effect, but eaten to aggravate constipation. In addition to the time to choose food, modern health also has a lot of attention, not too late to eat, otherwise not only affect the digestion, but also affect the quality of sleep, and sleep quality can directly affect the normal gastrointestinal function, resulting in constipation. Wu Zhenglun believes that "the spleen is good sound, hear the sound that is moving and grinding food", and Taoism also has "the spleen hear music is grinding" [21], it can be seen that music helps digestion, listening to music during and after meals is very beneficial to the health of constipation patients. Constipation is mostly caused by inappropriate diet, which affects the normal digestive function of the stomach and intestines, so the self-healing of constipated patients relies heavily on dietary regimen. Grasp the rules of constipation patients' health, take scientific and effective intervention on their diet, can achieve better repair results.

3. Clinical application

3.1 Application of prevention and treatment to hospitalized patients

In clinical practice, there are many types of patients with constipation. In addition to patients who come to the hospital with constipation as the main symptom, there are also most inpatients who have constipation as a complication or as a toxic side effect. Patients may suffer from constipation to varying degrees due to prolonged bed rest, lack of exercise, slowed bowel movement, drug effects, or emotional and psychological factors. In clinical practice, in order to reduce the intake of oral medications and to avoid the possible side effects of oral laxatives, this constipation as a complication or side effect can often be better treated by dietary interventions, which are easily accepted and recognized by patients. It was found that the duration of postoperative feeding was a risk factor for constipation in surgical patients, and the risk of constipation increased 6.377 times for each 1-d increase in the duration of postoperative feeding [12]. Yang Huiling et al [22] found that dietary guidance was effective in reducing the occurrence of constipation in postoperative patients through a study. Peng Jun [23] found that increased dietary intake of kelp, beans, bananas, and dragon fruit improved constipation in pregnant women by logistic regression analysis of dietary factors to alleviate constipation in pregnant women. Therefore, effective dietary interventions for patients can provide some degree of prevention and treatment of constipation. In addition, constipation is often seen as a toxic side effect in chemotherapy patients. Once constipation occurs, the chemotherapy drugs will accumulate in the patient's body and aggravate the patient's toxic reaction. If just simply applying the open plug is easy to rub the skin to cause bleeding, infection and other risks, so for the constipation of chemotherapy patients, the main clinical use of dietary intervention, by adjusting the patient's diet structure to prevent constipation. It is a very effective method to prevent constipation. Meng Xia [24] analyzed that the earlier the dietary guidance was given to breast cancer chemotherapy patients to enhance their dietary guidance comprehensively, the better the effect of constipation prevention. This indicates that dietary intervention needs to be early because good dietary and bowel habits need a long-term process, and only the earlier the intervention is made, the more effective the prevention of constipation will be.

3.2 Ancillary treatment applications

Dietary interventions are not only useful in the prevention and treatment of constipation, but also in the preparation of functional constipation patients for colonoscopy as an adjunct to treatment. In the process of colonoscopy preparation, due to the specificity of the patient's stool, functional constipation patients who simply apply bowel cleansers are not ideal, and often need to combine a variety of auxiliary measures, of which dietary interventions are inexpensive, operable, and widely used in clinical practice. In functional patients with dry and hard stools, the effect of applying laxative drugs alone is not ideal, so low-fiber dietary interventions are mostly used to promote intestinal cleansing before examination. Zhang Yuanyuan et al [25] showed that the factors that affect the factors related to bowel microscopy before examination are age, history of chronic constipation, history of appendectomy, walking events during medication, amount of bowel cleansing medication taken, medication-defecation time interval, number of bowel movements, last defecation properties, and diet. Among them, dietary factors are the most adjustable and actionable for microscopy preparation and can be intervened as early as possible. Liu Haiyin et al [26] used different lengths of low-fiber diet to intervene in the pre-microscopic preparation of constipated patients based on the application of laxative medications, and found that an extended low-fiber diet could better improve bowel cleansing and

expand the range of bowel cleansing. Therefore, it can be concluded that for patients with functional constipation, the effective duration of low-fiber diet before colonoscopy can improve the quality of intestinal microscopy and maximize the role of adjunctive treatment, which is worth promoting.

4. Summary

At present, there are many Chinese and Western medical treatments for constipation, but they all have limitations and shortcomings. Based on its scientific and evidence-based theoretical basis and clinical application efficacy, dietary intervention has been proven by many scholars to be effective in relieving and preventing constipation, and is widely recognized and accepted by patients, and it can not only be used as a primary means to prevent and treat constipation, but also as an auxiliary means to improve the quality of intestinal microscopy in patients with constipation, providing new ideas for clinical diagnosis and treatment of patients with constipation. It provides a new way of thinking for the clinical management of constipation patients. The method is safe, economical and effective, and is worthy of application and promotion in clinical patients. However, there are many types of patients with clinical constipation, and although this paper has introduced several dietary intervention programs for patients with constipation, it is still far from enough, and a large number of scientific and standardized clinical trials are needed to elaborate and verify the specific application and effect of dietary intervention for patients with clinical constipation.

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