

Evaluation of the Application Effect of Enteral and Parenteral Nutrition Therapy Combined with a Health Belief Education Model in Patients with Inflammatory Bowel Disease

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Abstract: *Objective:* To evaluate the application effect of enteral and parenteral nutrition therapy combined with a health belief education model in patients with inflammatory bowel disease. *Methods:* 80 patients with inflammatory bowel disease admitted to the Shanghai Zhangjiang Institute of Medical Innovation were chosen. This study was carried out from August 2022 to October 2023. The patients were randomly divided into a study group (40 cases) and a control group (40 cases). The treatment plan for the control group was the conventional treatment model, while the treatment plan for the study group was to provide enteral and parenteral nutrition therapy combined with a health belief education model based on the control group. The efficacy of both groups was compared. *Results:* In the study group, the therapeutic effect for 31 patients (77.50%) was markedly effective and 7 was effective (17.50%), accounting for 95.0% of the total, which was higher than the control group at 80.0% ($P < 0.05$). The relief time of relevant symptoms in the study group was shorter than that of the control group ($P < 0.05$). Before treatment, there were no differences in the high-sensitivity C-reactive protein (hs-CRP), interleukin 10 (IL-10), and tumor necrosis factor- α (TNF- α) between both groups ($P > 0.05$). After treatment, the levels of inflammatory factors in the study group (hs-CRP (8.02 ± 1.13) mg/L, IL -10 (9.24 ± 1.25) pg/mL, and TNF- α (7.19 ± 1.04) ng/L) were lower than those in the control group ($P < 0.05$). *Conclusion:* Enteral and parenteral nutritional therapy combined with a health belief education model showed significant efficacy in inflammatory bowel disease patients. Patient symptoms were relieved and inflammatory reactions were reduced. This method is worthy of popularization.

Keywords: Enteral and parenteral nutrition; Health belief education; Inflammatory bowel disease

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1. Introduction

The most common nutritional status of patients with inflammatory bowel disease (IBD) is malnutrition. As the patient's ability to absorb nutrients is disrupted, malnutrition will occur over time, which may lead to weight loss and even cachexia^[1]. IBDs include Crohn's disease and ulcerative colitis. Nutritional intake is closely

related to the onset, symptoms, and recurrence of IBD. Compared with drug treatment, nutritional therapy can be self-adjusted according to the patient's condition. Nutritional guidance and management are key components in the treatment and management of IBD patients. Most patients will respond to symptoms by changing their nutritional intake^[2,3]. At the same time, patients may feel helpless and lose confidence in treatment. Hence, the application of a health belief education model can promptly grasp the inner thoughts of patients to help them face the disease with a positive and calm attitude, and increase their confidence in recovery^[4]. This study analyzed 80 patients with IBD who were admitted to the Shanghai Zhangjiang Institute of Medical Innovation. The report is as follows.

2. Materials and methods

2.1. General information

This study analyzed 80 patients with IBD admitted to Shanghai Zhangjiang Institute of Medical Innovation. It was carried out from August 2022 to October 2023. The patients were randomly divided into study and control groups, with 40 cases each. The control group consisted of 22 males and 18 females, with the average age and average disease duration being 37.02 ± 2.58 years and 5.18 ± 1.64 days, respectively. The study group consisted of 21 males and 19 females, with the average age and average disease duration being 36.93 ± 2.64 years and 5.21 ± 1.57 days, respectively. The basic information of the two groups of patients was comparable ($P > 0.05$). This study was carried out after obtaining approval from the ethics committee of Shanghai Zhangjiang Institute of Medical Innovation.

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) According to pathological analysis and colonoscopy, all subjects meet the relevant standards for IBD; (2) patients have relevant symptom characteristics when admitted to the hospital; (3) consented; (4) no contraindications to enteral or parenteral nutrition. Exclusion criteria: (1) Patients with a certain degree of mental disorder that prevents everyday communication; (2) severe gastrointestinal lesions or even tumors; (3) immune diseases.

2.3. Method

The treatment plan for the control group was a conventional treatment model. Patients were given symptomatic drug treatment, anti-inflammatory treatment, intestinal flora regulation treatment, etc., and appropriate nutritional intervention was given according to the patient's condition.

The treatment plan of the study group was enteral and parenteral nutrition therapy combined with a health belief education model based on the control group. During the enteral nutrition treatment, the nutrient solution was administered to the patient through a nasogastric feeding tube, and a personalized nutrition treatment was performed according to the patient's specific needs, including balanced nutrition, and input of normal nutrients. The temperature and the infusion rate were kept at moderate levels during administration. At the same time, osmotic pressure was kept at moderate levels as well. As for parenteral nutrition treatment, it was implemented 5 days before surgery for patients with severe malnutrition, and probiotic capsules were taken orally or via tube feeding for 2 months. The health belief education model was implemented to allow for timely communication and empathic management with patients so that patients could understand the characteristics of IMD and face the disease positively. Patients were actively encouraged and enlightened, where successful cases were introduced to the patients, and personalized nutritional plans were formulated to create a nutritionally harmonious and joyful atmosphere. At the same time, the patient was given sufficient rest to strengthen their

immunity.

2.4. Observation indicators

The therapeutic efficacy, and relief time of related symptoms after treatment, including changes in abdominal pain, diarrhea, bloody stools, etc. were compared between both groups. Patient serum was collected and the levels of inflammatory factors in the two groups of patients before and after treatment were detected, including ultrasonic sensitive C-reactive protein (hs-CRP), interleukin-10 (IL-10), and tumor necrosis factor- α (TNF- α).

2.5. Statistical processing

Excel 2010 and SPSS 26.0 were used to collect and analyze patient data. Measurement data were expressed as mean \pm standard deviation and compared using the *t*-test; count data were expressed as % and analyzed using the chi-squared (χ^2) test. $P < 0.05$ indicates that the difference is statistically significant.

3. Results

3.1. Comparison of the therapeutic efficacy between two groups of patients

As shown in **Table 1**, 31 cases (77.50%) of patients in the study group showed significant therapeutic efficacy, and 7 cases (17.50%) had an effective rate, accounting for 95.0% of the total, which was higher than 80.0% of the control group ($\chi^2 = 12.948$, $P = 0.000$).

Table 1. Comparison of therapeutic efficacy between two groups of patients [*n* (%)]

| Group | Case, <i>n</i> | Effective | Efficient | Invalid | Always efficient |
|----------|----------------|------------|-----------|----------|------------------|
| Study | 40 | 31 (77.50) | 7 (17.50) | 2 (5.0) | 38 (95.0) |
| Control | 40 | 22 (55.0) | 10 (25.0) | 8 (20.0) | 32 (80.0) |
| χ^2 | | | | | 12.948 |
| <i>P</i> | | | | | 0.000 |

3.2. Comparison of relief time of relevant symptoms between two groups of patients

As shown in **Table 2**, the relief time for abdominal pain, diarrhea, and bloody stools in the study group was shorter than that of the control group. ($P < 0.05$).

Table 2. Comparison of relief time of relevant symptoms between two groups of patients (mean \pm standard deviation, days)

| Group | Case, <i>n</i> | Abdominal pain relief time | Diarrhea relief time | Bloody stool relief time |
|----------|----------------|----------------------------|----------------------|--------------------------|
| Study | 40 | 1.69 \pm 0.32 | 2.27 \pm 0.15 | 2.45 \pm 0.53 |
| Control | 40 | 2.45 \pm 0.33 | 3.19 \pm 0.28 | 3.52 \pm 0.41 |
| <i>t</i> | | 6.338 | 7.892 | 7.035 |
| <i>P</i> | | 0.013 | 0.008 | 0.010 |

3.3. Comparison of inflammatory factor levels between two groups of patients before and after treatment

As shown in **Table 3**, the levels of inflammatory factors in both groups were reduced after treatment, and the levels of inflammatory factors in the study group were lower than that of the control group ($P < 0.05$).

Table 3. Comparison of inflammatory factor levels between two groups of patients before and after treatment (mean \pm standard deviation, $n = 40$)

| Group | hs-CRP (mg/L) | | IL-10 (pg/mL) | | TNF- α (ng/L) | |
|---------|------------------|------------------|------------------|------------------|----------------------|------------------|
| | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment |
| Study | 14.16 \pm 2.85 | 8.02 \pm 1.13 | 38.49 \pm 2.86 | 9.24 \pm 1.25 | 15.83 \pm 2.36 | 7.19 \pm 1.04 |
| Control | 14.32 \pm 2.74 | 11.87 \pm 2.43 | 37.05 \pm 3.25 | 18.69 \pm 3.07 | 15.27 \pm 2.29 | 10.26 \pm 1.15 |
| t | 1.058 | 8.944 | 0.996 | 9.713 | 1.562 | 8.247 |
| P | 0.325 | 0.002 | 0.438 | 0.000 | 0.307 | 0.004 |

4. Discussion

IBD damages the intestinal mucosa and reduces mucus secretion, allowing harmful bacteria to invade the intestinal wall, increasing stimulation of the intestinal immune system, and promoting repeated episodes of inflammation. It also affects the absorption and secretion of water and electrolytes, leading to symptoms such as diarrhea and frequent defecation, resulting in the body's loss of water and electrolytes, thus affecting the patient's nutritional intake. Therefore, good nutritional support is required to improve the patient's immunity [5,6]. Enteral nutrition is a nutritional support method that metabolizes nutrients through the gastrointestinal tract and is consistent with the physiological functions of the intestine. Enteral nutrition support can relieve symptoms in patients with IBD, improve nutritional status, promote growth and development, and improve disease prognosis [7]. Generally, enteral nutrition replaces ordinary nutritional intake, prevents intake of food that induces diseases, such as allergenic proteins, refined sugar, certain fats, pathogenic microorganisms, parasites, etc., and achieves the purpose of regulating the intestinal flora. Parenteral nutrition is the intravenous infusion of necessary nutrients into the patient's body, providing the patient with sufficient nutrition to cope with the disease [8,9]. Parenteral nutrition can reduce burden on the intestines while correcting the malnutrition status of patients with IBD. The principle of intestinal rest is to promote the recovery of the intestinal mucosa by limiting the exposure of the intestines to pro-inflammatory antigens and reducing the risks of surgical treatment. The health belief education model is aimed at the psychological and emotional changes that occur in patients with IBD after they become ill. It provides a response plan and uses health education and communication methods to help patients reduce their uneasiness and burden, maintain a positive attitude, be compliant with treatment, and overcome the disease with their own strong beliefs [10]. The health belief education model is based on the anxiety and uneasiness exhibited by patients during the treatment of IBD. It implements different psychological interventions and health education to relieve the patient's burden and allow good nurse-patient cooperation. This study adopted the appropriate treatment plans based on the patient's nutritional status and psychological changes during treatment to develop personalized nutritional and psychological intervention measures. After undergoing enteral and parenteral nutrition therapy combined with the health belief education model, the therapeutic effect of the study group was 95.0%, which was significantly higher than that of the control group at 80.0%; the relief time of relevant symptoms in the study group was shorter than that of the control group, and the abdominal pain, diarrhea and bloody stools of patients in the study group were relieved after treatment. This showed that through nutritional intervention and health belief education, patients can face the disease more positively and the symptoms can be alleviated at a faster rate.

The precise mechanism of the positive effect of enteral and parenteral nutrition in IBD is unclear. It is currently hypothesized that enteral nutrition can improve the patient's intestinal flora and repair the intestinal

mucosa, while parenteral nutrition induces vomiting. Symptoms such as abdominal pain, diarrhea, etc., were improved. At the same time, the damage and irritation of the inflammatory mucosa caused by food is reduced, and the repair and regeneration of intestinal diseased mucosa is promoted. This study compared the levels of inflammatory factors in patients before and after treatment and found that the levels of inflammatory factors in the study group (hs-CRP (8.02±1.13) mg/L, IL-10 (9.24±1.25) pg/mL and TNF- α (7.19± 1.04) ng/L) were lower than that of the control group, indicating that enteral and parental nutrition was able to reduce inflammatory symptoms in IBD patients.

5. Conclusion

Enteral and parenteral nutritional therapy combined with a health belief education model showed positive outcomes in the treatment of IBD patients. The patient's related symptoms and inflammatory reactions were reduced. Hence, this method should be popularized.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Li Z, Wang Y, 2021, Effects of Enteral Nutrition Preparations Added with Soluble Dietary Fiber on Intestinal Immune Balance and Intestinal Flora in Patients with Inflammatory Bowel Disease. *Heilongjiang Traditional Chinese Medicine*, 50(1): 106–108.
- [2] Zhang C, He M, Wang Q, et al., 2021, Effects of Infliximab Combined with Compound Probiotics on Intestinal Mucosal Barrier, Inflammatory Factors, Cellular Immune Function, and Bone Metabolism Indicators in Patients with Inflammatory Bowel Disease. *Progress in Modern Biomedicine*, 21(20): 3954–3958.
- [3] Cai J, Mo S, Zhou M, et al., 2023, The Relationship Between Nutritional Risk and Depression, Psychological Flexibility and Self-Management Behavior in Inpatients with Inflammatory Bowel Disease. *Chinese Journal of Health Psychology*, 2023, 31(4): 514–518.
- [4] Dan L, Fu T, Sun Y, et al., 2023, Associations of Sugar-Sweetened Beverages, Artificially Sweetened Beverages, and Natural Juices with Cardiovascular Disease and All-Cause Mortality in Individuals with Inflammatory Bowel Disease in a Cohort Prospective Study. *Therapeutic Advances in Gastroenterology*, 16(4): 305–312.
- [5] Song M, Liu Y, Wu J, et al., 2022, Research Progress on the Interaction Between Medicinal and Edible Plant Polysaccharides and Intestinal Flora and Improving Inflammatory Bowel Disease. *Chinese Modern Chinese Medicine*, 24(11): 2081–2092.
- [6] Yan W, Huang Y, Chen S, et al., 2023, Analysis of Influencing Factors of Nutritional Risk in Patients with Inflammatory Bowel Disease. *Qilu Nursing Journal*, 29(19): 39–42.
- [7] Wu S, Li H, 2023, Application of Nutrition Team Intervention Model Based on “H2H” Management in Patients with Inflammatory Bowel Disease. *Contemporary Nurses (Later Issue)*, 30(12): 19–24.
- [8] Song Y, Wu G, Chen Y, et al., 2023, Effect of Family-Centered Combined with Individualized Nutritional Intervention in Pediatric Inflammatory Bowel Disease. *Journal of Chronic Diseases*, 2023, 24(12): 1861–1863 + 1867.
- [9] An H, Wu Y, Sun J, et al., 2023, Effect of Intensive Psychological Intervention Combined with Health Belief Model Education on Patients with Inflammatory Bowel Disease. *Qilu Nursing Journal*, 29(24): 40–44.

- [10] Liu F, Leng M, Zhong Z, 2022, Application of Nursing Measures Based on Importance-Performance Analysis Method in Patients with Inflammatory Bowel Disease. *Qilu Nursing Journal*, 28(21): 91–94.

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