Effect of bifidobacterium triple viable powder adjuvant therapy on the inflammatory factors and T lymphocytes subsets in patients with ulcerative colitis

Xue-Jun Tang, Xiao-Yun Wang, Gao-Jue Wu
Department of Gastroenterology, Wuxi Second People’s Hospital, Wuxi 214000 China

ARTICLE INFO

Article history:  
Received 6 Jun 2017  
Accepted 16 Jun 2017  
Available online 28 Jun 2017

Objective: To investigate effect of bifidobacterium triple viable powder on inflammatory factors and T lymphocyte subsets in patients with ulcerative colitis. Method: 80 patients with ulcerative colitis were selected and divided into observation group and control group, 40 cases in each group. The control group was given dietary guide, mesalazine, vitamin C and other comprehensive treatment; The observation group was given bifidobacterium triple viable powder adjuvant therapy on the basis of conventional treatment. The level of IL-6, CRP, TNF-α and T lymphocyte subsets in the two groups was compared before treatment (T0), after treatment for 1 month (T1), after treatment for 3 months (T2). Results: (1) The levels of IL-6, CRP and TNF-α at T1 serum were lower than those in T0 in both groups, the levels of serum IL-6, CRP and TNF-α at T2 were lower than those of T0 and T1, these three levels in different time points were statistical significant difference; The levels of serum IL-6, CRP and TNF-α in observation group at T1 and T2 were significantly lower than those in control group, there was significant difference in both groups; (2) The levels of CD3+, CD4+, CD4+/CD8+ at T1 were higher than T0 in two groups, The levels of CD3+, CD4+, CD4+/CD8+ at T2 were superior than at T0 and T1. The level of CD8+ at T1 was below at T0, The level of CD8+ at T2 was inferior than those in T0 and T1, The levels of CD3+,CD4+,CD8+ and CD4+/CD8+ at different time points were significant difference. The levels of CD3+, CD4+, CD4+/CD8+ in the observation group were significantly higher than those in the control group T1 and T2, CD8+ level was significantly lower than that in the control group at T1 and T2, difference between the two groups was statistically significant. Conclusion: Bifidobacterium triple viable powder adjuvant treatment ulcerative colitis was good for inhibiting body inflammatory response and improve immune function.

1. Introduction

Ulcerative colitis was a kind of common non-specific intestinal disease in clinic, which affected nutritional condition of patients severely with long course of disease, high incidence rate and recurrence rate[1], moreover there was mild inflammatory state and immune function decreased. In recent years, its incidence rate was in increasing trend, threatening people health seriously. At present pathogenesis of this disease still was unclear, however, the domestic and international researchers have found that alteration of intestinal flora played a role in the pathogenesis and progress of UC, rectified this alteration would be benefit for the treatment of this disease[2]. On the basis, this study obtained decent efficacy through applied bifidobacterium triple viable powder adjuvant therapy. This research summarized as following.

2. Material and method

2.1. Clinical data

Selected UC patients 80 cases who were admitted in department of gastroenterology from January 2014 to June 2016 in hospital according to serial number of grouping and divided them into the
control group and observation group, each group contained 40 cases. In the control group, 23 males, 17 females, aged from 20 to 56 years old, with an average (38.25±13.68) years old, course of disease was 6 months to 11 years with an average (5.25±3.75) years, the mild 11 cases, the moderate 17 cases and the severe 12 cases; In the observation group, 24 males, 16 females, aged from 19 to 55 years old, with an average (38.41±13.68) years old, course of disease was 4 months to 12 years with an average (5.55±4.15) years, the mild 12 cases, the moderate 17 cases and the severe 11 cases. There was no obvious difference in the clinical baseline data such as gender, age, course of disease and state of illness (P>0.05).

2.2. Incorporation and exclusion criteria

Incorporation criteria: (1) Clinical syndrome, sign and colonoscopy and laboratory inspection were conformed to relevant diagnostic criteria of ‘Consensus and opinion of diagnoses and treatment standard of Chinese inflammatory bowel disease’, such as clinical features including diarrhea, bloody purulent stool, mild and moderate abdominal pain, feces tenesmus, increasing erythrocyte sedimentation; (2) Aged from 18 to 60 years old; (3) Without drug therapy in recent two weeks; exclusion criteria: (1) Combined with mental disease, malignant tumor, cardio-cerebral vascular disease and diabetes; (2) Combined with other gastrointestinal disease; (3) Female in gestation or sucking period; (4) Patients were bad compliance; (5) Accepted the other scheme in the midway of treatment.

2.3. Treatment method

Control group: Admission to hospital, gave health education positively, let patients strictly obey routine and do exercise moderately, reduced the enteral nutrition support in acute stage and guided patients low-fat, low-sugar and high-protein diet avoiding uptake seafood, bitter peppery and other irritant food in catabasis. In the meanwhile, treated with mesalazine enteric coatel and avoided uptake seafood,bitter peppery and other irritant food in catabasis. In the meanwhile, treated with mesalazine enteric coatel and guided patients low-fat, low-sugar and high-protein diet.

Observation group: Treated adjuvant with bifidobacterium triple viable powder (Trade name: Bifid triple viable, Shang hai Xinyi Pharmaceutical Co., Ltd, approved by S10970105) on the basis of control group treatment, 0.5 g/time, 3 times/d, continuous treatment for 3 months. Observation group: Treated adjuvant with bifidobacterium triple viable powder (Trade name: Bifid triple viable, Shang hai Xinyi Pharmaceutical Co., Ltd, approved by S10970105) on the basis of control group treatment, 0.5 g/time, 3 times/d, continuous treatment for 3 months.

2.4. Observation indexes

(1) Compared with the change of inflammatory factor index before treatment (T0), treatment for 1 month (T1), treatment for 3 month (T2) in two groups, including interleukin 6 (IL-6), C reactive protein (CRP) and tumor necrosis factor (TNF-α), IL-6 and CRP were detected by enzyme-linked immunosorbent assay (ELISA), TNF-α was measured by radioimmunoassay; (2) Compared the T lymphocyte subsets change in T0, T1, T2 in two groups, containing CD3+, CD4+ and CD8+, CD4+ /CD8+ detected by USA Beckmann Coulter Flow Cytometer.

2.5. Statistical method

Medical statistical software SPSS 17.0 was used for statistical analysis. All measurement data was showed by (x±s). If the data obeyed normal distribution, would adopt the single factor repeat measurement for analysis of variance and + t-test. P<0.05 was defined as statistical significant difference.

3. Results

3.1. Serum inflammatory factors change level at T0, T1, T2 in two groups before and after treatment

Serum IL-6, CRP and TNF-α level at T1 was lower than T0, level of serum IL-6, CRP and TNF-α at T2 was lower than T0 and T1 in this two groups. Serum IL-6, CRP and TNF-α level at different time points was significant difference (all was P<0.05); The levels of serum IL-6, CRP and TNF-α in observation group at T1 and T2 were significantly lower than those in control group, there was significant difference in both groups (P<0.05). As shown in Table 1.

Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Time</th>
<th>IL-6 (pg/mL)</th>
<th>CRP (mg/L)</th>
<th>TNF-α (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T0</td>
<td>211.36±47.83</td>
<td>82.58±23.19</td>
<td>209.85±58.92</td>
</tr>
<tr>
<td>Observation group</td>
<td>40</td>
<td>T1</td>
<td>112.82±38.29</td>
<td>56.7±11.44</td>
<td>144.37±31.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2</td>
<td>72.17±15.18</td>
<td>21.19±10.72</td>
<td>83.28±31.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T0</td>
<td>207.83±45.66</td>
<td>83.09±24.72</td>
<td>211.18±61.23</td>
</tr>
<tr>
<td>Control group</td>
<td>40</td>
<td>T1</td>
<td>135.17±36.26</td>
<td>61.55±12.28</td>
<td>156.25±34.44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2</td>
<td>86.55±17.26</td>
<td>42.92±12.38</td>
<td>102.17±24.29</td>
</tr>
</tbody>
</table>

Note: Compared with T0: *P<0.05; compared with T0: **P<0.05; compared with the same time in control group: ***P<0.05.
3.2. Comparison of immune globulin level in both groups before and after treatment

Blood CD3+, CD4+, CD8+ and CD4+/CD8+ level in both groups were no significant difference (all was P>0.05). Blood CD3+, CD4+ and CD4+/CD8+ level at T1 in two groups was higher than at T0. Blood CD3+, CD4+, CD4+/CD8+ level at T2 in two groups was higher than at T0 and T1, CD8+ level at T2 was lower than at T0, T1 in both groups. Blood CD3+, CD4+, CD8+ and CD4+/CD8+ level at different time points were statistical significant difference (all was P<0.05).

When blood CD3+, CD4+ and CD4+/CD8+ level at T1 and T2 in observation group obviously exceeded that in control group at T1 and T2, the CD8+ level was significant lower than that at T1 and T2 in control group. The difference in two groups was statistical significant (all was P<0.05), as shown in Table 2.

4. Discussion

UC was a common alimentary canal non-specific inflammatory lesion, often occurred in bowel and colon sigmoideum, but not limited in colonic mucosa and submucosa, it also can result in multi-systems inflammatory response and it had a certain malignant transformation rate[4]. The long term clinical research revealed that there was not only obvious diarrhea, bloody stools, mild and abdominal pain in patients, but in the same time with distinguishing constitutional symptoms such as fever, emaciation hypoproteinemia and anemia[5]. A plenty of literatures reported that the high level of inflammatory factors in the active stage of UC patients was the key factor that led to complication and constitutional symptoms, moreover immune function significantly decreased and incidence of infectious disease was relatively high[6,7]. At present, treatment for UC patients was mainly drugs including hormone, 5-aminosalicylic acid and Salazosulfadimidine and so on, although this kind of drugs could control clinical symptoms effectively, its recurrence rate was high, its effect on inflammatory response and immune function was unsatisfied in the clinic.

In recent, domestic and international research found that content of lactobacillus and other anaerobic bacteria in UC patients active stage were significantly below than that in the normal population, however, these content increased dramatically in convalescent phase, this suggested that alteration of intestinal flora played a role in the pathogenesis and outcome of UC[8]. Inland He Jiayu et al[9] found that probiotics had good effect on regulate balance of intestinal flora and reduce inflammatory response through applied mesalazine with bifidobacterium triple viable powder for UC patients. Han Jinli et al[10] demonstrated that probiotics was beneficial for decreasing unwelcome reactions and reducing recurrence rate through combined bacillus subtilis double viable enteric capsule with 5-aminosalicylic acid for UC patients. In this study, adopted bifidobacterium triple viable powder adjuvant therapy for UC patients, results displayed that inflammatory factors of this group decreased significantly, which serum IL-6, CRP and TNF-α level was dramatically lower after treatment one month and three months than that in the patients without probiotics treatment. Change of immune globulin suggested that blood CD3+, CD4+, CD4+/CD8+ level was increased and CD8+ level was decreased obviously in the patients with bifidobacterium triple viable powder adjuvant therapy, which was superior than that in the patients with conventional treatment in the corresponding period. This was conformed to results of He Jiayu[9], Han Jinli[10].

It was considered that bifidobacterium triple viable powder was a probiotics preparation that applied for disease of digestive tract, adjuvant therapy for UC patients with resisting digestion of digestive enzyme, adhering and planting intestinal mucosa, recovering intestinal flora balance[11].

The main mechanism was following: On the one hand, activated probiotics in the bifidobacterium triple viable powder multiplied largely in intestinal canal, increased the constituent ratio of beneficial bacteria in colorectum, moreover inhibited reproduction of pathogenic bacteria and reduced its harmful effect and were helpful to improve nutrition absorption and reduce inflammatory reaction resulted from pathogenic bacteria[12]. On the other hand, it was able to increase phagocytic ability of macrophage in gastrointestinal tract, stimulate body to secrete a mass of IgA, IgG, lengthen the lifetime of T lymphocytes, mediate and regulate phagocytosis, inhibit release of TNF-α, increase immune function of intestinal mucous cell, consequently reduce inflammatory reaction[13–18]. At last, they combined with epithelial cells after long-type bifidobacterium,
lactobacillus acidophilus and enterococcus faecalis adhering to intestinal mucous, promoted intestinal mucous epithelial cells to secrete a lot of slime and formed a protective barrier, thereby actively inhibited the invasion of pathogenic bacteria, and had excellent effect on wound recovery and delay recurrence[19-21].

In conclusion, bifidobacterium triple viable powder adjuvant therapy for UC could effectively control inflammatory factor level, improve immune globulin content. It was worthy of clinical application due to its treatment efficacy.

Reference


