

Effect of gluten-free diet on clinical gastrointestinal symptoms of non-celiac patients with diarrhea-predominant irritable bowel syndrome

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ABSTRACT

Introduction: Irritable bowel syndrome is a chronic gastrointestinal disorder characterized by symptoms including abdominal pain or discomfort associated with changes in bowel movements (diarrhea or constipation). The association between gluten exposure and the onset of symptoms of irritable bowel syndrome is complex and not well understood. However, some patients experience the benefits of a gluten-free diet based on personal advice or decision. Studies have shown that patients with IBS with predominant diarrhea who do not have celiac disease experience an improvement in symptoms on a gluten-free diet. Therefore, this study aimed to evaluate the effect of a gluten-free diet on clinical gastrointestinal symptoms of non-celiac patients with diarrhea-predominant irritable bowel syndrome (IBS-D).

Material and Methods: This study was performed as a clinical trial on 100 patients with irritable bowel syndrome with predominant diarrhea. Patients were divided into two groups, and in the case group, the gluten-free diet and the control group continued the regular diet. For all patients at the initial visit after IBS diagnosis, the initial symptoms of the disease and the standard IBS severity questionnaire were completed, and then the symptoms and severity of the disease were evaluated weekly for four weeks.

Results: The mean severity of IBS symptoms at the beginning of the intervention in control and GFD groups was 28 and 29.09, respectively (p-value <0.05). The present study results showed that there was no significant difference between the two groups in none of the evaluated times (first to the fourth week). However, the severity of symptoms decreased over time in both groups, but the results showed no difference in duration of symptom severity between the two groups, and in both groups, the severity of symptoms decreased equally during the study period. In the final week of treatment, the symptoms of abdominal pain, especially abdominal distension, were slightly better in the GFD group than in the control group and instead had a slightly greater effect on daily activities.

Conclusion: The results of the present study showed that a gluten-free diet did not affect reducing the symptoms of patients with diarrhea-predominant irritable bowel syndrome, although more studies are recommended due to the limited studies

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INTRODUCTION

About half of patients seeking primary medical care for gastrointestinal complaints suffer from functional disorders, particularly irritable bowel syndrome (IBS). (1) Irritable bowel syndrome is a chronic gastrointestinal disorder characterized by a range of symptoms, including abdominal pain or discomfort associated with altered bowel movements (diarrhea or constipation). This disorder occurs in the absence of any organ dysfunction and is considered a functional disorder. (2, 3) Studies over the past two decades show that 10 to 20 percent of the general population experience IBS-like symptoms. (4) This syndrome is a disorder of young people, and most cases of the disease appear under the age of 45 years. IBS is diagnosed in women 2 to 3 percent more often than men in Western societies, and women make up 80 percent of all IBS patients. (5) IBS has three subtypes: Dominant Diarrhea (IBS-D), Dominant Constipation (IBS-C), and Mixed Disease (IBS-M). Diagnosis is based on the evaluation of symptoms using Rome III criteria. (6)

KEYWORDS:

Irritable bowel syndrome,
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Severity of symptoms,
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The association between exposure to gluten and the onset of symptoms of irritable bowel syndrome is complex and not well understood; however, some patients experience the benefits of a gluten-free diet based on personal advice or decision. (7) The prevalence of celiac disease in patients with chronic functional diarrhea or people with IBS predominant diarrhea is almost the same as in the healthy control group. (8) Studies have shown that patients with predominant diarrhea IBS who do not have celiac disease and are HLA-DQ2 / 8 positive can experience improved symptoms on a gluten-free diet. (7) Considering the observation of celiac disease-associated serum IgG in 37% of IBS-D patients, a compatible immune mechanism in response to gluten contact has been proposed to explain the improvement of symptoms by eliminating gluten from the diet. (9) Other factors, such as motility changes or bowel movements, intestinal permeability, or inflammation, may be related to immune mechanisms that may cause symptoms in IBS-D patients exposed to gluten. (7) Although many people use medication to treat functional disorders, two-thirds of these people also use diet or supplements as treatment. (10)) Some people with IBS report that consuming certain ingredients in their diet can trigger IBS symptoms in two-thirds of cases after eating. (11-13)

Increasing awareness of GFD (gluten-free diet) over the past decade has led to the growth of the gluten-free food industry, with more than \$ 15 billion in 2016 in the United States. (14, 15) While a gluten-free diet is recognized as the mainstay of treatment for patients diagnosed with celiac disease(16) , this study aimed to investigate the effect of a gluten-free diet on the gastrointestinal symptoms of non-celiac predominant diarrhea IBS patients.

MATERIAL AND METHODS

This study was performed as a clinical trial after receiving the code of ethics IR.SSU.MEDICINE.REC.1398.312 on patients with irritable bowel syndrome with predominant diarrhea. Patients referred to gastrointestinal clinics were evaluated for warning signs, including the new onset of symptoms at age 50 and older, weight loss, nocturnal diarrhea, anemia, bloody stools, and a family history of colon cancer. If there were no warning signs, patients diagnosed with irritable bowel syndrome (IBS) by a gastroenterologist based on ROME III criteria and were at least 20 years old were included in the study. Patients with a history of surgery, exacerbation of intestinal symptoms with consumption of milk or dairy products, underlying diseases such as diabetes, celiac disease, and abnormal laboratory findings, and known gastrointestinal diseases such as cirrhosis, IBD, ... were excluded from the study. Patients were divided into two groups using the table of random numbers, and in the case group, the gluten-free diet and the control group continued the regular diet. In order to guide the patients, a list of gluten-containing foods was provided to the patients in the case group. All patients in both groups were treated with nortriptyline 10 mg daily and Mebeverine hydrochloride 200 mg daily for the study duration. For all patients at the initial visit, the IBS severity questionnaire was completed, and then for four weeks, patients were visited weekly, and the IBS severity questionnaire was completed.

RESULTS

In this clinical trial study, patients with irritable bowel

syndrome randomly were divided into two groups of 50 patients on a regular diet and 50 patients on a gluten-free diet for four weeks. The mean age of patients in the control group was 30.96 ± 8.29 and in the GFD group was 33.86 ± 8.41 years. In the GFD group, 24 (48%) were male and 26 (52%) were female and in the control group, 21 (42%) were male and 29 (58%) were female (p-value = 0.54).

The severity of IBS symptoms at the beginning of the study in the control and GFD groups were 28 and 29.09(p-value=0.73). At the end of the first week, 24.45 and 25.18 (p-value=0.37), and 22.5 and 22.61(p-value=0.98) at the end of the second week. At the end of the third week, 20.76 and 20.62(p-value=0.87) and 18.7 and 19.07(p-value=0.67) at the end of the fourth week. The mean symptom severity in patients with IBS decreased in the two groups from the beginning to end, but there was no significant difference between the two groups in any of the evaluated times. The results of the Repeated Measure test showed that there was no difference between the two groups in reducing the severity of symptoms over time, and in both groups, the severity of symptoms decreased equally during the study time. However, the reduction in abdominal pain and abdominal distention in the GFD group was slightly more significant than in the control group, but the improvement in daily activities was slightly more significant in the control group.

DISCUSSION

Irritable bowel syndrome is one of the most common gastrointestinal disorders characterized by chronic abdominal pain and changes in bowel movements in the absence of any organ disorders. Depending on the severity of the symptoms, people with the disease experience impairment in quality of life and daily functioning. The approximate prevalence of irritable bowel syndrome is about 5-20%, and it affects both genders at different ages, although it is more common in women and young people.

Due to the nature of the disease, there is no definitive treatment for patients with irritable bowel syndrome; however, identifying the causes or factors that aggravate the disease and helping the patient better adapt to it and using existing treatments can effectively control patients' symptoms. Recommendations for lifestyle modification and avoiding aggravating foods are part of non-pharmacological treatment. In general, certain foods such as fatty foods, legumes, and other foods that produce gas, caffeine, alcohol, and lactose in patients with lactase deficiency may exacerbate or cause symptoms in some patients. In evaluating diets, wheat is one of the most important causes of gastrointestinal symptoms. Fructans are especially important because they absorb fewer carbohydrates and can induce symptoms. Studies have shown that patients with irritable bowel syndrome are four to seven times more likely to develop celiac disease than others. Because of this potential overlap, routine tests for celiac disease are also performed during the diagnosis of irritable bowel syndrome.

Studies have shown that gastrointestinal symptoms of IBS in patients with non-celiac irritable bowel syndrome sometimes decrease after a gluten-free diet. However, in small numbers, symptoms of IBS persist after a change in diet. Fructan in wheat is a carbohydrate (FOODMAP); It is most likely responsible for multiple digestive problems in IBS patients.

Wahnschaffe et al. showed that After six months of a gluten-free diet in patients, stool frequency and gastrointestinal symptoms improved in 60% of patients who tested positive for HLA-DQ2 and serum IgG associated with celiac disease and 12% in patients who tested negative. (9) This study aimed to evaluate the effect of a gluten-free diet on clinical gastrointestinal symptoms of IBS patients with predominant non-celiac diarrhea as a clinical trial in 100 patients. The results of the present study showed that during one month of follow-up, the symptoms and severity of IBS were reduced in both the regular diet and the gluten-free diet (GFD), But this decrease was not statistically significant between case and control groups. However, in the fourth week, abdominal pain and bloating were slightly less in the gluten-free group than in the control group, and the intensity of the effect on daily activities was slightly higher than the control group. It should be noted that one of the reasons for the insignificance of the results can be drug treatment in both groups. Also, non-compliance with the diet recommended to the intervention group was one of the limitations of the present study, which, of course, tried to reduce this possible error with repeated follow-ups.

Vazquez et al. Showed that four weeks of a gluten-free diet in IBS patients with predominant diarrhea significantly reduced the frequency of defecation compared to the control group. Consistency and Ease of Passage were not different between the two groups. In the study by Vazquez et al., Unlike in our study, patients were not treated with medication, and only the effect of diet was assessed. (7)

In another clinical trial, 37 non-celiac patients with IBS underwent a FOODMAPs reduction regimen for two weeks and then for one week in three groups: high gluten (16 g / day), low gluten (2 g / day), and the controls were evaluated. In all patients, gastrointestinal symptoms improved significantly during reduced FODMAP intake but worsened significantly when their diet contained gluten or whey protein. (17)

Aziz et al. Showed that a 6-week gluten-free diet reduced the IBS symptom severity score in 71% of patients, the same rate in both HLA-DQ groups. However, patients with negative HLA-DQ2 / 8 had a more significant reduction in abdominal distention. In the present study, the severity of IBS symptoms similar to the Aziz study decreased from 29.9 to 19.07, but considering the drug treatment in both groups, the effect of a gluten-free diet did not have a significant effect on symptom control. (18)

The findings of Rodrigo et al. On 97 patients with IBS showed that a one-year gluten-free diet did not reduce the severity of abdominal pain, fatigue, quality of life, and psychological scores. In contrast to Rodrigo's study, in our study, the severity of symptoms was reduced in both the GFD group and the regular diet, and the reason for the lack of reduction in symptoms in Rodrigo's study was patients' non-adherence to a gluten-free diet due to prolonged follow-up. (19)

A systematic study by Dione et al. Showed that GFD was associated with a reduction in IBS symptoms but was not statistically significantly different from the control group, which was consistent with the present study. However, the low FODMAP diet was associated with a significant reduction in the severity of IBS symptoms compared to the control group. This systematic study showed that the evidence to confirm the effectiveness of GFD in reducing the symptoms of patients with IBS is limited. Also, due to the difficulty of following the diet, other factors such as undiagnosed celiac disease can impair the effectiveness of GFD. (20)

One of the most significant limitations of the present study was

the non-adherence of the diet by patients and the concomitant drug treatment, which made it difficult to assess the effect of a gluten-free diet accurately. It seems that longer follow-up of patients and more extensive studies in a controlled manner are necessary.

CONCLUSIONS

Based on the results of this study, it appears that a gluten-free diet did not reduce the severity of patients' symptoms, although the severity of some symptoms such as abdominal pain and bloating was lower in the GFD group at the end of treatment. Lack of proper adherence to diet and adjuvant medication in both groups is one of the possible influential factors in this lack of difference between the two groups, and this finding provides the basis for further studies because its real impact is still challenging in various studies.

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