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Original Article

Impact of Gluten on Irritable Bowel Syndrome

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ABSTRACT

Objective: To assess the impact of a gluten-free diet on the quality of life of patients managed for irritable bowel syndrome at a tertiary care hospital

Study Design: Prospective comparative study.

Place and Duration of Study: Department of Medicine/Gastroenterology, Pak Emirates Military Hospital, Rawalpindi Pakistan from Jul 2020 to May 2021.

Methodology: Two hundred patients with irritable bowel syndrome and diagnosed on the basis of Rome-IV criteria were included in this study. They were divided into two groups via a lottery method. Group-1 received treatment as usual, depending upon the type of irritable bowel syndrome. Group-2 received treatment as usual and a gluten-free diet. Quality of life was assessed after one month using the World Health Organization Quality of Life-Brief scale.

Results: Out of 200 patients with irritable bowel syndrome included in the study, 93(46.5%) were male, while 107(53.5%) were female. 125(62.5%) had good quality of life after one month of treatment, while 75(37.5%) had lesser quality of life. Statistical analysis revealed that irritable use of a gluten-free diet had a statistically significant relationship (p-value<0.001) with good quality of life after one month of treatment in study participants.

Conclusion: After one month of treatment, good quality of life was found in many patients with irritable bowel syndrome. The use of a gluten-free diet in addition to treatment, as usual, was associated with good quality of life than routine treatment in these patients.

Keywords: Gluten, Irritable bowel syndrome, Quality of life.

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INTRODUCTION

Gluten is one of the essential nutrients in various dietary regimes used in different cultures across the globe.[1] Despite its positive role in maintaining gut motility and other domains, it can precipitate or aggravate certain gastrointestinal or even extra-intestinal disorders.[2,3] Celiac disease, irritable bowel syndrome, dermatitis herpetiformis, gluten ataxia, wheat allergy, and non-celiac gluten sensitivity are common disorders related to the presence of Gluten in the diet.[4,5]

The gluten-free diet has usually been used in the management of celiac disease.[6] However, several studies have highlighted this diet's importance in treating irritable bowel syndrome as well. Volta *et al*.[7] proposed that gluten or wheat insensitivity can present a wide range of symptoms in patients clinically diagnosed with irritable bowel syndrome. Rej *et al*.[8] emphasized that evidence is convincing regarding the role of Gluten in precipitating or aggravating the symptoms of irritable bowel syndrome. Currently, a gluten-free diet is not FDA approved treatment for this condition. Usai-Satta *et al*.[9] concluded that there could be a possible relationship between a gluten-free diet and a reduction in symptoms of irritable bowel syndrome.

All chronic medical conditions, somehow or the other, impact the overall quality of life of the individual. Dietary modification is usually considered a simple or basic treatment modality for any condition, which, if effective considered a first-line option for management. Limited local data is available regarding the impact of a gluten-free diet on patients with irritable bowel syndrome. However, local studies have revealed a quite high prevalence of this condition in our part of the world.[10] We planned this study to assess the impact of a gluten-free diet on the quality of life of patients managed for irritable bowel syndrome at our hospital.

METHODOLOGY

The prospective comparative study was conducted at the Gastroenterology/Medicine Department of Pak Emirates Military Hospital, Rawalpindi Pakistan from July 2020 to May 2021, after approval

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from Institutional Review Board Committee (via letter no A/28/EC/294/2021). The sample size was calculated using the WHO sample size calculator taking the population prevalence of response to the gluten-free diet in irritable bowel syndrome patients as 67%.[11]

Inclusion Criteria: Patients of both genders, aged 18bto 60 years presenting with irritable bowel syndrome were included in the study. Both newly diagnosed and old cases not in remission were included.

Exclusion Criteria: Patients of IBS with any other gastric or skeletal abnormalities or rheumatological conditions were part of the exclusion criteria. Patients with malignancies, a history of renal or autoimmune disease, or a diagnosis of celiac or inflammatory bowel disease were excluded as well. Patients taking medications other than treatment for irritable bowel syndrome, which could interfere with gastric symptoms, were also not included in the study. Patients with illicit or psychotropic drugs (other than part of treatment as usual for irritable bowel syndrome) were also excluded. Patients who refused to follow gluten-free diet patterns were not included as well.

Non-probability consecutive technique was used to gather the sample for the study. Irritable bowel syndrome was diagnosed by a consultant medical specialist or gastroenterologist based on Rome IV criteria, and three classes were identified as diarrhoea, constipation and mixed bowel patterns.[12] Written informed consent was obtained from all the study participants. They were randomly divided into two groups via a lottery method. Group-1 received treatment as usual, depending upon the symptoms and type of irritable bowel disease. Group-2 received treatment as usual and a gluten-free diet. Patients in the gluten-free diet group were asked to restrain from wheat, rye, bakery products, pasta, noodles, graham flour, drinks like beer, and potential sources of hidden Gluten such as candy, gravy, sauce, and lipstick.[13] After four weeks, independent assessor who was blind regarding the distribution of patients in groups assessed the quality of life in study participants via World Health Organization Quality of Life (WHOQOL)-BREF scale. It is 26 item scale with four domains. Scoring has been explained in detail by the team of WHO.[14] Transformed scores have been obtained from raw scores and range from 4–20, with scores 4-12 denoting lesser quality of life and scores 13–20 better quality of life.[14] Resaearch team was thoroughly trained on scoring of WHOQOL- BRIEF scale before the commencement of study.

Characteristics of participants and the distribution of the patients according to quality of life were described by using descriptive statistics. Relationship of age, gender, type of irritable bowel syndrome and use of gluten-free diet was assessed with the quality of life by using the Pearson chi-square test. All the data was processed in Statistics Package for Social Sciences version 23.0 (SPSS-23.0). The *p*-values≤ 0.05 depicted significant relationships between the study variables.

RESULTS

A total of 200 patients with irritable bowel syndrome managed at the Gastroenterology Unit of our hospital were included in the study. Of these, 93(46.5%) were male, while 107(53.5%) were female. The mean age of the study participants was 37.33± 8.559 years. Out of 200 study participants, 125(62.5%) had good quality of life after one month of treatment, while 75(37.5%) had lesser quality of life even after one month of treatment (Table-I).

Table-I: Characteristics of patients presenting with Irritable Bowel Syndrome (n=200)

Study Parameters	n(%)
Age (years) Mean±SD Range (min-max)	37.33±8.559 19 years-58 years
Mean duration of symptoms	48.43±S.977 days
Gender	
Male	93(46.5%)
Female	107(53.5%)
Treatment group	
Treatment as usual	102(51%)
Treatment as usual+ gluten free diet	98(49%)
Type of Irritable bowel syndrome	
With diarrhea	79(39.5%)
With constipation	82(41%)
With mixed bowel pattern	39(19.5%)
Quality of life	
Better	125 (62.5%)
Lesser	75 (37.5%)

As per Rome IV criteria, 79(39.5%) had irritable bowel syndrome with diarrhoea, 82(41%) had constipation, and 39(19.5%) had mixed bowel symptoms. 102(51%) received treatment as usual, while 98(49%) received treatment as usual plus a gluten-free diet. It was revealed that type (with diarrhoea, constipation and mixed bowel pattern) of irritable bowel syndrome (*p*-value<0.001) and use of a gluten-free diet had a statistically significant relationship (*p*-value-0.001) with good quality of life after one month of treatment in study participants. In contrast, age (*p*-value-0.844) and gender (*p*-value-0.399) had no statistically significant relationship (Table-II).

Table-II: Association of different variables with Quality of life among patients managed for Irritable Bowel Syndrome (n=200)

Factors	Better Quality of Life	Lesser Quality of Life	*p*-value
Age			
40 year or less >40 years	85(68%) 40(32%)	52(69.3%) 23(30.7%)	0.844
Gender			
Male Female	61(48.8%) 64(51.2%)	32(42.7%) 43(57.3%)	0.399
Type of irritable bowel syndrome			
With diarrhea With constipation With mixed bowel pattern	63(50.4%) 46(36.8%) 16(12.8%)	16(21.3%) 36(48%) 23(30.7%)	<0.001
Treatment group			
Treatment as usual Treatment as usual+ gluten free diet	52(41.6%) 73(58.4%)	50(66.7%) 25(33.3%)	0.001

DISCUSSION

Irritable bowel syndrome is a chronic condition primarily involving the gut, and symptoms generally remain confined to the GI tract. When prolonged, symptoms like diarrhoea, constipation, abdominal pain and bloating affect the overall quality of life of patients suffering from this motility disorder.[15] Multiple treatment options are used for irritable bowel syndrome depending upon type and predominant symptoms. We planned and conducted this study intending to assess the impact of a gluten-free diet on the quality of life of patients managed for irritable bowel syndrome at a tertiary care hospital. Zanwar *et al*.[16] revealed that patients showed improvement in all the symptoms of irritable bowel syndrome when put on a gluten-free diet. Symptom intensity was increased along with fatigue when they were re-challenged with a gluten-containing diet. Our study design was slightly different, and we targeted overall quality of life and found out it was better in those who used a gluten-free diet than those who took routine treatment of irritable bowel syndrome but not a gluten-free diet.

Paduano *et al*.[17] concluded that all three diets reduced symptom severity and improved quality of life. Most of the patients included in the study preferred a balanced diet. The authors also recommended a balanced diet among these patients. We did not compare different diets but found that a gluten-free diet improved quality of life compared to routine treatment and routine daily diet. A systematic review and meta-analysis published by Dionne *et al*.[18] evaluated the efficacy of a gluten-free diet and a low FODMAPs diet in treating symptoms of Irritable Bowel Syndrome. They came up with the findings that evidence is low to support the role of both diets in reducing the symptoms of irritable bowel syndrome, and more research is required in this regard. Barmeyer *et al*.[19] studied the impact of a gluten-free diet on the quality of life of patients with diarrhoea-dominant and mixed-type irritable bowel syndrome. A gluten-free diet improved the quality of life of more than2/3rd of their patients. Our results supported the findings of the study generated by Barmeyer *et al*. and most of our patients on gluten-free diets showed significant improvement in quality of life after one month of treatment.

LIMITATIONS OF STUDY

The main limitation of our study was not checking the quality of life at baseline. We included all types of patients with irritable bowel syndrome instead of including predominantly diarrhoea or mixed patients. We only followed the patients briefly and recorded the findings after one month of treatment. Studies with better design and long-term follow-up may generate better results.

CONCLUSION

After one month of treatment, good quality of life was found in many patients with irritable bowel syndrome. The use of a gluten-free diet in addition to treatment, as usual, was associated with good quality of life than routine treatment in these patients.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SU: & MZA: Conception, study design, drafting the manuscript, approval of the final version to be published.

NS: & AH: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

MW: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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