RESEARCH PAPER

Effect of Low Fodmap Diet and Aerobic Exercises on Irritable Bowel Syndrome in Post-Menopausal Women

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ABSTRACT

Background: Irritable bowel syndrome (IBS) represents one of the commonest conditions that affects the way the gut and brain interaction. Patients with IBS often have abdominal pain and changes in their bowel habits. Aim of the study: This study investigated the influence of a low FODMAP dietary regimen combined with aerobic exercise on IBS manifestations among postmenopausal women. **Material and Methods:** Forty women were chosen from YAZ outpatient clinics in Giza, Egypt, who received a diagnosis with IBS according to Rome IV criteria They were between the ages of 50 and 60, and their BMI was below 30 kg/m2. The participants were distributed into two equivalent groups at random. Group A took-part on a treadmill three times weekly for six weeks as part of an aerobic fitness program. Each session lasted around thirty minutes. Group B followed the same exercise protocol in addition to receiving nutritional guidance regarding a low FODMAP diet. Pain intensity, IBS symptom severity, as well as quality of life were evaluated using the Visual Analogue Scale (VAS), IBS Severity Scoring System (IBS-SSS), along with IBS-QOL questionnaires at baseline and post treatment. **Results:** Participants in the combined intervention group (B) demonstrated greater improvement in pain and IBS symptom severity, together with marked enhancement in quality-of-life scores ($P<0.001$) compared with the exercise-only group (A). **Conclusion:** In conclusion, the integration of aerobic exercise and a low FODMAP diet could constitute a non-pharmacological approach that is effective in decreasing IBS symptoms along with enhancing the quality of life of postmenopausal women.

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INTRODUCTION

Irritable bowel syndrome (IBS) is considered a functional gastrointestinal condition defined by recurrent abdominal pain as well as abnormal bowel function. This disorder is more common in women than males and is rather prevalent in the whole world [1]. Although the exact aetiology remains uncertain, present evidence indicates that IBS results from a multifactorial interaction involving intestinal motility disturbances, visceral hypersensitivity, psychosocial stress, and impairment of the gut–brain axis [2]. Consistent bloating and abdominal pain accompanied by irregular bowel movements are the most frequent symptoms of IBS [3]. Alteration in bowel habits affect the frequency and intensity of pain. There may also be non-gastrointestinal symptoms that have an adverse effect on quality of life, including fatigue, anxiety, as well as depression [4]. The global prevalence of IBS in women was 67% more than in males and gender related differences in gastrointestinal and somatic symptoms are most prominent in postmenopausal women [5]. Recently, dietary interventions have gained increasing attention as an important component of IBS management. fermentable oligosaccharides, disaccharides, monosaccharides, as well as polyols (low FODMAP) diet in particular has shown encouraging results among these treatments [6]. Clinical trials have shown the LFD's efficacy, revealing that restricting foods rich in fermentable carbohydrates may reduce luminal distension and gas production, thereby alleviating gastrointestinal symptoms in about 70% of subjects [7].

MATERIAL AND METHODS

This study was a prospective, randomized, pre–test post-test, controlled trial. The study was conducted at YAZ clinics, El Sheikh Zayed city, Giza, Egypt between (December 2024) and (March 2026). Forty postmenopausal women who received a diagnosis of IBS according to Rome IV criteria by a gastroenterologist were chosen to take part in this study. They were between the ages of 50 and 60, and they were at least three to four years postmenopausal. Their BMI was below 30 km/m2. Participants were evaluated for study eligibility and then enrolled. After participants have been informed of the research's purpose, nature, and benefits, they are informed that they have the right to decline or withdraw from the study at any moment. Each participant gave their informed permission, which ensures that any information collected will remain secret. Each participant was randomized into one of two equivalent groups, A or B. Patients in Group A (n=20) participated in a 6-week aerobic

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exercise program that included walking on a treadmill (JSB, HF39 manufactured by India) three times per week. The following were the main points of each 30-minute session: Using the treadmill for five minutes at slow speeds as a warming up, twenty minutes at a moderate intensity (or 70% of your maximum heart rate), along with five minutes at a low speed as a cooling down. Group (B) (n =20), followed the same exercise protocol in addition to receiving nutritional guidance regarding a low FODMAP diet for 6 weeks.

Pain intensity, IBS symptom severity, in addition to quality of life were evaluated using the Visual Analogue Scale (VAS), IBS Severity Scoring System (IBS-SSS), and IBS-QOL questionnaire before and after treatment [8,9,10]. The IBS-SSS is a valid as well as reliable patient-based tool that measures the severity of IBS symptoms across ten days using 5 clinically significant items: (1) the frequency and (2) intensity of the abdominal pain is; (3) the amount of abdominal distension or tension; (4) dissatisfaction of the person is with their bowel habits; and (5) how IBS affects their quality of life. A greater score denotes worse conditions [9]. The IBS-QoL is a reliable instrument that includes 34 questions on IBS along with a 5-point Likert scale where 1 is not at all, 2 is slightly, 3 is moderate, 4 is quite a bit, and 5 is extremely much. A score (possible range 34–100; 100 = highest QoL) was created by adding together all of the elements [11].

Statistical analysis:

The results were presented as mean ± the standard deviation. We used the Kolmogorov-Smirnova test, a normality test, to examine the pre-treatment data was distributed. The variables in the two groups were compared utilizing an independent t test in cases where the data was normally distributed. The two groups' pre- and post-treatment values were compared using an analysis of covariance (ANCOVA) test, which allowed us to adjust for the impact of pre-treatment values. A dependent t test was utilized to compare the same group's data at baseline and post treatment. When the data was not normally distributed, the Mann-Whitney U test was utilized to compare the two groups' variables, while the Wilcoxon Signed Ranks test was utilized to compare the same group's data at baseline and post treatment. To conduct the statistical analysis for this study, we utilized the Windows version of SPSS. If the P value was 0.05 or below, it was considered significant.

RESULTS:

Forty postmenopausal women were randomized into one of the two groups. Group (A) (control group) comprised of 20 individuals and were given an aerobic exercise program consisting of walking on the treadmill for thirty minutes three times a week for a period of six weeks. Additionally, group (B) (the study group) comprised 20 individuals who were given a low-FODMAPS diet and an aerobic exercise protocol that included using a treadmill three sessions a week for 6 weeks, as described in the control group. All randomized participants completed the trial. Results of this study found that; at baseline, no significant difference was detected in the mean values of mean age, weight, height, as well as BMI among both groups A and B.

Post treatment, there was significant decrease in VAS scores between group A (21.01%), and B (60.71%) at posttreatment ($p < 0.001$), with favour of group B (Study Group) (table 1). Also, there was a significant increase in their QoL between group A (15%), and B (68.72%) at posttreatment ($p < 0.001$), with favour of group B (Study Group) (table 2). In addition, there was a significant decrease in their IBS-SSS between group A (24.9%), and B (71.31%) at posttreatment ($p < 0.001$), with favour of group B (Study Group) (table 3).

Table 1: Inter- and intra-groups comparison between values of VAS in the two studied groups measured at pre- and post-treatment.

	Group A (n= 20)	Group B (n= 20)	F value	P value
Pre-treatment	69.00 ± 5.98	70.00 ± 6.07	0.275	0.603 (NS)
Post-treatment	54.50 ± 5.36	27.50 ± 4.89	394.017	0.001 (S)
Mean difference	14.50	42.50		
% change	21.01 ↓↓	60.71 ↓↓		
t value	23.473	26.809		
p value	0.001 (S)	0.001 (S)		

Data are expressed as mean ± SD; F value= ANCOVA test, t value= paired t test; NS= p> 0.05= not significant; S= p≤ 0.05= significant.

Table 2: Inter- and intra-groups comparison between values of QoL questionnaire in the two studied groups measured at pre- and post-treatment.

	Group A (n= 20)	Group B (n= 20)	Z value	P value
Pre-treatment	52.65 ± 9.49	54.35 ± 6.71	0.728	0.393 (NS)
Post-treatment	60.55 ± 9.91	91.70 ± 2.56	29.340	0.001 (S)
Mean difference	7.90 ± 3.18	37.35 ± 6.16	-5.418	0.001 (S)
% change	15.0 ↑↑	68.72 ↑↑		
Z# value	-3.927	-3.923		
p value	0.001 (S)	0.001 (S)		

Data are expressed as mean ± SD; Z value= Mann-Whitney U test, Z#= Wilcoxon Signed Ranks test; NS= p> 0.05= not significant; S= p≤ 0.05= significant.

Table 3: Inter- and intra-groups comparison between values of IBS-SSS questionnaire in the two studied groups measured at pre- and post-treatment.

	Group A (n= 20)	Group B (n= 20)	Z value	P value
Pre-treatment	249.50 ± 29.11	257.25 ± 27.12	0.646	0.421 (NS)
Post-treatment	187.20 ± 21.72	73.80 ± 29.56	27.214	0.001 (S)
Mean difference	62.30 ± 12.77	183.45 ± 28.43	-5.425	0.001 (S)
% change	24.97 ↑↑	71.31 ↑↑		
Z# value	-3.932	-3.927		
p value	0.001 (S)	0.001 (S)		

Data are expressed as mean ± SD; Z value= Mann-Whitney U test, Z#= Wilcoxon Signed Ranks test; NS= p> 0.05= not significant; S= p≤ 0.05= significant.

DISCUSSION

The chronic disorder known as IBS is defined by recurrent symptoms that fluctuate in intensity [12]. IBS has a complex pathophysiology that consists of dysfunctions in motility, visceral sensation, brain-gut connection, and psychological as well as social distress [13]. Pain, bloating, cramping, along with either diarrhoea or constipation are some of the symptoms of IBS, and treating these symptoms is the goal of treatment. The main goals of management are providing emotional support and suggesting dietary changes [14]. Because certain foods may make IBS symptoms worse, changing one's diet is the first line of defense in the fight against these symptoms [15]. Of the several non-pharmacological approaches to IBS, LFD ranks high [16]. Seventy percent of individuals with IBS reported an improvement in their symptoms after implementing the LFD, according to clinical study. In addition to the benefits that have been reported from using that particular eating plan [7]. The findings of the current study demonstrated that combining aerobic exercise with a low FODMAP dietary approach resulted in greater clinical improvement than aerobic exercise alone. Participants who followed the dietary intervention showed significant reductions in pain intensity and IBS severity scores in addition to notable enhancement in quality-of-life measures.

These findings are in line with those of a recent randomized clinical study on 29 adults diagnosed with IBS using Rome IV criteria, which was carried out by Ankersen [17]. They compared low with moderate FODMAP diet. Ankersen and his colleagues [17] had stated that low FODMAP diet was more helpful for adults with IBS.

The findings of current trial came in line with Khalaf [1] who had investigated effectiveness of FODMAP diet and aerobic exercise on forty-five individuals of both genders (32 females, and 13 males), diagnosed with IBS post abdominal surgeries in Al-Tahrir General Hospital. Khalaf and his colleagues had stated that FODMAP diet, plus aerobic training (15-30 minutes on treadmill), had immediate substantial posttreatment therapeutic improvements in terms of IBS-SSS by 69.54%, and quality of life by 48.27% that came in line with the present clinical trial therapeutic gains. Furthermore, our gained results were supported by Prospero [18] (2021) who had addressed the associated psychological distress that induced depression by 31.4%, and anxiety by 37.1% among IBS individuals, even while following low FODMAD diet. In the same manner, Orlando [19] previously stated that, as in comparison with a control diet, the low FODMAP diet significantly improved QoL and decreased IBS severity.

IN CONCLUSION, the combined therapeutic approach used in this trial may therefore provide a practical non-pharmacological option for improving IBS-related symptoms among postmenopausal women.

RECOMMENDATIONS: It recommended that future research assess the long-term effectiveness and sustainability of this treatment using bigger sample numbers as well as longer follow-up periods.

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