

Efficiency of diet change in irritable bowel syndrome

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ABSTRACT

Background: Irritable bowel syndrome (IBS) is a chronic gastrointestinal disorder characterized by symptoms of abdominal pain, bloating, and altered bowel habit such as constipation, diarrhea, or both. Food is one of the most commonly reported triggers of IBS symptoms. We aim to assess the effect of diet change in improving IBS. **Methods:** This study was a cross-sectional study. A questionnaire was developed for data collection in the present study. The survey was distributed online in Arabic language. **Results:** A total of 1202 subjects participated in our study. Of these, 685 (57%) were female patients and 517 (43%) were male patients. The age of patients ranged from 15 to 55 years, more than one-third of them located in the age range between 15 and 25. The statistical analysis reported a significant correlations between having IBS for three successive days for 3 months regarding age and duration of IBS (P value <0.001), having depression or anxiety before, and if the depression affects IBS symptoms or not (P value = 0.013 and <0.001 , respectively). Having dietary regimen, advising to increase fibers, thinking about changing diet improves IBS symptoms (P value = 0.001, 0.005, and <0.001 , respectively) and having treatment (P value = 0.006). **Conclusion:** According to our results, the prevalence of IBS was higher among females. Some diets, especially onions, garlic, and coffee, were reported to increase the IBS symptoms. Decreasing carbohydrate diets and increasing fiber diet would enhance the patient health where the symptoms were decreased.

Keywords: Dietary regimen, gastrointestinal disorder, irritable bowel syndrome

Introduction

Irritable bowel syndrome (IBS) is a chronic gastrointestinal (GI) disorder characterized by symptoms of abdominal pain, bloating, and altered bowel habit such as constipation, diarrhea, or both.^[1] Although regional variation exists, the prevalence of IBS ranges from 10% to 15% in population-based studies in North America and Europe.^[2] Annually, in the United States, there are about 3.1 million ambulatory office visits and total expenditures exceeding \$20 billion.^[3,4] Geographic variations range from 7% in

South Asia to 21% in South America. The prevalence of IBS is most common between 20 and 40 years of age with a significant female predominance.^[5]

IBS can present with a wide range of both GI and extraintestinal symptoms. These include (1) chronic abdominal pain with variable intensity and periodic exacerbations; (2) altered bowel habits ranging from diarrhea, constipation, alternating diarrhea and constipation, or normal bowel habits alternating with either diarrhea and/or constipation; (3) diarrhea characterized by frequent loose stools of small-to-moderate volume; (4) prolonged constipation with interludes of diarrhea or normal bowel function with often hard, pellet-shaped stools and a sense of incomplete evacuation even when the rectum is empty; and (5) extraintestinal symptoms, such as impaired sexual function,

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dysmenorrhea, dyspareunia, increased urinary frequency and urgency, and fibromyalgia symptoms.^[2]

Patients believe that their symptoms are triggered by certain food items such as milk and milk products, wheat products, caffeine, cabbage, onion, peas, beans, hot spices, and fried and smoked food.^[6] Some IBS patients were avoiding several foodstuffs, but there does not appear to be any difference between them and the general population regarding the intake of energy, carbohydrates, proteins, and fats.^[7] However, one study found that 62% of IBS patients had either limited or excluded certain food items from their daily diet, and of these, 12% were at risk of long-term nutritional deficiencies.^[8]

Modification of diet is one of the most commonly used interventions for patients suffering with IBS.^[9] Fiber was considered a main therapeutic approach for IBS for a long time, although the mechanism of action is unknown. Fiber's beneficial effects may reflect colonic fermentation with production of short-chain fatty acids or its action as a prebiotic.^[10] Significantly restricted diets, termed as elimination diets, are also one of the approaches used in this aspect. Improvement of symptoms was noted in a clinical trial that included 25 patients. These patients followed a strict elimination diet consisting of distilled or spring water, one meat, and one fruit for 1 week. Two-thirds of patients who completed this diet noted symptom improvement followed by a worsening of symptoms when suspect foods were reintroduced.^[11]

We conducted this study to evaluate the efficiency of diet change in IBS.

Subjects and Methods

Study design

This study was a cross-sectional study.

Study population

Subjects who were diagnosed by gastroenterologist were invited to participate in our study.

Inclusion criteria

- Patients who fulfilled the Rome III criteria for the diagnosis of IBS were included in the study
- Patients of both genders and aged between 15 and 55 years were included.

Exclusion criteria

- Comprised the presence of organic GI or other systemic diseases, women who were pregnant or lactating, drug abuse, serious psychiatric diseases, and cooperation issues
- In addition, patients who had undergone abdominal surgery were excluded except for appendectomy, cesarean section, and hysterectomy.

Study duration

The study duration was between April and May 2018.

Questionnaire design

A questionnaire was developed for data collection in the present study. The first part of the questionnaire was concerned with the demographic features of the participants included age, residence, gender, weight, height, and history of chronic diseases. The second part of questionnaire was concerned with IBS manifestation; the first question in this part included eight subquestions. They were about duration of IBS, symptoms of disease, having symptoms for three successive days in three successive months, suffering from diarrhea, constipation in the morning, suffering depression or anxiety, effect of depression on IBS symptoms, receiving IBS treatment, and if the patients have dietary regimen. The third part was concerned with the foods which were asked by physicians to be avoided and was physician asking them to increase the intake of foods rich in fibers or decreasing foods containing starch. Finally, the participants were asked if they thought that the nature of food would help in the IBS and chronic diseases treatment. The survey was distributed online in Arabic language.

Statistical analysis

Data were analyzed using Statistical Package for the Social Sciences software version 16 (IBM SPSS Statistics), simple descriptive analysis in the form of numbers and percent for qualitative. Mean and standard deviation for quantitative variables chi square were used as a test of significance to compare qualitative variables significant level of less than 0.05.

Results

A total of 1202 subjects participated in our study. Of these, 685 (57%) were female patients and 517 (43%) were male patients. The age of patients ranged from 15 to 55 years, more than one-third of them located in the age range between 15 and 25. Their residence was between Dammam (22%), Riyadh (27.7%), Al Madinah (25.2%), and Makah (25.1%). The mean weight was 73.63 kg while the mean height was 162.95 cm with body mass index of 27.34 kg/cm². Sixteen percent of our participants were suffering from diabetes mellitus, 10.8% chest diseases, 9.2% hypertension, 5.7% kidney diseases, 5.4% heart disease, 4.8% rheumatoid arthritis, and 4.7% liver diseases [Table 1].

The second part of questionnaire concerned with IBS manifestation, the first question in this part concerned with the duration of IBS, 37.4% was diagnosed with the disease from 1 to 5 years, 32.1% was diagnosed from more than 5 years, 20.1% from 1 month to 1 year, and the remaining 10.3% was recently diagnosed (from less than 1 month). Regarding the symptoms of IBS, the most common symptoms among our participants were swelling 23.6% and gases 22.1%. Contractions, nausea, and vomiting were also reported among our participants. About half of participants (52.3%) had symptoms for three successive days in three successive months. Majority of participants (74%) were

Table 1: Sociodemographic data

	n (%)
Sex	
Female	685 (57.0)
Male	517 (43.0)
Age	
15-25	445 (37.0)
26-40	432 (35.9)
41-55	325 (27.0)
Residence	
Dammam	264 (22.0)
Riyadh	333 (27.7)
Al Madinah	303 (25.2)
Makah	302 (25.1)
Weight (mean±SD)	73.63±18.9
Height (mean±SD)	162.95±15.2
BMI (mean±SD)	27.34±6.6
Do you have a diseases	
Liver diseases	56 (4.7)
Kidney diseases	68 (5.7)
Chest diseases	130 (10.8)
Heart diseases	65 (5.4)
Others	521 (43.3)
Diabetes mellitus	192 (16.0)
Hypertension	111 (9.2)
Rheumatoid arthritis	58 (4.8)

BMI: Body mass index; SD: Standard deviation

suffering from diarrhea and constipation in the morning. Also, the depression and anxiety are common among IBS patients, where 81.9% of our participants suffering from depression or anxiety. About 41.2% thought that depression affect IBS symptoms. More than half (64.2%) received IBS treatment. About one half (52%) had dietary regimen while the second half (48%) had not [Table 2].

Table 3 shows the foods which were advised to be avoided, grouped into categories, most often cited as causing or worsening GI symptoms in the IBS patients; onions were the most frequently reported food type thought to affect IBS symptoms (59.9%). About almost half of the IBS patients stated that garlics, in particular, contributed to the symptoms. Around 34.9% were advised to avoid eating strawberry. Milk product, coffee, cinnamon, mulberry, apples, pearly, ginger, almond, and oats were also reported as problematic.

The third part of our questionnaire concerned with how the physicians advised the patient to manage and enhance their health. About 60.3% advised their patients to increase fibers in their meals, while 55% advised them to decrease carbohydrates in their diet. Around 70.6% thought that changing diet improves IBS symptoms; in addition, 65.7% thought that changing diet improves chronic disease symptoms [Table 4].

The statistical analysis reported a significant correlation between having IBS for three successive days for 3 months regarding age and duration of IBS (P value < 0.001) where most of participants

Table 2: Manifestation of disease

Variable	Number	Percent
Duration of IBS		
<1 months	124	10.3
Month to 1 year	242	20.1
1-5 years	450	37.4
>5 years	386	32.1
Symptoms of disease		
Swelling	284	23.6
Contractions	231	19.2
Gages	266	22.1
Nausea	182	15.1
Vomiting	157	13.1
Others	82	6.8
Having symptoms for 3 successive days in 3 successive months		
No	573	47.7
Yes	629	52.3
Suffering from diarrhea, constipation in the morning		
No	312	26.0
Yes	890	74.0
Suffering depression or anxiety		
No	217	18.1
Yes	985	81.9
Depression affect IBS symptoms		
No	271	22.5
Sometimes	436	36.3
Yes	495	41.2
Do you receive treatment		
No	430	35.8
Yes	772	64.2
Do you have dietary regimen		
No	577	48.0
Yes	625	52.0

IBS: Irritable bowel syndrome

who were having IBS for three successive days for 3 months had the age range (15–25 years) and diagnosed with IBS for more than 5 years [Table 5].

Table 6 shows the Relation of irritable bowel syndrome symptoms to depression factors. The statistical analysis reported that both of these correlations are significant (P value = 0.013 and < 0.001, respectively).

Table 7 shows significant correlation between having IBS for three successive days for 3 months regarding having dietary regimen, advising to increase fibers, and thinking about changing diet will improve IBS symptoms (P value = 0.001, 0.005, and <0.001, respectively). Also, we reported significant correlation between having IBS for three successive days for 3 months regarding to having treatment (P value = 0.006) [Table 8].

Discussion

There was a predominance with less number of females (57%) in the present study compared to the previous studies, which included 74% and 70% females and 91.1%.^[12-14]

Table 3: Diet advised to avoid

	n (%)
Strawberry	420 (34.9)
Cinnamon	200 (16.6)
Almonds	80 (6.7)
Apples	180 (14.9)
Onion	720 (59.9)
Ginger	86 (7.15)
Mulberry	196 (16.3)
Pearly	122 (10.1)
Oats	52 (4.3)
Garlic	550 (45.8)
Coffee	320 (26.6)
Milk products	350 (29.1)
Others (fats)	316 (26.3)

Table 4: The management of study group

	Frequency (%)
Do physician advice you to increase fibers	
No	477 (39.7)
Yes	725 (60.3)
Do physician advice you to decrease CHO	
No	541 (45.0)
Yes	661 (55.0)
Do you think change diet improve IBS symptoms	
No	353 (29.4)
Yes	849 (70.6)
Do you think change diet improve chronic disease symptoms	
No	412 (34.3)
Yes	790 (65.7)

IBS: Irritable bowel syndrome; CHO: Carbohydrate

In our study, the bowel gases were reported as one of the important symptoms of IBS, and onions and garlics were highly recommended to be avoided. These results can be explained as benefit from excluding gas-producing foods derived from fermentable substrates known to exacerbate symptoms. Foods associated with an increase in intestinal gas and flatulence include alcohol, apricots, bagels, bananas, beans, Brussels sprouts, caffeine, carrots, celery, onions, pretzels, prunes, raisins, and wheat germ.^[15]

Our results estimated that 60.3% of our patients were advised to increase fibers in their meals and also reported significant correlation between having IBS for three successive days for 3 months regarding to having dietary regimen, advising to increase fibers we can explained this result as, fiber can act as a bulking agent to improve intestinal transit and decrease constipation in a subgroup of IBS patients. Thus, dietary recommendations for IBS patients often include fiber supplementation, especially with soluble (psyllium/ispaghula husk) rather than insoluble (bran) fibers.^[16] Psyllium/Ispaghula should be started from low doses in order to avoid gas and abdominal bloating side effects.^[17]

We also reported that 55% were advised to decrease carbohydrates in their diet. The reason is FODMAP are short-chain poorly

Table 5: Relation of irritable bowel syndrome symptoms to demographic

	Having IBS for 3 successive days for 3 months		P
	No (573), n (%)	Yes (629), n (%)	
Age			
15-25	238 (53.5)	207 (46.5)	<0.001
26-40	206 (47.7)	226 (52.3)	
41-55	129 (39.7)	196 (60.3)	
Sex			
Female	325 (47.4)	360 (52.6)	0.857
Male	248 (48.0)	269 (52.0)	
Duration of IBS			
1-5 years	206 (45.8)	244 (54.2)	<0.001
Month to 1 year	138 (57.0)	104 (43.0)	
<1 month	91 (73.4)	33 (26.6)	
>5 years	138 (35.8)	248 (64.2)	

IBS: Irritable bowel syndrome

Table 6: Relation of irritable bowel syndrome symptoms to depression factors

	Having IBS for 3 successive days for 3 months		P
	No (573), n (%)	Yes (62), n (%)	
Having depression or anxiety before			
No	120 (55.3)	97 (44.7)	0.013
Yes	453 (46.0)	532 (54.0)	
Depression affect IBS symptoms			
No	157 (57.9)	114 (42.1)	<0001
Sometimes	218 (50.0)	218 (50.0)	
Yes	198 (40.0)	297 (60.0)	

IBS: Irritable bowel syndrome

absorbed carbohydrates and have been grouped together under this umbrella term because they all are rapidly fermented and are osmotically active, with additive effects. Feeding moderate amount of FODMAP to healthy individuals has no deleterious effects, but to patients with IBS often causes symptoms that mimic their IBS because of the response of their hypersensitive bowels to the luminal distension mediated by osmotic effects and/or rapid fermentation.^[17]

The results demonstrated a higher prevalence of IBS symptoms in patients with depression and anxiety. One of the most diagnosed psychiatric disturbances in IBS patients is depression. Many studies have evaluated the prevalence of anxiety and depression among patients with IBS, seeking care in gastroenterology units, but few studies have been done on IBS in psychiatric patients. An increased prevalence (27–47, 3%) of IBS in patients with major depression (onset or recurrent episode) was reported by several studies.^[18,19] More recently, a cross-sectional study investigated the prevalence of IBS symptoms in patients diagnosed with major depressive disorder (MDD).^[20] Fadgyas *et al.* demonstrated a higher prevalence of IBS symptoms in patients with depression compared with healthy subjects but patients with MDD in

Table 7: Relation of irritable bowel syndrome symptoms to dietary regimen

	Having IBS for 3 successive days for 3 months		P
	No (573), n (%)	Yes (629), n (%)	
Do you have dietary regimen			
No	325 (56.3)	252 (43.7)	0.001
Yes	248 (39.7)	377 (60.3)	
Do physician advice you to increase fibers			
No	251 (52.6)	226 (47.4)	0.005
Yes	322 (44.4)	403 (55.6)	
Do physician advice you to decrease CHO			
No	270 (49.9)	271 (50.1)	0.180
Yes	303 (45.8)	358 (54.2)	
Do you think change diet improve IBS symptoms			
No	194 (55.0)	159 (45.0)	<0.001
Yes	379 (44.6)	470 (55.4)	

IBS: Irritable bowel syndrome; CHO: Carbohydrate

Table 8: Relation of irritable bowel syndrome symptoms to treatment

Having treatment	Having IBS for 3 successive days for 3 months		P
	No (573), n (%)	Yes (629), n (%)	
No	228 (53.0)	202 (47.0)	0.006
Yes	345 (44.7)	427 (55.3)	

IBS: Irritable bowel syndrome

remission did not differ from healthy controls in reporting GI symptoms.^[21]

Conclusion

According to our results, the prevalence of IBS was higher among females. Some diets, especially onions, garlic, and coffee, were reported to increase the IBS symptoms. Decreasing carbohydrate diets and increasing fiber diet would enhance the patient health where the symptoms were decreased.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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