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The association between obesity and irritable bowel syndrome among a sample of patients attending the primary health care centers in Erbil city

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Abstract

Background: Irritable bowel syndrome and obesity are two prevalent conditions in our community which may be associated with each other according to some literature. Both have significant impact on the community.

Objective: To find the prevalence of irritable bowel syndrome, its association with general and central obesity, as well as to find its sociodemographic characteristics, and effect of some personal health habits on it.

Patients and Methods: In this cross-sectional study, a sample of 248 subjects, 105 males and 143 females, who attended two primary health care centers was taken (included healthy looking subjects and patients with irritable bowel syndrome according to Rome IV criteria). Subjects were aged between 18-65 years. Sociodemographic characteristics, personal health habits, central obesity index and body mass index also recorded in the survey.

Results: Prevalence of irritable bowel syndrome was 33.5%, male to female ratio was 0.73:1. No significant association was found between irritable bowel syndrome and general or central obesity. Bad sleep pattern was found to have a significant association with the disorder.

Conclusion: The study do not find significant association between obesity and irritable bowel syndrome.

Keywords: Irritable bowel syndrome, central obesity, Rome IV criteria

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Introduction

Obesity and irritable bowel syndrome (IBS) are prevalent conditions among our population causing significant morbidity in the affected individuals. However, it is not clear whether obesity is associated with IBS or not. Debates regarding this issue is ongoing[1].There are several studies regarding obesity as a risk factor for many gastrointestinal symptoms [2]. Many studies show that an excess of fat often correlates with an increased morbidity and risk for diseases such as hyperlipidemia, hypertension, and diabetes mellitus, whereas the distribution effect of visceral and subcutaneous abdominal fat on the risk of IBS is not clear yet [2]. Ongoing studies had

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inconsistent conclusions. An example of a recent negative study, Oijen et al found no association between functional gastrointestinal complaints and body mass index (BMI) [3]. The prevalence of obesity is increasing worldwide [4] as a major health problem. Although the role of obesity in gastrointestinal symptoms is not clear, it is possible that gastrointestinal diseases and obesity have more in common than only high population prevalence rates. Functional gastrointestinal diseases are believed to be due to an inflammatory insult to the gastrointestinal system that modifies visceral sensitivity or motility, therefore obesity may increase the risk of functional gastrointestinal disorders due to the release of proinflammatory cytokines. Data indicate that obesity is related to various gastrointestinal symptoms, many of which overlap with functional gastrointestinal disorders such as dyspepsia or IBS [4].

Irritable bowel syndrome is a common condition of the large bowel and one of the diseases that may become worse by stress. Other than that, age and sex are also factors affecting the IBS and it is more prevalent in younger females. [5] In addition, the data show that there are various prevalence rates in different communities [6].

According to some literature, academic level and family income is associated with IBS [5]. On the other hand, some other studied parameters do not have significant association with IBS, for instance smoking and marital status [5]. Sleep could affect IBS symptoms as it is related to stress level, which in turn, stress worsens IBS symptoms.

The aim of the present study is to identify the association of irritable bowel syndrome and obesity as well as its association with sociodemographic characteristics and other personal health habits.

Patients and Methods

This cross- sectional prospective study was carried out between October 2021 to January 2022. A convenience sample of 248 subjects (105 males and 143 females) was taken for those attended two primary health care centers in Erbil city, namely Brayati and Shadi health care centers. These subjects attended either for vaccination or for other health issues not related to gastrointestinal complaints. They were aged between 18-65 years. The data collection started by direct interview. A verbal consent taken from the subjects and the study had gained the approval of ethics committee of Kurdistan Higher Council of Medical Specialties. A specific questionnaire was made for that purpose which was composed of 6 parts. Part one composed of sociodemographic characteristics including age, gender, marital status, occupation and education. The second part was personal health habits including smoking cigarettes, alcohol use and sleep pattern, followed by the part of IBS Rome IV criteria inclusion questions, then some exclusion criteria, after that, questions regarding calculation of socioeconomic state index for Iraq [7]. The last part was for anthropometric measurements including body mass index (BMI), and waist-height ratio [8].

Pregnant females and patients with evidence of organic gastrointestinal disease were excluded from the study by some exclusion criteria like:

1. Past history of gastrointestinal surgery.
2. Evidence of anemia.
7. Repeated vomiting

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4. Loss of weight.
5. Melena or blood in stool.
6. Age of onset of symptoms above 50 years of age.
7. Abdominal mass or rigidity
8. Organo-megally.
9. Jaundice

The sample included both patients with IBS (83 subjects), and others being free from the disease (165 subjects). IBS patients were chosen according to Rome IV criteria as it is shown below:

Patients with evidence of pain in abdomen, started more than 6 months, in the last 3 months recurring at least one time per week, and two or more of the following:

1.Pain related to defecation.
2.Associated with change in frequency of defecation.
3.Associated with change in form of stool. [9].

All the subtypes of IBS, (diarrhea predominant, constipation predominant and mixed or un-subtyped) are studied collectively without demarcation in the sample.

The weight, height, and waist circumference (in the point of highest point of iliac crest) of all subjects were measured in a standard way and recorded. BMI is measured by dividing the height in meter by the square of weight in kilogram. The subjects were classified into normal weight (BMI<25), overweight (BMI 25-29.9) and obese (BMI>30). In addition, the waist circumference is divided by the height to find the central obesity index, and subjects with waist to height ratio of more than 0.5 were regarded as having central obesity [8].

Socioeconomic state was estimated according to socioeconomic state index for Iraq, and the subjects were divided into low, medium and high socioeconomic state groups [7].

Personal health habits which include smoking pattern, sleep pattern, alcohol use, were also included in the assessment.

The sample is categorized into IBS patients and non-IBS patients and studied with their other characteristics.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 25). Chi square test of association was used to compare proportions. Fisher's exact test was used when the expected frequency (value) was less than 5 of more than 20% of the cells of the table. Student's t test of two independent samples (unpaired t test) was used to compare means of two samples. A p value of ≤ 0.05 was considered as statistically significant.

Results

The total number of the studied sample was 248. The mean age (± SD) was 36.5 ± 12 years. The median was 34.5 years, ranging from 18 to 62 years. The male: female ratio was 0.73: 1. Figure 1 showed that the prevalence of the irritable bowel syndrome (IBS) which was 33.5%.

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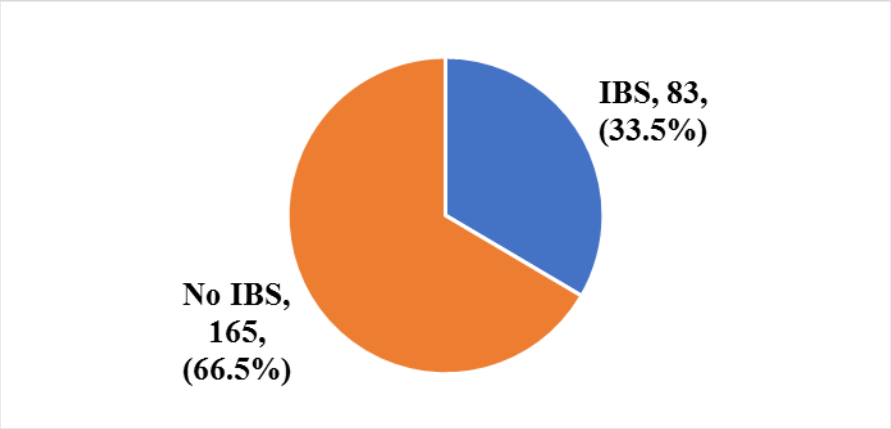

Figure (1); Percentage and prevalence of irritable bowel syndrome (IBS) patients (all subtypes) in the whole sample

No significant association was detected between the prevalence of IBS with BMI (p = 0.319), and waist/height ratio (p = 0.980), as presented in Table (1).

Table (1): Prevalence of IBS by BMI and waist/height ratio

		IBS	No IBS	
	N	No. (%)	No. (%)	P
Body mass index (Kg/m^2)				
< 25	99	31 (31.3)	68 (68.7)	
25-29.9	101	39 (38.6)	62 (61.4)	
≥ 30	48	13 (27.1)	35 (72.9)	0.319*
Mean (SD)		26.47 (5.19)	26.33 (4.77)	0.836†
Waist/height ratio				
Normal (≤ 0.5)	60	20 (33.3)	40 (66.7)	
High (> 0.5)	188	63 (33.5)	125 (66.5)	0.980*
Mean (SD)		0.57 (0.08)	0.56 (0.08)	0.573†
Total	248	83 (33.5)	165 (66.5)	

*By Chi square test. **By unpaired t test

No significant association was detected between age (p = 0.463), marital status (p = 0.944), occupation (p = 0.091), and socioeconomic status (p = 0.716) and the prevalence of IBS. The prevalence of IBS was 44.8% among females compared with 18.1% among males (p < 0.001). It is evident in Table (2) that there was significant association between the prevalence of IBS and the educational level (p = 0.021) but this association was not consistent throughout the different categories of education, as the prevalence of IBS was high among the illiterate (40.7%), then decreased to 28.6% among those with intermediate school, and then increased to 47.4% in the high school category, and the least rate was 5.9% among those with PhD.

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Table (2): Association between IBS prevalence with sociodemographic characteristics

		IBS	No IBS	
	N	No. (%)	No. (%)	P
Age				
< 30	78	30 (38.5)	48 (61.5)	
30-39	68	22 (32.4)	46 (67.6)	
40-49	64	22 (34.4)	42 (65.6)	
≥ 50	38	9 (23.7)	29 (76.3)	0.463**
Gender				
Male	105	19 (18.1)	86 (81.9)	
Female	143	64 (44.8)	79 (55.2)	< 0.001**
Marital status				
Single	71	24 (33.8)	47 (66.2)	
Married	177	59 (33.3)	118 (66.7)	0.944**
Educational level				
Illiterate	27	11 (40.7)	16 (59.3)	
Primary	23	9 (39.1)	14 (60.9)	
Intermediate	14	4 (28.6)	10 (71.4)	
High school	38	18 (47.4)	20 (52.6)	
Institute	28	8 (28.6)	20 (71.4)	
College	80	30 (37.5)	50 (62.5)	
Master	21	2 (9.5)	19 (90.5)	
PhD	17	1 (5.9)	16 (94.1)	0.021**
Occupation				
High rank	85	27 (31.8)	58 (68.2)	
Non-manual worker	58	16 (27.6)	42 (72.4)	
Unskilled manual worker	8	0 (0.0)	8 (100.0)	
Student	46	20 (43.5)	26 (56.5)	
Housewife	49	20 (40.8)	29 (59.2)	
Unemployed	2	0 (0.0)	2 (100.0)	0.091*
Socioeconomic status				
Low	48	18 (37.5)	30 (62.5)	
Medium	112	38 (33.9)	74 (66.1)	
High	88	27 (30.7)	61 (69.3)	0.716**
Total	248	83 (33.5)	165 (66.5)	

*By Fisher's exact test. **By Chi square test

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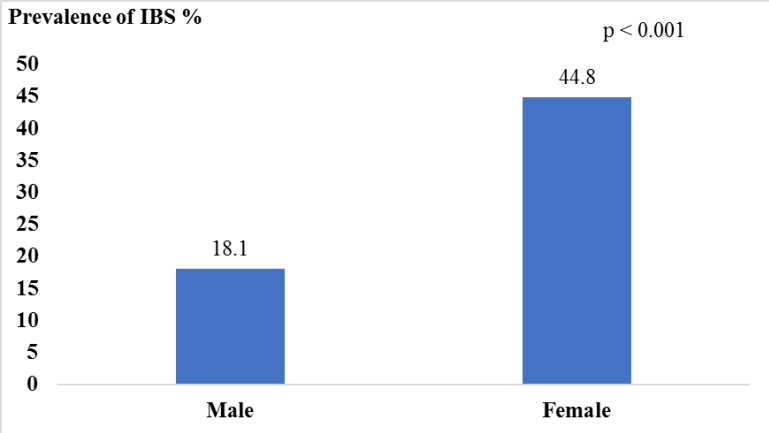

Figure (2): Prevalence of IBS by gende

Table (3) showed that there was no significant association of the prevalence of IBS with smoking (p = 0.094) and drinking alcohol (p = 0.183), but it is evident that the prevalence of IBS was 45.8% among those with bad sleep pattern which was significantly (p = 0.004) higher than the rate among those with regular night and daytime refreshing sleep (27.3%).

Table (3): Association between IBS prevalence with personal health habits

		IBS	No IBS	
	N	**No. (%)**	**No. (%)**	**P**
Smoking				
Non-smoker	206	75 (36.4)	131 (63.6)	
Ex-smoker	22	4 (18.2)	18 (81.8)	
Smoker	20	4 (20.0)	16 (80.0)	0.094**
Alcohol				
Not at all	242	83 (34.3)	159 (65.7)	
Occasional	6	0 (0.0)	6 (100.0)	0.183*
Sleep				
Regular night and daytime refreshing sleep	165	45 (27.3)	120 (72.7)	
Bad sleep pattern	83	38 (45.8)	45 (54.2)	0.004**
Total	248	83 (33.5)	165 (66.5)	

*By Fisher's exact test. **By Chi square test

Discussion

The prevalence of IBS in the present study (33.5%) was more than that reported in other populations [10]. But in some others, like in Pakistan showed a prev.alence as high as our sample (33.2 %) [6] This may be due to the nutritional habit differences between different communities and also life stresses may play its role.

Both obesity and IBS have significant burden on the society and health care system. While many researchers have found an association between obesity and IBS, some others did not. The present study did not find association between general (known by BMI) or central obesity with IBS. Many studies found that obesity is positively related to diarrhea-predominant IBS, but not IBS in

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general [11].On the other hand, being overweight was more prevalent among people who have functional constipation in Iranian population [4].Although the IBS etiology is not clear, some investigators claimed that altered intestinal motility, altered gut flora or diet may be involved. Animal studies show that body habitus is related to altered lower gastrointestinal tract motility; however, the data are inconsistent [1].

Although it is well documented that obesity is related to gastroesophageal reflux disease, it remains unclear whether obesity is a risk factor for com¬mon functional gastrointestinal disorders, including dyspepsia and IBS. Oijen et al found no association between IBS and BMI, but as expected, they found a positive relation between obesity and gastroesophageal reflux disease [3].

The present study result is supported by another cross-sectional study performed by Delgado-Aros *et al*., who studied association between IBS and obesity and found no statistically significant association [3].

Talley *et al*. did another two cross-sectional studies investigating the relation between bowel symptoms and BMI. The first study was a sample of community-based subjects in Aus¬tralia., this study showed a positive correlation between diarrhea and increased BMI, but it failed to show a relationship between BMI and lower abdominal pain, bloating or constipation. The other study done by Talley et al. was a cohort survey of (twenty-six) year old New Zealanders. By using an abbreviated version of the intestinal symptom ques¬tionnaire, the researchers found a significant relationship between obesity and different bowel symptoms, such as nausea, abdominal pain, and diarrhea. However, this study also found no association between IBS and obesity [3].

In contrast to the present study Bilal Natiq had found a positive relation between central obesity and IBS after performing a case control study [12].

Braun and his colleagues found that BMI was positively and significantly correlated with somatization but not IBS symptom severity or emotional distress [13].

In fact, in patients with IBS, it has been shown that, lipids, raise intestinal perception of gut stimuli, by their ability to sensitize gut mechanoreceptors. Fat can also affect the perception of upper gastrointestinal sensations, as it has been shown in patients with functional dyspepsia compared to healthy subjects, that infusion of lipid into the duodenum causes greater symptoms, such as, epigastric fullness, nausea and bloating. [14]. So dietary factors in obese patients may play role in presenting symptoms of IBS.

Therapies with clinical evidence for IBS are limited. If IBS symptoms were associated with obesity, gastroenterologists should emphasize weight loss as a potential therapeutic modality for IBS. But the present study did not support such interventions [1] Obesity and IBS may be linked; however, a true association and its underlying mechanisms remain to be more clarified [1].

As far as the socioeconomic characteristics, the most consistent association in the present study was the gender, being obviously more in females which was also documented in previous studies. For instance, in a study conducted in Iran male to female ratio was 0.43:1 [15]. Another example, in a study

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done on Lebanese people, females were 1.67 times more likely to have IBS [10].

The socioeconomic state was not associated with IBS, this is opposed by the results of Al-Bukhari et al whose sample was composed only of students [5].

Regarding the educational level, there was a significant, but inconsistent association with IBS, as the prevalence of IBS was high among the illiterate (40.7%), then decreased to 28.6% among those with intermediate school, and then increased to 47.4% in the high school category, and the least rate was 5.9% among those with PhD.

Among the personal health habits, in the present study, bad sleep pattern was associated with IBS, as it is obvious that is related to the life stress level, which is positively related to IBS. Patel et al had found similar association between bad sleep pattern and IBS [16].

In the present study, there was no significant association between IBS and smoking pattern which is supported also by Al-Bukhari *et al.* [5].

As it was found previously by Reding et al, alcohol intake had no significant association with IBS. Reding et al only found worsening of IBS symptoms the day after binge drinking [17].There were only 6 occasional drinkers in our sample so another study should be done with more alcohol drinkers in the sample to clarify this issue.

Acknowledgement

We want to acknowledge the managers of Brayati and Shadi health care centers for their support.

Conclusions

There was no significant association between IBS and obesity. The disease is more common in females and it is worsened by stress. Furthermore, Smoking and alcohol are not associated with IBS. Bad sleep pattern is associated with IBS.

Recommendations

We recommend doing the study with a larger sample size so as to clarify whether weight reduction is an effective method of improving IBS symptoms.

Source of funding: The current study was funded by our charges with no any other funding sources elsewhere.

Ethical clearance: Consents are taken verbally from all the subjects prior to participation. And the research had gained the ethical approval of ethics committee of Kurdistan Higher Council of Medical Specialties.

Conflict of interest: Nill

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علاقة السمنة بمتلازمة القولون العصبي في نموذج من مرضى المراكز الصحية في مدينة أربيل

زانا مصطفى محمود [١] ، د. كاروان حويز سليمان [٢]

الملخص

خلفية الدراسة: متلازمة القولون العصبي والسمنة حالتان سائدتان في مجتمعنا قد يرتبطان ببعضهما البعض حسب بعض البحوث. كلاهما له تأثير كبير على المجتمع.

اهداف الدراسة: لمعرفة مدى انتشار متلازمة القولون العصبي ، وارتباطها بالسمنة العامة والمركزية ، وإيجاد خصائصها الاجتماعية والديموغرافية ، وتأثير بعض العادات الصحية الشخصية عليها.

المرضى والطرائق: تم أخذ عينة من ٢٤٨ شخصًا ، ١٠٥ ذكور و ١٤٣ إناث ، ممن حضروا مركزين للرعاية الصحية الأولية (بما في ذلك الأشخاص الذين يتمتعون بصحة جيدة والمرضى الذين يعانون من متلازمة القولون العصبي وفقًا لمعايير روما الرابعة). تتراوح أعمار المشتركين بين ١٨ و ٦٥ عامًا. كما تم تسجيل الخصائص الاجتماعية الديموغرافية والعادات الصحية الشخصية ومؤشر السمنة المركزي ومؤشر كتلة الجسم.

النتائج: بلغ معدل انتشار متلازمة القولون العصبي ٣٣,٥% ونسبة الذكور إلى الإناث ١:٠,٧٣ لم يتم العثور على ارتباط كبير بين متلازمة القولون العصبي والسمنة العامة أو المركزية. وجد أن نمط النوم السيئ له علاقة كبيرة بالاضطراب.

الاستنتاجات: لم تجد الدراسة علاقة ذات دلالة إحصائية بين السمنة ومتلازمة القولون العصبي.

الكلمات المفتاحية: متلازمة القولون العصبي ، السمنة المركزية ، معايير روما الرابعة

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تاريخ قبول البحث: ٢٧ آذار ٢٠٢٢

[٢،١] كلية الطب - جامعة هولير الطبية - اربيل- العراق