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Diagnosis of irritable bowel syndrome by Rome IV among diabetic and non-diabetic patients attending primary health care centers in Mecca

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Abstract
Background: In diagnosis of IBS we use Rome IV criteria, the prevalence of IBS depending on that criteria are between 10% and 25% of all population. In this study we aim to determine the prevalence of Irritable Bowel Syndrome among diabetic and non-diabetic to estimate the risk of developing diabetes among patients with IBS later life.
Material and Methods: This was a retrospective Case control study of patients between 30 and 65 years diabetic and non-diabetic in primary health centers in Mecca city in 2017.
Results: The total patients enrolled in the study was (n=198) showed that 29.4% of total male patients had IBS and, 31.5% of total female patients had IBS. 33 diabetic patient had IBS which was 33.3% of diabetic patient and 28 participant of non-diabetic had IBS which was 28.3% of non-diabetic which considered not significant.
Conclusion: The study indicates that there is no relation between IBS and DM, but exercise could decrease the risk of developing IBS.

Keywords: irritable bowel syndrome (IBS), health-related quality of life (HRQOL), Rome IV criteria

1. Introduction
Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder which affects the colon. IBS is a chronic condition which need a long-term management. The signs and symptom of the disease varies from person to another, and most of the patients come with abdominal bloating, pain, bowel gases, Mucus in the stool, diarrhea or constipation and may be alternating of both [1]. In the diagnosis of IBS according to Rome IV criteria, the patients must have had recurrent abdominal pain at least once a week in the last 3 months, which associated with 2 or more of the following:

- Related to defecation.
- Associated with a change in frequency of stool.
- Associated with a change in the stool form [2]

The prevalence of IBS depending on the diagnostic criteria is between 10% and 25% of the population globally [3]. The most significant complication of IBS is impact on Health-related quality of life (HRQOL), HRQOL is impaired in all patients with IBS but the degree is different according to the severity of symptoms [1, 4]. Patients suffer of IBS visit the clinics more frequently, use more tests, consume more medications, have lower work performance, are frequent hospitalized and consume more direct costs than patients without IBS [5]. The prevalence of IBS was estimated in 2010 in Saudi Arabia, Makkah city and IBS were diagnosed among 26.7% of the male participants based in Rome III criteria [7]. Another study was done in 2004 in UK estimated the community-based prevalence of IBS by Rome II and it was 10.5% (14.0% of women and 6.6% of men) [8]. In most population IBS affect female more than male. Meanwhile, a study on difference in prevalence of just over 5% between the sexes, with a prevalence in female of 14.0% compared with 8.9% in male, while 50% of patients with IBS diagnosed before the age of 35 years, and prevalence is lower than 25% in those aged over 50 years [3].
There is no research among the population that estimate the prevalence of IBS among diabetic patients in compare with non-diabetic patients. In this study we aim to determine the prevalence of Irritable bowel syndrome among diabetic and non-diabetic patients in primary health care centers in Mecca city and estimate the risk of developing diabetes among patients with irritable bowel syndrome later life.

2. Methods
2.1 Ethics
The study was approved by the committee of Bio-medical ethics in Umm Al-Qura University UQU in Mecca. All participants gave written informed consent before conducting the questionnaire, and all data were kept anonymously for the protection of the patient's privacy.

2.2 Study design and participants
A retrospective Case control study was conducted among diabetic and non-diabetic patients in primary health care centers in Mecca city in 2017. The Data collection period was set between 19th Jan to 5th of Feb 2017. The sample was recruited from 198 patients, 99 new cases and 99 control attending primary health cares. Three primary health care centers were distributed in three different regions. Subjects were allocated to study groups using non-randomization performed by using alternated days of the week. Both sexes

were included in the study as well as, ages between 30 and 65 years and type 2 DM were included in the study. While, Type1 DM and Refused consent were excluded from the study.

2.3 Data collection and Variables

Enclosed questionnaire was provided to the patients and filled by data collectors by conduction a short personal interview to allow the diagnose of Irritable bowel syndrome by Rome Criteria and were asked about the past history of IBS among diabetic and non-diabetic patients. The variables were: Sociodemographic characteristic, past history of IBS, Rome IV diagnostic questions [6] and risk factors of diabetes. The questionnaire has 14 questions related to these variables:

1. Sociodemographic characteristic: gender, age (30-65 years).
2. Past history of IBS: did the patient have irritable bowel syndrome? (yes or no), since when diagnosed? (less than 5 years or more than 5 years), did the patient diagnosed by a doctor? (yes or no), did the patient on treatment for IBS? (yes or no), if diabetic: when did the patient have IBS? (Before or after diagnosing of DM or don't know).
3. Rome IV diagnostic questions: In the last 3 months, how often did you have pain anywhere in your abdomen? (Never, less than one day a month, one day a month, two to three day a month, once a week Two to three day a week, most days, every day, Multiple times per day or all the time). How often did this pain in patient's abdomen happen close in time to a bowel movement just before, during or after? (percent of times with pain from 0% to 100%). How often did patient's stool become softer than usual or harder than usual when patients had this pain? (percent of times with pain from 0% to 100%). How often did patient's stool become either more frequent than usual or less frequent than usual when you had this pain? (percent of times with pain from 0% to 100%). Has it been 6 months or longer since patient started having this pain? (yes or no).
4. Risk factors of diabetes: if the patient had family history of diabetes, lack of exercise and overweight (yes or no).

The Dependent factor was Diabetes Mellitus, independent factor was Irritable bowel syndrome. Confounding variable: risk factors of diabetes mellitus Proposed diagnostic criteria: Rome IV criteria, developed by The Rome Foundation Organization and used for diagnosis of functional gastrointestinal disorders (FGIDs).

3. Result

Statistical analysis was performed using the SPSS software package, qualitative variables were submitted as percent and considering the correlation between the case and control groups, the prevalence of Irritable bowel syndrome in diabetic and non-diabetic patients was calculated by using chi-square test (Table 3). We aimed to determine the prevalence of Irritable bowel syndrome among diabetic and non-diabetic patients and estimate the risk of developing diabetes among patients with irritable bowel syndrome later in life.

The total patients enrolled in the study was (n=198), 130 females (65.7%) and 68 males (34.3%) with a mean age of 48 years. Our study showed that 29.4% of total male patients had IBS and, 31.5% of total female patients had IBS. 61 out of 198 had IBS (30.8%) according to Rome IV criteria. 99 (50%) of the participant were diabetic and 99 (50%) were non-diabetic. The study showed that 33 diabetic participant had IBS which was 33.3% of total diabetic patient and 28 participant of non-diabetic had IBS which was 28.3% of total non-diabetic, the P-value were 0.53 and considered not significant. 20 (60.6%) of diabetic patient had IBS before the diagnosis of DM, 12 (36.4%) of diabetic had the diagnosis of IBS after the diagnosis of DM and 1 (3%) of diabetic patient don't when diagnosed with IBS. Regarding risk factors of DM which were family history of DM, overweight and sedentary lifestyle, 120 (60.6%) patients from total patients had family history of DM and (65.6%) of them had IBS. 109 (55.1%) of total patients were overweight and (57.4%) of them had IBS. 119 (60.1%) of total patients don't do exercises and (73.8%) of them have IBS Which is only one risk showed significant P value (0.014) (Table 2, 3).

Table 1: DM * IBS Crosstabulation

			IBS		Total
			Yes	No	
DM	Diabetic	Count	33	66	99
		% within Diabetic or not	33.3%	66.7%	100.0%
		% of Total	16.7%	33.3%	50.0%
	Non-Diabetic	Count	28	71	99
		% within Diabetic or not	28.3%	71.7%	100.0%
		% of Total	14.1%	35.9%	50.0%

Table 2: IBS * Exercise Crosstab

			Exercise		Total
			Yes	No	
history of IBS	Yes	Count	16	45	61
		% within history of IBS	26.2%	73.8%	100.0%
		% of Total	8.1%	22.7%	30.8%
	No	Count	63	74	137
		% within history of IBS	46.0%	54.0%	100.0%
		% of Total	31.8%	37.4%	69.2%

Table 3: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.870[a]	1	.009		
Continuity Correction	6.070	1	.014		

4. Discussion

The study showed that 33.3% of diabetic participants had IBS, and 28.3% of non-diabetic participants had IBS, the P-value were 0.53 and considered not significant.

In which, 60.6% of the diabetic patients had IBS before the diagnosis of DM, while 36.4% of the diabetic participants had the diagnosis of IBS after the diagnosis of DM and 3% of the diabetic patients do not remember when were diagnosed with IBS. The mean age of IBS is 48 years.

Prevalence of IBS is 30.8% of total samples, where 29.4% were male and 31.5% were female. There is a slightly increase in the prevalence of IBS among male patients, comparing to a study found in 2010, as the prevalence of IBS in Al Iskan primary health care was 26.7% estimated in Saudi Arabia,

Makkah city of adult male participants. This prevalence difference in both studies could be due to the usage of different criteria as they used Rome III and was held in one primary health care center, while this study used Rome IV and includes three different primary health care centers.

People who have a sedentary lifestyle are at high risk of developing IBS. It has been found that sedentary lifestyle is the only significant risk factor (P= 0.014), as 60.1% of the sample do not exercise and 73.8% of them have IBS. Unfortunately, there are no researches or data supporting that sedentary lifestyle can increase the risk of developing IBS. A study held at Bangabandhu Sheikh Mujib Medical University in 2013, showed that symptoms of IBS were decreased in patients who do moderate physical exercises due to shifting of sympathovagal balance from sympathetic predominance to parasympathetic predominance [9].

5. Conclusion

The study indicates that there is no relation between the diagnosis of Irritable bowel syndrome and DM, but physical exercise could decrease the risk of developing IBS.

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