Original Article

The Relationship between Fibromyalgia Syndrome and Body Mass Index

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Summary:

Background: Fibromyalgia syndrome (FMS) is a common rheumatologic syndrome with multiple systemic manifestations & associated with many diseases. The aim of the study is to assess the relationship between FMS and BMI (Body mass index) in a sample of Iraqi patients.

Patients and Methods: Fifty patients with FMS, 46 (92%) females and 4 (8%) males; their mean age (47.44), and 25 healthy control individuals were studied; 13 (52%) are females and 12 (48%) are males, their mean ages (41.4) years. All FMS features and criteria are studied for patients and control, patients with secondary FMS was excluded. Body mass index (BMI) is determined for both groups.

Results: The ratio between female and male was 11:1. There was a statistical significant relation between patient with FMS and BMI (P-value= 0.001) but there was no statistical significant relation in age score between patient with FMS and BMI (P-value= 0.531). All variables which are sleep disturbance, headache, fatigue, numbness, stressful events, depression and irritable bowel symptoms have statistical significant difference between FMS patients and controls (P-value < 0.05) except anxiety which has no statistical significant relation (P-value= 0.123).The relationship between BMI and the variables in the FMS patients show no statistical significant relation (P-value > 0.05) except sleep disturbance which show significant relation (P-value= 0.045).

Conclusions: There is a statistically significant relationship between FMS and increased BMI.

Key words: Fibromyalgia syndrome, Body mass index

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Introduction:

Fibromyalgia (FM) is a debilitating and frustrating syndrome characterized by a chronic widespread pain and tenderness with prevalence rate of 4.9% in the general population (1). Its pathogenesis has been linked to genetic &environmental factors; abnormal pain &sensory processing; hypothalamic-pituitary &autonomic dysfunction; and psychological &behavioral factors (2). The American College of Rheumatology 1990 Criteria for Classification of FMS were applied for diagnosis (3). Body mass index (BMI) is the most useful measure of obesity (4) which is the most common nutritional disorder in affluent societies (5). World wide there is an obesity epidemic. Greater number of men and women have become obese during the past decade (6) & overweight is associated with a lot of medical problems. (7). The relationship between obesity and nonarticular tenderness has scarcely been studied, though in National Institute of Health conference in 1994 on fibromyalgia, it was recommended that this issue should be studied (8). Data on the relationship between body mass index (BMI) and chronic pain are also limited (9). The aim of the study is to determine the possible relationship between BMI and FMS & to assess if the body weight changes are a risk factor for FMS.

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Patients and method:

A cross-sectional study was carried out at the Baghdad Teaching Hospital / Rheumatology Unit from January 2008 till May 2008. Fifty Iraqi patients with fibromyalgia were diagnosed on base of The American College of Rheumatology (ACR) 1990 Criteria for the classification of FMS(3). Another 25 healthy individuals matched for age and sex were collected from relatives and accompanying persons of patients attending the Baghdad Teaching Hospital and to Rheumatology Unit, were studied as a control group. Full history & complete physical examination were done for both groups. Patients with primary fibromyalgia only were included in the study. BMI was calculated as weight in kilogram divided by square of the height in meters, the world health organization (WHO) classification criteria were used to identify normal weight BMI (18.5-24.9) and over weight ($\geq$25.00 Kg/m^2) (10). Blood test such as hemoglobin, total white blood cell count and ESR was determined to exclude inflammatory causes of pain and to exclude secondary FMS.

A signed consent was taken from all individuals studied. Ethical approval was obtained from the Ethics Committee of Baghdad University, College of Medicine, and Medical Department.

Statistical analysis was done using statistical package for social science (SPSS 14). Association between categorical variables was measured by Chi-Square test and Fisher's exact test if indicated,

difference between continuous variables measured by t-test. P-value <0.05 was considered significant.

Results:

Fifty patients were included in this study, of them 46(92%) are females and 4(8%) are males. Their mean age is (48.5) and (40.8) years old respectively as shown in Table 1.

The patients' female: male ratio was 11:1 compared with controls 1:1, this mean that most of our patients are females. The mean for BMI in FMS patients is (31.58) compared with control, which is (28.48). Twenty-six (52%) patients of total FMS are obese and 20 (40%) patients are over weight. While only 4 (8%) patients are normal compared with control which has 9 (36%) patients obese, 3 (12%) patients are over weight and 12 (48%) patients are normal (Table 2).

There is a statistical significant difference between clinical characteristics of FMS & controls (BMI score, sleep disturbances, headache, fatigue, numbness, stressful events, depression, & irritable bowel) where (P-value< 0.05) as shown in Table 3.

There is no statistical significant relation between clinical characteristics of patients and controls according to the age score & anxiety (P-value >0.05) as shown in Table 3.

Comparison between BMI and patients' studied variables revealed only statistical significant association between BMI & sleep disturbances (P-value=0.045) as in Table 4.

Table-1: Age and sex comparison between patient and control

Parameters	FMS	Control
Mean age (years)	47.44	41.4
Female	48.5	42.38
Male	40.8	39.25
Sex ratio Female: Male	11:1	1:1
BMI mean	31.58	28.48

FMS, fibromyalgia syndrome patients; BMI, body mass index

Table2: Distribution of the study patients and controls by WHO classification of BMI

FMS	Total No. (%)	Underwt No. (%)	Normal No. (%)	Over wt. No. (%)	Obese No. (%)
Total	50 (100)	--	4 (8)	20 (40)	26 (52)
Male	4 (8)	--	1 (2)	2 (4)	1 (2)
Female	46 (92)	--	3 (6)	18 (36)	25 (50)
Control					
Total	25 (100)	1 (4)	12 (48)	3 (12)	9 (36)
Male	12 (48)	--	6 (24)	2 (8)	4 (16)
Female	13 (52)	1 (4)	6 (24)	1 (4)	5 (20)

FMS, fibromyalgia syndrome patients; wt, weight

Table3: Comparison between clinical characteristics of FMS and controls

Variable	Controls No. (%)	Patients No. (%)	P. value
Age score <50 ≥50	14 (56) 11 (44)	29 (58) 21 (42)	0.531
BMI score <25 ≥25	13 (52) 12(48)	4 (8) 46 (92)	0.0001 *
Sleep disturbances			
0	21 (84)	5 (10)	0.0001 *
1	4 (16)	45 (90)	
Headache 0	21 (84)	3 (6)	0.0001 *
1	4 (16)	47 (94)	
Fatigue 0	24 (96)	----	0.0001 *
1	1 (4)	50 (100)	
Numbness 0	25 (100)	28 (56)	0.0001 *
1	----	22 (44)	
Stressful events 0	7 (28)	2 (4)	0.005 *
1	18 (72)	48 (96)	
Anxiety 0	25 (100)	45 (90)	0.123
1	-----	5 (10)	
Depression 0	25 (100)	39 (78)	0.008 *
1	-----	11 (22)	
Irritable bowel 0	23 (92)	9 (18)	0.0001 *
1	2 (8)	41 (82)	

0 = absent; 1 = present; * = significant (p-value <0.05)

Table4: Comparison between BMI and studied variables

Variables	BMI < 25 No. (%)	BMI ≥ 25 No. (%)	P. value
Age score <50	2 (50)	27 (58.7)	0.564
≥50	2 (50)	19 (41.3)	
Sleep disturbances			
0	2 (50)	3 (6.5)	0.045 *
1	2 (50)	43 (93.5)	
Headache 0	1 (25)	2 (4.3)	0.226
1	3 (75)	44 (95.7)	
Fatigue 0	---	---	-----
1	4 (100)	46 (100)	
Numbness 0	3 (75)	25 (54.3)	0.402
1	1 (25)	21 (45.7)	
Stressful events 0	---	2 (4.3)	0.845
1	4 (100)	44 (95.7)	
Anxiety 0	4 (100)	41 (89.1)	0.647
1	---	5 (10.9)	
Depression 0	4 (100)	35 (76.1)	0.357
1	---	11 (23.9)	
Irritable bowel 0	2 (50)	7 (15.2)	0.144
1	2 (50)	.39 (84.8)	

0 = absent; 1 = present; * = significant (p-value <0.05)

Discussion:

The present study demonstrates that our FMS patients are overweight.

In the present study, there was a statistical significant relation between BMI and FMS (P-value= 0.0001) since most of our patients are with BMI ≥ 25, which is likely due to physical inactivity. This agreed with Yunus, Arsalans, & Aldag study (11). In this study, we found that most patients are women, this may be due to the tendency of women to seek early medical advice regarding their disease, or may be because they are more vulnerable to stressful events and psychological trauma than men since our country exposed to a number of stressful

events in the last decade. This finding is in agreement with a study done by Haynes and Fauci (12) and another study done by Doherty, Lanyon, and Ralston (13). In the present study, there is a statistical significant relation in the clinical characteristics (sleep disturbances, headache, fatigue, numbness, stressful events depression and irritable bowel symptoms) between patients and controls (P-value <0.05), this finding supports evidence that such symptoms are strongly related to FMS (14). A part from these variables, anxiety is detected more commonly in FMS patients in comparison with controls but this difference does not reach a statistically significant difference (P-value= 0.123). In the recent study, there is a negative relation between BMI and studied variables except sleep disturbance which has a statistical significant relation (P-value= 0.045). This mean that people with high BMI (≥ 25) are more prone to sleep disturbance which possibly might be explained by sleep apnea syndrome because obese people have narrow air way so during sleep, breath pauses 100 time/night and some times for a minute, one study estimated that 18 milion American has sleep apnea syndrome, 80% of them are obese (15). In other research, they found that if the person has no sleep apnea, the day time sleeping is a morbid characteristic of obese patient. This day time sleeping in obese individuals appears to be related to circadian abnormality of sleep (16). It is not clear why obese subjects have higher pain sensitivity; it may result from local or general factors. It is possible that high subcutaneous fat results in higher pain sensitivity, and it may be hypothesized that there are more pain receptors in fat tissue. Furthermore, other types of pain such as visceral pain have been found increased in obesity.Gastrointestinal symptoms were found to be more intense in morbidly obese patients (17), and chronic abdominal wall pain was frequently associated with obesity (18).General factors that predispose obese subjects to higher sensitivity may be associated with deconditioning as often is seen in FMS patients. It is possible that the difference in pain sensitivity between obese and non obese subjects may be related to endogenous opiates, since they have been implicated as regulators of mood and pain (19). A number of limitations of the current study must be pointed out. We did not perform a detailed assessment of depression, anxiety, or coping among patients who developed tenderness and other symptoms of FMS. The relatively small size of the study sample must be noted. Despite these limitations, the recognition of the association between obesity and increased tenderness is important to physicians taking care of obese individuals and FMS patients. Symptoms of increased tenderness in these subjects may be misinterpreted by the physician unfamiliar with these associations as a part of an underlying disease. Furthermore, these observations are important for researches in the field of pain (20). We recommend including BMI in addition to gender and other factors in designing future studies that explore factors affecting tenderness to get better rehabilitation & management for FMS patients.

Conclusion:

There is a significant statistical relationship between FMS and increased BMI.

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