Original Article

Fibromyalgia Syndrome among Iraqi Patients with Knee Osteoarthritis

Ziad S. Al-Rawi* DPM
Faiq I. Gorial* CABM, FIBMS (Rheum&Med. Reh.)
Wafi H. Ali** DMR

Summary:

Back ground: Fibromyalgia syndrome (FMS) is a common chronic musculo-skeletal disorder resulting in chronic widespread pain impacting on quality life.

Objectives: To assess the relationship between FMS and knee osteoarthritis (KOA) and to evaluate the predictors of this relationship if present.

Patients and Methods: One hundred Iraqi KOA patients and 100 healthy controls were included in this cross-sectional study. Full history was taken and complete clinical examination was done for all patients. Baseline characteristics [age, sex, duration, body mass index (BMI), waist circumference, family history (Hx) of KOA, smoking history, and drug history.] were also documented. Laboratory analysis included complete blood count, erythrocyte sedimentation rate (ESR), thyroid stimulation hormone, serum calcium, serum alkaline phosphatase, serum phosphate, and anti-nuclear antibody were done for all patients. X-rays of both Knees was taken for patients and was graded according Kellgren and Lawrence scale. The American College of Rheumatology (ACR) criteria for classification and reporting osteoarthritis of the knees were applied on both groups. Individuals in both groups were assessed for FMS and the American College of Rheumatology 1990 Criteria for fibromyalgia were applied for both groups. Comparative statistics were done using Chi square test for categorical variables and students' independent 2 samples (t) test for continuous variables.

Results: FMS was present in 26 of 100(26%) KOA patients compared to 7(75%) of 100 of controls [odd ratio (OR)=4.6(95% CI(1.92-11.35),p=0.001]. Frequencies of associated features (headache, sleep disturbances, fatigue, depression, anxiety, and parasthesia) were significantly more in patients than that of controls (P<0.05). Longer duration of KOA, higher waist circumference, and positive family Hx of FMS were significant associates with FMS in the patient group (P<0.05). However no significant association was found with age, sex, BMI, grade of KOA, drugs taken marital status, and increased ESR.

Conclusions: FMS was significantly increased in Iraqi patients with KOA compared to controls. Longer disease duration of KOA, large waist circumference and family history of FMS were significant predictors.

Keywords: Knee osteoarthritis, fibromyalgia, Kellgren and Lawrence scale,osteoarthritis.

Fac Med Baghdad 2014; Vol.56, No.1
Received:Aug., 2013
Accepted Dec., 2013

Introduction:

Osteoarthritis is the most common form of joint disease in humans (1). It is characterized clinically by pain and functional limitations, radio graphically by osteophytes and joint space narrowing, and histopathologically by alteration in cartilage and subchondral bone integrity (2).

FMS is chronic non - inflammatory and non - autoimmune musculoskeletal disorder characterized primarily by diffuse musculoskeletal pain and sensitivity to mechanical stimulation at soft tissue tender points (3).

On literature review one study only was reported to show increased frequency of FMS in patients with OA (4). However, In Iraq, up to the best of our knowledge we could not find any available data about FMS in patients with knee OA or OA in general. The aims of this study were to assess prevalence of FMS in Iraqi patients with OA and to.

* *Medical Department , Baghdad University, College of Medicine, Rheumatology Unit.*
** *Dept. of Rheumatology and Rehabilitation, Baghdad Teaching Hospital, Medical City.*

Patients and methods:

evaluate the predictors for this relationship if present A cross-sectional study was conducted between October 2011 and May 2012 at the Rheumatology Unit, Department of Medicine in Baghdad Teaching Hospital.

A total of 100 patients with osteoarthritis of both knees (KOA) were diagnosed according to the American College of Rheumatology (ACR) Criteria (5) randomly selected and compared with 100 healthy individuals also randomly selected and taken from the accompanied relatives of other patients attending the Rheumatology Unit served as a control group and matched for age and sex of patient`s group

Informed consent was obtained from each participant included in this study according to the declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Baghdad University.

Patient were excluded from the study if they had other comorbid conditions like autoimmune disorders, neurological disorders, endocrine disorders, hepatitis C, malignancies, osteomalacia, and

inflammatory arthritis .

Data entry of patients and controls were performed using paper clinical research form through interview and questionnaires. Full history was taken from all individuals including : age ,sex, height, weight , body mass index (BMI) , waist circumference (WC), symptoms of pain > 1month, stiffness<30 minutes, and crepitus , family history of FMS , medications history (Hx) , smoking Hx , and complete clinical examination was done for individuals in both groups .

FMS was diagnosed according to American college of rheumatology (ACR) 1990 criteria for fibromyalgia. These criteria were applied on both patients and controls (6).

X-rays of both knees were taken for patients and controls and KOA was graded according to Kellgren and Lawrence scale for the patients group (7) .Waist circumference (WC) was measured at the midpoint between the right lower rib and the iliac crest at the end of expiration and body mass index(BMI) was calculated by the equation BMI= weight / height ^{2} for all patients .Blood sample was obtained for measurement of complete blood count (CBC),erythrocyte sedimentation rate(ESR), serum calcium, serum alkaline phosphatase, serum phosphorus, thyroid stimulating hormone (TSH),and antinuclear antibody(ANA) for all patients.

Statistical analysis was done using statistical package for social sciences software for windows version 20 (SPSS 20). Descriptive statistics for baseline characteristics were presented as mean ± SD for age, BMI, waist circumference and disease duration (for patients' group), while other variables were presented as frequencies and percentages. Chi square was used to assess the significance of difference between cases and controls groups regarding the categorical variables. students' independent 2 samples (t) test was used to assess the significance of differences between studied groups in continuous variables. P value ≤ 0.05 was considered significant.

Results:

One hundred patients with Knee OA, 78 (78%) females and 22 (22%) males, their mean age 52.8 ± 7.7 years, and 100 healthy control group, 72 (72%) females, and 28 (28%) males, their mean age was 53.9 ± 6.5 years were included in this study. The age and sex of patients and controls were shown in Table 1 with no statistical difference between both groups (p = 0.327 and 0.242 respectively).

Fibromyalgia syndrome (FMS) was reported in 26 (26%) patients with Knee OA compared to 7 (7%) controls, the differences were statistically significant (p=0.001, in other words, patients were about 3.7 folds more likely to have FMS than controls [odds ratio (OR) = 3.714 (95% CI (1.690 – 8.161), P = 0.001] as shown in Table 2.

In Table 3, Frequencies of associated symptoms were significantly more prevalent among patients than those of controls, headache was 2.6 folds more frequent among patients than controls (p=0.012), sleep disturbances were 3.5 folds (p=0.003), Fatigue 2.7 folds (p=0.048), depression 3.9 folds(p=0.005), anxiety 3.4 folds (p=0.006), and parasthesia 3.4 folds(p=0.006) more frequent among patients than those of controls. However, IBS was about equally frequent in both groups (odds ratio= 1.1, P >0.05).

Finally, the association between presence of FMS and the baseline characteristics of the 100 patients with knee OA was shown in Table 4. KOA patients with FMS showed longer disease duration and larger waist circumference compared to patients without FMS (P<0.05). Also, there was highly significant association between family history of FMS in patients with KOA and FMS presence (P=0.0001) but no significant association had been found with the other characteristics (P>0.05).

Table1: Demographic characteristics of 100 Knee OA patients and 100 controls.

	Knee OA	Control	
Characteristics	**N = 100 (100%)**	**N = 100 (100%)**	**P-value**
Age mean ± SD (year)	**52.8 ± 7.7**	**53.9 ± 6.5**	**0.242**
Sex			
Male, n (%)	**22 (22%)**	**28 (28%)**	**0.327**
Female, n (%)	**78 (78%)**	**72 (72%)**	

N; number, P; P value, %; percent, M; mean, SD; standard deviation, OA, osteoarthritis

Table2: prevalence of FMS among 100 Knee OA patients and 100 Controls

Fibromyalgia Syndrome	Knee OA n = 100	Control n = 100	OR (95%CI)	P-value
Present n (%)	**26(26%)**	**7(7%)**	**3.714 (1.690 – 8.161)**	**0.001****
Absent n (%)	**74(74%)**	**93(93%)**		

**p<0.01highly significant, OR, odd ratio; CI, confidence interval; OA, osteoarthritis; n, number

Table3: Frequencies of the associated symptoms among the study groups

Symptoms	Knee OA (n=100)	Controls (n =100)	Total	Odds ratio(95%CI)	P-value
Head ache n(%)	26(26%)	12(12%)	38	2.6(1.22 – 5.46)	0.012*
Sleep n(%) disturbance	26(26%)	9(9%)	34	3.5(1.57-8.1)	0.003**
Fatigue n(%)	17(17%)	7(7%)	24	2.7(1.1 -6.9)	0.048 *
Depression n(%)	20(20%)	6(6%)	26	3.9(1.5 – 10.2)	0.005*
Anxiety n(%)	23(23%)	8(8%)	31	3.4(1.45 – 8.1)	0.006**
Parasthesia n(%)	23(23%)	8(8%)	31	3.4(1.45 – 8.1)	0.006**
IBS n(%)	9(9%)	8(8%)	17	1.1(0.42- 3.08)	0.5

*p<0.05 significant,**p<0.01highly significant; IBS, irritable bowel syndrome, OA, osteoarthritis; n, number

Table 4: Associations between FMS and baseline characteristic features of 100 patients with knee OA

Variables	FMS	No FMS	Total	P-value
	n = 26	n =74	n=100	
Age (year), M ± SD	53.81 ± 9.3	52.41 ± 7.1	52.8 ±7.7	1.0
Sex Male, n (%)	5 (5%)	19 (19%)	24 (24%)	0.69
Female, n (%)	21 (21%)	57 (57%)	76 (76%)	
Duration of OA (year), M ± SD	3.85 ± 4.5	2.57 ± 2.4	2.9 + 3.1	0.035*
Body Mass Index (kg/m^2), M ± SD	31.9 ± 7.8	30.1 ± 4.8	31.2 ± 5.7	0.48
Waist circumference (cm), M ± SD	103.5 ± 10.2	98.3 ± 8.5	99.7 ± 9.2	0.014*
Grade of Knee OA, n (%)				
Grade1	2 (2%)	5 (5%)	7 (7%)	0.212
Grade 2	18 (18%)	38 (38%)	56 (56%)	
Grade 3	5 (5%)	29 (29%)	34 (34%)	
Grade 4	1 (1%)	2 (2%)	3 (3%)	
Family history of FMS, n (%)	15 (15%)	1 (11%)	16 (16%)	0.001**

*p<0.05 significant,**p<0.01 highly significant; M, mean, SD, standard deviation; n, number; %, percentile.

Discussion:

FMS is a chronic pain condition impacting on quality of life, causing physical and psychological impairment resulting in limited participation in professional and social life (8). Osteoarthritis of the knee is associated with significant physical disability mostly due to presence of pain (9).

Our study showed significant increase in prevalence of FMS in Iraqi patients with KOA compared to controls, and frequencies of associated features (headache, sleep disturbances, fatigue, depression, anxiety, and parasthesia) were significantly more in patients than that of controls. Longer duration of KOA, higher waist circumference, and positive family Hx of FMS were significant associates with FMS.

Up to the best of our knowledge this is the first time to investigate and report FMS in Iraqi patients with KOA.

The present study showed that patients with KOA had significantly higher prevalence of FMS (26%) than controls (7%). Previous studies are scarce and limited. Yunus reported that FMS was increased in OA (4). Another recent study done by Hawker et al (10) who found FMS was present in 11% of patients with OA. However in these studies no controls were taken. The increased FMS in KOA patients was an expected finding and the possible explanation may be that the pain associated with KOA may be associated with abnormal central processing of sensory input (11).

Another interesting finding in our study was the significant higher prevalence of associated features (headache, fatigue, sleep disturbances, depression, anxiety, and paresthesia) in patients compared to controls. This agreed with other studies (10,12). The pathophysiology of these features may be related to abnormalities of the central pain processing mechanisms (13) that result in central pain sensitization (14). It has been reported that patients with FMS have a lower melatonin secretion during the hours of darkness than do healthy subjects; this may contribute to impaired sleep at night, fatigue during the day, and changed pain perception (15).

However, no significant difference of IBS was found between patients and controls. This contrasted other studies (10, 12) which may be explained by small sample size in our study.

In addition, this study showed highly significant association between FHx of FMS and presence of FMS in patients with KOA. Similar finding was reported by Francesco etal (16) and Arnold et al (17).

In the present study, patients with FMS had significant longer disease duration and larger waist circumference than controls

however no significant association with age, sex, BMI, and grade of KOA.

A number of limitations of the current study must be pointed out. We did not perform a detailed assessment of depression and anxiety among patients who developed tenderness and other symptoms of FMS. More detailed analyses of these parameters would better characterize these aspects and would assist in the evaluation of the association between KOA and the development of FM symptoms. The relatively small size of the study sample must be noted. Despite these limitations, our findings call attention to important relationship between FMS &KOA. Because there is no specific treatment for FMS, the management of FMS is multifaceted program including education, stress management, and aerobic exercise to help the patients cope with their symptoms and improve their quality of life (18). Finally, large prospective studies may be needed to assess the cause and relationship between KOA and FMS.

Conclusions:

FMS has increased frequency in Iraqi patients with KOA. In patients with KOA, longer disease duration, large waist circumference and family history of FMS were predictors of increased FMS.

References:

1. *Amanda EN and Joanne MJ. Osteoarthritis: epidemiology and classification. In: Hochberg M C, Silman A J, Smolen JS, Weinblatt M E., Weisman M H., (eds). Rheumatology, fifth edn. Philadelphia, USA: Mosby, Elsevier: 2011; CH 13,1706-17.*

2. *Lane NE and Schnitzer TJ. Osteoathritis. In: Lee Goldman, and Andrew I. Schafer. Goldman's Cecil Medicine, 24th edn. Philadelphia, USA: Elsevier Saunders 2012;CH 270, 1672- 6*

3. *Benneth RM , Jones J, Turk DC, Russell IJ, Mathaua L. An internet survey of 2596 people with fibromyalgia. BMC musculokelet disord 2007; 118 - : 27. (IVSL)*

4. *Muhammad B. Yunus. The Prevalence of Fibromyalgia in Other Chronic Pain Conditions. Pain Research and Treatment 2012; Volume 2012, Article ID 584573, 8 pages, doi:10.1155/2012/584573*

5. *Altman R, Asch E, Bloch G, et al. Development of criteria for the classifi- cation and reporting of osteoarthritis: classification of osteoarthritis of the knee. Arthritis Rheum 1986; 29:1039–49*

6. *Wolf F, Smythe HA, Yunus MB, et al. The American College of Rheumatology 1990 Criteria for the classification of Fibromyalgia. Report of the Multicenter Criteria Committee. Arthritis Rheum 1990; 33: 160-72*

7. *Kellgren JH, Lawrence JS. Radiological assessment of osteoarthrosis. Ann Rheum Dis 1957; 16: 494-502.*

8. *Kristin Sauer, Claudia Kemper, Gerd Glaeske. Fibromyalgia syndrome: Prevalence, pharmacological and non-pharmacological interventions in outpatient health care. An analysis of statutory health insurance data. Joint Bone Spine2011; 78: 80–4 (IVSL)*

9. *Felson DT, Lawrence RC, Dieppe PA, et al. Osteoarthritis: new insights. Part 1: the disease and its risk factors. Ann Intern Med 2000;133: 635–46*

10. *Hawker GA, French MR, Waugh EJ, et al. The multidimensionality of sleep quality and its relationship to fatigue in older adults with painful osteoarthritis. Osteoarthritis Cartilage. 2010 Nov;18(11):1365-71. Epub 2010 Aug 10.*

11. *Bruce L. Kidd, Andrew Photiou, Julia J. Ingles. The role of inflammatory mediators on nociception and pain in arthritis. Osteoarthritic Joint Pain: Novartis Foundation Symposium 260. Volume 260 Edited by Derek J.Chadwick and Jamie Goode. Novartis Foundation 2004. ISBN: 0-470-86763-9*

12. *Zautra AJ, Fasman R, Reich JW, et a1.Fibromyalgia: evidence for deficits in positive affect regulation. Psychosom Med 2005; 67:147-55.*

13. *Bennett R. Fibromyalgia: present to future. Curr Rheumatol Rep 2005; 7:371–6.*

14. *Staud R, Rodriguez ME. Mechanisms of disease: pain in fibromyalgia syndrome. Nat Clin Pract Rheumatol 2006; 2:90–8*

15. *Wikner J, Hirsch U, Wetterberg L, Rojdmark S. Fibromyalgia- a syndrome with decreased nocturnal melatonin secretion. Clin Endocrinol 1998; 49: 179–83.*

16. *Francesco Ursini, Saverio Naty, Rosa Daniela Grembiale. Fibromyalgia and obesity: the hidden link. Rheumatol Int 2011; 31:1403–8 (IVSL)*

17. *Arnold LM, Hudson JI, Hess EV et al. Family study of fibromyalgia. Arthr Rheum 2004; 50:944–52*

18. *Cedraschi C, Desmeules J, Vischer TL .Fibromyalgia :pain management strategies .Ann Rheumatic Dis 2001; 60130-4:.*