Fibromyalgia in Women with Acne Vulgaris

Abdulsatar J Mathkhor[1]* and Jinan Q Mohammed[2]

[1]*Department of Rheumatologist, Rheumatology unit in Basrah Teaching Hospital Basrah, Iraq*

[2]*Department of Dermatologist, Dermatology unit in Basrah Teaching Hospital Basrah, Iraq*

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*Corresponding author: Abdulsatar J Mathkhor, Department of Rheumatologist, Rheumatology unit in Basrah Teaching Hospital Basrah, Iraq

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Background: Widespread pain and fibromyalgia syndrome (FMS) are observed in many patients with autoimmune and inflammatory disorders.

Aim: The aim of this study was to investigate the prevalence of fibromyalgia and its associated symptoms in women with acne vulgaris.

Patients and methods: sixty women with acne vulgaris and 45 age matched controls were enrolled for the study, the mean age and disease duration of the patient group were 21.75±2.1 and 6.5.0±1.5 years respectively, and the mean age of the controls was 21.3±2.8 years. Women with acne vulgaris was evaluated by using the Global Acne Scale. A two stage classification process was applied to determine the presence of FMS in women with acne vulgaris and controls. Stage 1 was answering the diffuse widespread pain questionnaire. In Stage 2, all patients with wide spread pain were examined for 18 tender points.

Results: A total of 30 (50.0%) women with acne vulgaris were found to have widespread pain. A total of 18 women met the criteria of FMS with a prevalence rate of 30.0%.

Conclusion: FMS and its associated symptoms are more prevalent in women with acne vulgaris than those in the general population. FMS was found to be associated with the severity of acne, and overweight. Proper management that decrease the severity of acne, and body weight may be associated with the alleviation of FMS symptoms in patient with acne vulgaris.

Keywords: Skin; Widespread pain; Fibromyalgia associated symptoms; Acne vulgaris; Global acne score; Autoimmune; Rheumatic diseases; menstrual irregularity

Introduction

Skin is the human body's main interface with the external environment; the skin is considered as the body's major public relations tool [1]. Therefore, any condition which affects the skin may, affect the ability of an individual to function properly in society [2], highly due to the negative psychological impact of the disease than the disease itself [1], one of these skin conditions, is acne vulgaris. Acne vulgaris is defined as a common cutaneous inflammatory disorder affecting around 9.4% of the global population and 85% of adolescents worldwide [3,4]. Its onset usually starts with the period of the secondary sexual characteristics development and may contributes to the emotional and psychological challenges encountered at this period [5]. The pathogenesis of acne vulgaris is multifactorial, in addition to the genetic predisposition, bacterial infections, hormonal disorders, sun exposure, smoking, and diet; stress play a crucial role in the pathogenesis of acne vulgaris [6].

Fibromyalgia syndrome (FMS) is a chronic diffuse widespread pain condition associated with other symptoms including morning stiffness, anxiety, fatigue, sleep disturbance, and cognitive problems [7,8]. The exact pathophysiologic mechanism of fibromyalgia is not well known, it may result from, or coexist with neuro-hormonal or immunologic disorders, genetic predisposition, infections, rheumatic diseases, physical trauma or psychological illness [9]. The possible mechanisms of the etiopathogenesis between acne and FMS, may be stress-related, and the severity of symptoms in both acne and FMS is affected by stress. Stress can modulate different adhesion molecules [10], there is a significant reduction in L-selectin and b2-integrin expression on the surface of polymorphonuclear leukocytes in patients with FMS [10]. These adhesion molecules play a crucial role in the destruction of infectious agents and removing toxic substances from the body. Since bacterial infection plays an important role in the development

of acne, a reduction in the adhesion molecules may be a common underlying pathway in the pathogenesis of both FMS and acne [10]. Stress may affect acne in different possible mechanisms, such as the secretion of inflammatory cytokines, hormones, and different neurotransmitters. Substance P, which is neuropeptide related to the stress and pain, found to be upregulated in the skin of acne patients [11]. Therefore, substance P may have an important role in the pathogenesis of both acne vulgaris and FMS [12]. FMS can associate with other rheumatologic and inflammatory disorders, like rheumatoid arthritis, systemic lupus erythematosus, psoriatic arthritis, Sjogren syndrome, and skin disorder like, psoriasis [13-17]. Some of fibromyalgia associated clinical symptoms have been addressed in patients with acne vulgaris in the literatures [18,19]. However, to our knowledge, there is only one study evaluating the frequency of FMS in patients with acne vulgaris [20]. We therefore conducted this study was to determine the prevalence of fibromyalgia and its associated clinical symptoms in patients with acne vulgaris.

Patients and Methods

This was a cross-sectional study carried out in the outpatient departments of Dermatology and Rheumatology in Basrah Teaching Hospital from January 2019 to February 2020. A sample of 60 women with acne vulgaris, diagnosed by a dermatologist in the dermatology outpatient, and 45 age matched controls recruited from the general population were enrolled for this study. The exclusion criteria were inflammatory, autoimmune, rheumatic diseases, infection, congenital adrenal hyperplasia, polycystic ovarian syndrome, diabetes mellitus, pregnancy, thyroid disorders, psychiatric disorders, and history of cancer. All participants were questioned about age, disease duration, widespread pain, and any disturbance in the menstrual cycle. Acne vulgaris was evaluated by using the Global Acne Scale [1]. This scoring scale is used to determine the severity of the acne by evaluating the types of acne lesions (no lesions= 0, comedones= 1, papules= 2, pustules= 3, and nodules= 4) and their anatomic locations (forehead= 2, right cheek= 2, left cheek= 2, nose= 1, chin= 1, chest and upper back= 3). The local score is determined by multiplying the anatomic location score by the grade (0-4), and the global score is the sum of the local scores. The Global Acne Scale score ranges from 0 (no acne), 1-18 (mild acne), 19-30 (moderate acne), 31-38 (severe acne), and >39 (very severe acne) [1]. A diagnosis of FMS was confirmed according to the two-stage classification process that was proposed by the 1990 ACR classification criteria for FMS (7). Stage 1 was composed of the patients answering the diffuse widespread pain questionnaire. Stage 2 comprised evaluation of all patients and controls complaining of diffuse pain; this evaluation included the assessment of 18 tender points and 4 control non-tender points through digital palpation with an approximate force of 4 kg (the amount of pressure required to blanch a nail). The four control non-tender points are: the middle of the forehead, the volar aspect of the mid forearm, the thumb nail, and the muscles of the anterior thigh. To meet the diagnostic criteria, musculoskeletal pain had to have been present for at least 3 months, and pain must have been present in 11 or more out of 18 specific tender points on digital palpation. All participants were evaluated by a rheumatologist, by answering questionnaires about the following FMS associated symptoms: morning stiffness, sleep disturbance, fatigue, headache, anxiety, and irritable bowel

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki, and verbal consent was obtained from all participants prior to their involvement.

Statistical Analysis

SPSS Software version 25.0 was used for data analysis. Percentages and mean was used to present the data in tables. Comparison of study groups was carried out using chi-square and Fisher's exact test for categorical data, and Student's t-test for continuous data. P-value of < 0.05 was considered statistically significant.

Result

Table 1 shows the demographic distributions of both patients and control groups. There were 60 women with acne vulgaris with mean age and disease duration of 21.75 ± 2.1 and $6.5.0\pm1.5$ years respectively. There were 30 (50.0%) women with widespread pain compared with 3 (6.6%) women with widespread pain in the control group which is a statistically significant difference (P<0.05) as shown in Table 2. There were 18 (30.0%) women fulfilled the 1990 ACR criteria for classification of FMS in the patients group, compared to 1 (2.2%) woman in the control group, difference is also statistically significant (P<0.05). Table 3 shows the frequency of clinical, and FMS associated features in women with acne vulgaris and in the controls, FMS associated features, with the exception of morning stiffness were all more frequent in patient group than in controls in a statistically significant difference (all P<0.05). Menstrual disturbances were more frequent in patients group than in the controls and the difference is statistically significant (P<0.05). Global acne score was 35 ± 2.3 in women with FMS, whereas it was 22.1 ± 3.3 in acne women without FMS. Body mass index was 30 ± 1.8 in women with FMS, whereas it was 20.5 ± 1.3 in acne women without FMS.

Table 1: The demographic data of both women with acne vulgaris and controls.

Characteristics	Acne Vulgaris	Controls	P Value
Total No. (%)	60(100%)	45(100%)	
Age	21.75±2.1	21.3±2.8	>0.05
Disease duration	6.5±1.5		

Table 2: Frequency of FMS in women with acne vulgaris vs. controls.

	Acne vulgaris	Controls	P value
Total No.	60	45	
Widespread pain	30(50.0%)	3(6.6%)	<0.05
FMS	18(30.0%)	1(2.2%)	<0.05

Table 3: The distribution of FMS associated, and clinical features in women with acne vulgaris and controls.

Characteristics	Acne Vulgaris	Controls	P Value
Total (%)	60(100%)	45(100%)	
Morning stiffness	4(6.6%)	1(2.2%)	>0.05
Sleep disturbance	29(48.3%)	2(4.5%)	<0.05
Anxiety	28(46.6%)	2(4.5%)	<0.05
Depression	26(43.3%)	2(4.5%)	<0.05
Fatigue	26(43.3%)	1(2.2%)	<0.05
Irritable bowel	25(41.6%)	1(2.2%)	<0.05
Menstrual disturbances	30(50.0%)	3(6.6%)	<0.05
Global Acne Scale in (mean)			
Patients with FMS	35.0±2.3(severe)		<0.001
Patients without FMS	22.1±3.3 (moderate)		
Body Mass Index			
Patients with FMS	30.0±1.8 (overweight)		<0.001
Patients without FMS	20.5± 1.3 (normal weight)		

Discussion

In this study, widespread pain was found to be more prevalent in women with acne vulgaris than in the control group in a prevalence rate of 50.0% and 6.6% respectively. The prevalence rate of FMS among women with acne vulgaris was found to be 30.0% which is higher when compared to a study done by Yazmalar et al. [20] who found FMS was affected 16% of women in his study group, and another study done by Thune [17] who found FMS was affected 13% of women with psoriasis which is another distressing skin disease, and it seems to be low when compared to a study done by Torresani et al. [21] who found the prevalence rate of FMS was 53.9% in women with chronic urticaria. The prevalence rate of FMS in our study population is considered high when compared to the prevalence rate in the control group and in women in the general population [22]. Therefore, FMS is more prevalent in women with acne vulgaris than in the general population. The increase risk of developing FMS among acne vulgaris patients may be attributed to the common underlying pathway in the pathogenesis of both FMS and acne [10]. Sleep disturbance, anxiety, depression, and fatigue were the most common non-musculoskeletal manifestations recorded in patients with acne vulgaris in this study. In contrast to Misery et al finding [18], we found that sleep disturbance was more common in acne vulgaris women than in healthy controls. Previous studies have reported that patients with acne vulgaris have increased frequency of anxiety [23,24], we also recorded a comparable finding in our study. Depression was more frequent among our study group, finding is comparable to other studies [25,26], but it is not in agreement with some other studies [24,27]. Fatigue was more frequent among our study group patients than in the controls, this finding is in contrast to a study done by Yazmalar et al. [20] who found no difference in the frequency of fatigue between the acne patients and healthy controls.

Many women experience a worsening of acne during the premenstrual cycle [28]. We found that menstrual cycle disturbance was more common in women with acne vulgaris than in healthy controls, this finding is in agreement with Yazmalar et al. [20], Finding Premenstrual exacerbation of acne is multifactorial [29]. Higher levels of androgens and oestrogens during the follicular phase and periovulation causes increased sebum production, higher level of skin lipids, and subsequent increase in skin microflora resulting in acne exacerbation. Combined oestrogen/ progesterone contraceptives cause improvement in acne by

decreasing the amount of free, biologically active androgens [30]. In our study FMS was more frequent in women with severe acne than those with moderate one, result not in agreement with Law et al. [31] Finding who recorded that the clinical severity of acne did not correlate strongly with the effect on the quality of life (QoL), and the QoL of adolescents is not only determined by acne severity. The relationship between obesity and fibromyalgia has been addressed in literature [32], in our study, FMS was more frequent in overweight acne women than those with normal weight. It is reported that; successful weight management changes the expression of FMS [32].

Conclusion

FMS and its associated symptoms are more prevalent in women with acne vulgaris than women in the general population. FMS was found to be associated with the severity of acne, and overweight. Proper management that decrease the severity of acne, and body weight may be associated with the alleviation of FMS symptoms in women with acne vulgaris.

Acknowledgment

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