

Original Research Article

Fibromyalgia in patients with acne vulgaris

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Abstract

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Widespread pain and fibromyalgia syndrome (FMS) are observed in many patients with autoimmune and inflammatory disorders. The aim of this study was to investigate the prevalence of fibromyalgia and its associated symptoms in patients with acne vulgaris. Ninety-one patients with acne vulgaris and 84 sex and 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 ± 1.5 years respectively. Acne vulgaris was evaluated by using the Global Acne Scale. A two stage classification process was applied to determine the presence of FMS in patients 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. A total of 35 (38.4%) patients with acne vulgaris were found to have widespread pain. A total of 21 patients met the criteria of FMS with a prevalence rate of 23.0%; of them, 18 (85.7%) were women. FMS and its associated symptoms are more prevalent in patients with acne vulgaris than in the general population. Women with acne vulgaris are more frequently affected by FMS. FMS was found to be associated with the severity of acne, and overweight.

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

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 (Ogedegbe and Henshaw 2012). Therefore, any condition which affects the skin may, affect the ability of an individual to function properly in the society (Ayer and Burrows, 2006), highly due to the negative psychological impact of the disease than the disease itself (Ogedegbe and Henshaw, 2012), 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 (Stollery, 2013; Tan and Bhate, 2015). Its onset usually starts with the period of the secondary sexual characteristics development and may contribute to the emotional and psychological challenges encountered at this period (Laurent Misery,

2011). 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 (R.G.R. et al., 2014).

Fibromyalgia syndrome (FMS) is a chronic diffuse widespread pain condition associated with other symptoms including morning stiffness, anxiety, fatigue, sleep disturbance, and cognitive problems (Wolfe et al., 1990; Frederick Wolfe et al., 2010; 2016). 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 (Buskila et al., 2008). 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 (Kaufmann et al., 2009), there is a significant reduction in L-selectin and b2-integrin expression on the surface of polymorphonuclear leukocytes in patients with FMS (Kaufmann et al., 2009). 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 (Kaufmann et al., 2009). 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 (Toyoda et al., 2002). Therefore, substance P may have an important role in the pathogenesis of both acne vulgaris and FMS (Clauw, 2014). FM can associate with other rheumatologic and inflammatory disorders, like rheumatoid arthritis, systemic lupus erythematosus, psoriatic arthritis, Sjogren syndrome, ankylosing spondylitis and skin disorder like, psoriasis (Amiri and Sedighi, 2014; Middleton et al., 1994; Wolfe et al., 1984; Magrey et al., 2013a; Thune 2005; Torrente-Segarra et al., 2017). Some of fibromyalgia associated clinical symptoms have been addressed in patients with acne vulgaris in the literatures (Lauren Misery et al., 2015; Silverberg and Silverberg, 2014). However, to our knowledge, there is only one study evaluating the frequency of FMS in patients with acne vulgaris (Yazmalar et al., 2016). 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 91 (31 male and 60 female) patients with acne vulgaris, diagnosed by dermatologist in the dermatology outpatient, and 84 sex and 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, sex, disease duration, widespread pain, and females were questioned about any disturbance in the menstrual cycle. Acne vulgaris was evaluated by using the Global

Acne Scale (Ogedegbe and Henshaw, 2012). This sorting 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 (Wolfe et al., 1990). 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 (Wolfe et al., 1990). 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 (Wolfe et al., 1990; Lauren Misery et al., 2015; Grahame et al., 2002; Golchai et al., 2010; AlHuzali et al., 2014; Öztürk et al., 2013).

Consent form

All patients gave their informed verbal consent to participate in the study before enrolment in the study.

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.

RESULTS

Table 1 shows the demographic distributions of both patients and control groups. From the total 91 patients

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

Characteristics	Acne vulgaris	Controls	P value
Total No.(%)	91(100%)	84(100%)	
Men	31(34.1%)	30(35.7%)	>0.05
Women	60(65.9%)	54(64.3%)	
Age	21.75±2.1	21.3±2.8	>0.05
Disease duration	6.5±1.5		

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

	Acne vulgaris	Controls	P value
Total No.	91	84	
Widespread pain	35(38.4%)	5(5.9%)	<0.05
FMS:	21(23.0%)	1(1.2%)	<0.05
Men	3(14.3.0%)	0(0%)	
Women	18(85.7%)	1(100%)	

Table 3. The distribution of FMS associated, and clinical features in both acne vulgaris patients and controls

	Acne vulgaris	Controls	P value
Total (%)	91(100%)	84(100%)	
Morning stiffness	3(3.3%)	2(2.4%)	>0.05
Sleep disturbance	37(40.6%)	3(3.57%)	<0.05
Anxiety	35(38.5%)	3(3.57%)	<0.05
Depression	29(31.8%)	2(2.38%)	<0.05
Fatigue	33(36.2%)	3(3.57%)	<0.05
Irritable bowel	24(26.3%)	2(2.38%)	<0.05
Menstrual disturbances	30/60(50.0%)	3/54(5.5%)	<0.05
Global Acne Scale in (mean)			
Patients with FMS	34.8±2.3(severe)		<0.001
Patients without FMS	22.17±3.3 (moderate)		
Body Mass Index			
Patients with FMS	28.1±1.8 (overweight)		<0.001
Patients without FMS	20.6± 1.8 (normal weight)		

with acne vulgaris; there were 31 (34.1%) males and 60 (65.9%) females. There were 35 (38.4%) patients with widespread pain compared with 5 (5.9%) individuals with widespread pain in the control group which is a statistically significant difference ($P<0.05$) as shown in table 2. There were 21 (23.0%) (18 females and 3 males) patients fulfilled the 1990 ACR criteria for classification of FMS in the patients group, compared to 1 (1.2%) in the control group, difference is also statistically significant ($P<0.05$). Women were more obviously having FMS compared to men in a proportion of 6:1 as shown in table 2. Table 3 shows the frequency of clinical, and FMS associated features of both acne vulgaris patients and 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 34.8 (SD=2.3) in patients with FMS, whereas it was 22.17 (SD=3.3) in acne patients without FMS. Body mass index was 28.8 (SD=1.8) in patients with FMS, whereas it was 20.6 (SD=1.8) in acne patients without FMS.

DISCUSSION

In this study, widespread pain was found to be more prevalent in the acne vulgaris group than in the control group in a prevalence rate of 38.4% and 5.9% respectively, whereas the prevalence rate of FMS among patients with acne vulgaris was found to be 23.0% which is comparable to a study done by Yazmalar et al., (Yazmalar et al., 2016) who found FMS was in 21.6% of his study group. However, the prevalence rate of FMS in patients with acne vulgaris in our study was higher than

that in patients with psoriasis (Thune, 2005), and it seems to be low when compared to a study done by Torresani et al. (Torresani et al., 2009), who found the prevalence rate of FMS was 70.6% in patients with chronic urticaria which may be more distressing disease than acne vulgaris, and was lower than that of some rheumatological disorders such as, a prevalence rate of 25% in patients with RA, 30% in patients with SLE, 37.5% in patients with psoriatic arthritis, and 50% in patients with Sjogren syndrome (Wolfe et al., 1984; Middleton et al., 1994; Vitali et al., 1989; Magrey et al., 2013b), difference may be related to the nature of these originally painful disorders. In our study, the prevalence rate is considered high when compared to the that in the general population (Wolfe et al., 1995). Women showed a 6-fold higher occurrence of FMS than men, whereas the ratio is 3:1 in the general population. Therefore, FMS is more prevalent in women with acne vulgaris than in the general population. This result is comparable with findings of other studies that found a female predominance of FMS in different rheumatic and skin disorders (Middleton, Mcfarlin, and Lipsky 1994; Thune 2005; S et al., 1998; Amiri and Sedighi, 2014). 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 (Kaufmann et al., 2009). Except for morning stiffness which is usually associated with rheumatic disorders (Amiri and Sedighi, 2014; Middleton et al., 1994; Wolfe et al., 1984; Magrey et al., 2013a; Torrente-Segarra et al., 2017), 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 (Lauren Misery et al., 2015), we found that sleep disturbance was more common in acne vulgaris patients than in healthy controls. Previous studies have reported that patients with acne vulgaris have increased frequency of anxiety (Grahame et al., 2002; Golchai et al., 2010), we also recorded a comparable finding in our study. Depression was more frequent among our study group, finding is comparable to other studies (AlHuzali et al., 2014; Öztürk et al., 2013), but it is in contrast with some other studies (Golchai et al., 2010; Duman et al., 2016). 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., (Yazmalar et al., 2016) 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 (Dréno et al., 2013). In this study we found that, menstrual cycle disturbance was more common in females with acne vulgaris than in healthy females in the control group, this finding is in agreement with Yazmalar et al., finding (Yazmalar et al., 2016). Premenstrual exacerbation of acne is multifactorial (Steventon, 2011). Higher levels of androgens and oestrogens during the follicular phase and

periovalation causes increased sebum production, higher level of skin lipids, and subsequent increase in skin microflora resulting in acne exacerbation. Suppressing the biologically active androgens by using the combined contraceptive pills results in improvement in acne (Carey and Allen, 2012). In our study FMS was more frequent in patient with severe acne than in patients with moderate one, result is not in agreement with Law et al, finding (Law et al., 2010) 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 (Öztekin et al., 2008), in our study, FMS was more frequent in overweight acne patients than in normal weight patients. It is reported that; successful weight management changes the expression of FMS (Öztekin et al., 2008).

CONCLUSIONS

FMS and its associated symptoms are more prevalent in patients with acne vulgaris than in the general population. Women with acne vulgaris are more frequently affected by FMS than men. 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.

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Conflict of Interest

There is no any conflict of interest declare.

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