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ORIGINAL ARTICLE

High Frequency of Fibromyalgia in Patients With Acne Vulgaris

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ABSTRACT

Objectives: This study aims to investigate the frequency of fibromyalgia syndrome and to specify fibromyalgia syndrome-associated clinical symptoms in patients with acne vulgaris.

Patients and methods: Eighty-eight patients (28 males, 60 females; mean age 23.2±5.1 years; range 18 to 40 years) with acne vulgaris and age, sex- and body mass index-similar 76 healthy controls (14 males, 62 females; mean age 24.5±2.9 years; range 18 to 35 years) were included. Acne vulgaris was evaluated by using the Global Acne Scale, while Hospital Anxiety and Depression Scale was used to evaluate anxiety.

Results: Fibromyalgia-associated pain, sleep disturbance, anxiety, and menstrual cycle disturbance were significantly more frequent in patients with acne vulgaris than controls. Also, the severity of anxiety and the number of tender points were significantly higher in the acne vulgaris patients than controls.

Conclusion: This study indicates that patients with acne vulgaris have increased frequency of fibromyalgia syndrome than healthy controls (21.6% versus 5.3%, respectively).

Keywords: Acne vulgaris; fibromyalgia; pain.

Fibromyalgia syndrome (FMS) is a chronic disorder characterized by widespread body pain and tender points that have a painful response to finger pressure. Patients with FMS also frequently experience fatigue, arthralgia, morning stiffness, sleep disturbance, headache, and anxiety.[1] Although the actual pathophysiologic mechanism of FMS is not known precisely, it may result from neuro-hormonal and immunologic disorders, genetic predisposition, infections, rheumatic diseases, physical trauma or psychological illness.[2]

Acne vulgaris is a widespread inflammatory disease of the skin. Among the general population, acne occurs in about 80% of teenagers and 25% of adults.[3] Many factors can cause acne, including stress, genetic predisposition, bacterial infections, hormonal disorders, cosmetics, sun exposure, smoking or diet.[4] Also, FMS-related clinical symptoms such as fatigue, sleep disturbance or anxiety have been addressed in patients with acne vulgaris in the literature.[5,6] However, to the best of our knowledge, there is no study evaluating the frequency of FMS in patients with acne vulgaris. Therefore, in this study, we aimed to investigate the frequency of FMS and to specify FMS-associated clinical symptoms in patients with acne vulgaris.

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PATIENTS AND METHODS

Eighty-eight patients (60 females, 28 males; mean age 23.2±5.1 years; range 18 to 40 years) with acne vulgaris were enrolled between November 2014 and April 2015 from among patients who admitted to Department of Dermatology Outpatient Clinic at Dicle University Medical School. Seventy-six age-, sex- and body mass index-similar healthy controls (14 males, 62 females; mean age 24.5±2.9 years; range 18 to 35 years) were recruited from the staff of the same hospital and patients' relatives without acne vulgaris. The hospital's ethical review board approved the study protocol and written informed consent was obtained from all participants prior to their involvement. The study was conducted in accordance with the principles of the Declaration of Helsinki.

American College of Rheumatology diagnostic criteria were used for the diagnosis of FMS.[7] Acne vulgaris was evaluated by using the Global Acne Scale. 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).[8]

Participants in this study were asked to answer questions (does it exist or not) related to fatigue, widespread body pain, sleep disturbance, irritable bowel syndrome, headache, morning stiffness, menstrual cycle disturbance, and arthralgia. Arthralgia and FMS-related tender points were assessed by the same physiatrist. Hospital Anxiety and Depression Scale was used to assess anxiety. Pain severity was measured by using a 0-10 cm visual analog scale.

Patients were excluded if they had infections, inflammatory diseases, malignancy, osteoporosis, cervical/lumbar disc herniation, congenital adrenal hyperplasia, polycystic ovarian syndrome, diabetes mellitus, chronic disease, pregnancy, or if they had received systemic treatment within the last three months.

Statistical analysis

Descriptive statistics for continuous variables were expressed as the mean ± standard deviation, median, and categorical variables were expressed as numbers and percentage. The normality of continuous variables was analyzed using Kolmogorov-Smirnov test. Chi-square test was used to assess differences in categorical variables, while differences in continuous variables between the groups were evaluated with Student's t-test and Mann-Whitney U test. Correlations between continuous variables were evaluated by Pearson correlation analysis. Level of statistical significance was set at a p value ≤0.05. All statistical analyses were performed by using SPSS for Windows version 16.0 software (SPSS Inc., Chicago, IL, USA).

RESULTS

Demographic and clinical characteristics of the subjects are given in Table 1. There were no significant differences regarding age,

Table 1. Demographic and clinical data of the subjects

	Acne vulgaris patients (n=88)				Controls (n=76)		
	n	Mean±SD	Median	Min.-Max.	n	Mean±SD	p
Age (years)		23.2±5.1				24.5±2.9	0.053
Gender							0.072
Female	60				62		
Male	28				14		
Body mass index		21.9±2.8				22.3±2.9	0.416
Disease duration (months)		73.7±53.9				–	–
Global acne score			12	3-31		–	–

SD: Standard deviation; Min.: Minimum; Max.: Maximum.

Table 2. Comparison of the clinical characteristics of the subjects

	Acne vulgaris patients (n=88)				Controls (n=76)				
	n	%	Median	Min.-Max.	n	%	Median	Min.-Max.	*p*
Fibromyalgia syndrome		21.6				5.3			0.003
Tender point count			4	0-18			2	0-16	<0.001
Visual analog scale			1	0-10			1	0-8	0.850
Widespread body pain		30.7				19.7			0.151
Sleep disturbance		51.1				35.5			0.045
Fatigue			46	52.3			30	39.5	0.118
Anxiety		36.4				21.1			0.039
Anxiety score (HADS)			5	1-18			3	1-15	0.045
Arthralgia	29	33			15	19.7			0.077
Irritable bowel syndrome		15.9			5	6.6			0.086
Morning stiffness	4	4.5			4	5.3			0.832
Headache		39.8			34	44.7			0.531
Menstrual cycle disturbance	19	31.7			10	16.1			0.048

Min.: Minimum; Max.: Maximum; HADS: Hospital anxiety and depression scale.

sex or body mass index between the groups (all *p* values >0.05). Approximately 99% of the acne patients had mild (n=73) or moderate (n=14) acne severity.

Comparison of the clinical characteristics of the subjects is given in Table 2. FMS frequency, sleep disturbance, anxiety, and menstrual cycle disturbance were significantly higher in the acne patients than in the controls (all p<0.05).

Comparisons of acne patients with and without FMS in terms of clinical characteristics are listed in Table 3. There were no significant differences regarding global acne score, morning stiffness or age between the two groups (all p>0.05). Number of tender points, visual analog scale score or widespread body pain, sleep disturbance, fatigue, anxiety, arthralgia, irritable bowel syndrome, and headache were more frequent in the acne patients with FMS than without FMS (all p<0.05). In addition, there was no significant correlation between acne severity and number of tender point (r= −0.194, p=0.070), disease duration (r= −0.074, p=0.491), anxiety score (r= −0.075, p=0.490) or visual analog scale pain score (r= −0.107, p=0.320).

DISCUSSION

We have demonstrated that acne vulgaris patients have higher frequency of FMS, sleep disturbance, anxiety, and menstrual cycle disturbance than healthy controls. Also, we have found higher scores in terms of the number of

Table 3. Clinical characteristics of acne vulgaris patients with and without fibromyalgia syndrome

	Patients with FMS (n=19)					Patients without FMS (n=69)					
	n	%	Mean±SD	Median	Min.-Max.	n	%	Mean±SD	Median	Min.-Max.	*p*
Global acne score				9	4-20				13	3-31	0.334
Tender point counts				12	11-18				3	0-13	<0.001
Visual analog scale				6	2-10				1	0-9	<0.001
Widespread body pain	18	94.7				9	13				<0.001
Sleep disturbance	16	84.2				29	42				0.001
Fatigue	18	94.7				28	40.6				<0.001
Anxiety	15	78.9				17	24.6				<0.001
Anxiety score (HADS)	13	2-18				3	1-17				<0.001
Arthralgia	13	68.4				16	23.4				<0.001
Irritable bowel syndrome	6	31.6				8	11.6				0.045
Morning stiffness	2	10.5				2	2.9				0.202
Headache	13	68.4				22	31.9				0.005
Age			23.5±6.8					23.1±4.5			0.78

FMS: Fibromyalgia syndrome; SD: Standard deviation; Min.: Minimum; Max.: Maximum; HADS: Hospital anxiety and depression scale.

tender points, pain, sleep disturbance, fatigue, anxiety, arthralgia, irritable bowel syndrome, and headache in the acne patients with FMS than without FMS.

The skin of FMS patients has several objective differences when compared to that of healthy controls. In particular, FMS patients have increased mast cell counts and inflammatory cytokines in the skin, altered collagen metabolism, cutaneous microcirculatory changes, autonomic nervous system dysfunction, and increased cutaneous opioid receptors.[9] Laniosz et al.[9] reported that FMS patients experience increased sweating (32%), dermatitis (9.1%), pruritus (3.3%), psoriasis (2.6%), acne (2.1%), rosacea (2.1%), burning skin sensation (2%), cutaneous pain (1.7%), and urticaria (1.5%). Acne begins with abnormal keratinization and a complex interplay between sebum production, hypersensitivity to androgen stimulation, changes in lipid compound, Propionibacterium acnes, and local inflammatory cytokines elaborated by the innate immune system.[10]

Stress-related factors may be possible etiopathogenetic mechanisms between FMS and acne, because stress might affect the severity of symptoms in both FMF patients and acne patients. Stress has been shown to modulate adhesion molecules.[11] Kaufmann et al.[11] have found a significantly decreased L-selectin and β_2-integrin expression on the surface of polymorphonuclear leukocytes in patients with FMS. These adhesion molecules are involved in destroying infectious organisms and removing toxic substances and debris from body.[11] Given that there is a relationship between acne and bacterial infections, a reduction in the adhesion molecules may be a common underlying pathway in the pathogenesis of patients with both FMF and acne.

Although the exact mechanisms of how stress causes acne remain unclear, possible mechanisms, such as secretion of neurotransmitters, cytokines, and hormones have been proposed. Skin is involved in neuroendocrine function and stress response, and the skin of acne patients contains a higher expression of genes related to corticotrophin-releasing hormone (in response to physiologic stress) than normal skin.[12,13] Substance P, an important neuropeptide related to the stress response and pain, is also upregulated in the skin of acne patients when compared to healthy controls.[14] Therefore, substance P may play a role in the pathogenesis of both FMS and acne vulgaris.[15]

Previous studies have reported that patients with acne vulgaris have increased frequency and severity of anxiety.[16,17] These data correlate with our results. In our current study, patients with acne vulgaris had higher frequency and severity of anxiety than controls. It has been reported that many chronic painful conditions and rheumatic diseases are related to poor sleep quality.[18,19] We also found higher frequency of poor sleep quality in acne patients than in healthy controls. Menstrual cycle is related to the presence of sleep disturbances and many women experience a worsening of acne during the premenstrual cycle.[20] We found that menstrual cycle disturbance was more common in female acne patients than in female healthy controls. Patients who are stressed are more often tired and suffered from poor sleep quality. In our study, the existence of acne was highly related with fatigue. Misery et al.[5] reported that morning fatigue may be related to sleep disorders or depression, and that fatigue may be a result of sleep disorders. However, they did not find any relationship between sleep disorders and fatigue. Like this report, there were no significant differences in fatigue and morning stiffness between the acne patients and healthy controls in our study.

We found higher frequency of FMS in patients with acne than in healthy controls. A literature search revealed that there are three published studies regarding FMS frequency in chronic urticaria,[21-23] and one study in psoriasis.[24] However, to the best of our knowledge, there is no study regarding FMS frequency in acne patients. Torresani et al.[21] found that 70.6% of patients with chronic urticaria had FMS, but this study did not address FMS-related symptoms. Yener et al.[22] reported that the frequency of FMS was similar between the chronic urticaria patients and healthy controls. In a more recent study, 32.5% of chronic urticaria patients had FMS. In addition, chronic urticaria patients had more complaints involving chronic widespread pain, anxiety, depression, sleep disturbances, fatigue, morning stiffness, and swollen soft tissues than healthy controls.[23] Thune et al.[24] found that 8.3% of patients with psoriasis had FMS. However, they did not compare their results with healthy controls.

Among the general population, FMS occurs in 3.4% to 4.9% of females and 0.5-1.6% of males.[25] In the present study, 19 of the patients with acne (5 males, 14 females) had FMS. It has been reported that female FMS patients have significantly more intense pain, higher tender point counts, and a greater incidence of depression relative to male FMS patients.[26] Therefore, the greater number of female FMS patients in this study may account for the differences in symptom intensity and frequency of clinical variables (e.g. pain or psychiatric disorders).

Our study had some limitations. Firstly, this study did not evaluate the role of inflammatory markers. Secondly, fatigue and sleep disturbance were not assessed by using a specific questionnaire such as the Multidimensional Fatigue Inventory or Pittsburgh Sleep Quality Index. Thirdly, the Fibromyalgia Impact Questionnaire was not applied in our patients. Finally, the present study did not include a severe acne population. It has been reported that severe acne is related with higher frequencies of gastrointestinal, sinopulmonary, and psychological disorders.[6]

In conclusion, to the best of our knowledge, this is the first study to explore the frequency of FMS in patients with acne vulgaris. FMS is a widespread and generally underdiagnosed condition in persons with comorbidities. We found a high frequency (21.6%) of FMS in patients with acne vulgaris. Our findings may increase awareness of clinicians to this coexistence and facilitate diagnostic and therapeutic process.

Declaration of conflicting interests

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