FEMALE SEXUAL DYSFUNCTION MAY BE ASSOCIATED WITH LOW SLEEP QUALITY IN PATIENTS WITH FIBROMYALGIA

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ORIGINAL ARTICLE

Effects of low sleep quality on sexual function, in women with fibromyalgia

AS Amasyali[1], E Taştaban[2], SY Amasyali[3], Y Turan[2], E Kazan[1], E Sari[4], B Erol[5], M Cengiz[6] and H Erol[1]

Sexual dysfunction is a common experience in women with fibromyalgia. However, the physiopathology of this association is unclear. We aimed to evaluate whether sleep disturbance has an influence on sexual function in women with fibromyalgia. Fifty-four sexually active premenopausal women with fibromyalgia were enrolled in the study. The following questionnaires were used: the Female Sexual Function Index (FSFI), the Pittsburgh Sleep Quality Index (PSQI), the Fibromyalgia Impact Questionnaire (FIQ) and the Beck Depression Inventory (BDI). Appropriate statistical analyses were used by using SPSS 18. The mean FSFI score was 25.344 ± 6.52 and showed no correlation with age, body mass index, BDI or duration of fibromyalgia. However, a positive correlation between sexual dysfunction and low sleep quality was found ($r = 0.43$; $P = 0.001$). In addition, the median FSFI score was 29.2 (27.2–32.4) in patients with higher sleep quality (PSQI ⩽ 5), whereas it was 21.4 (18.9–25.3) in patients with lower sleep quality (PSQI > 5) ($P < 0.001$). There was a positive correlation between sexual dysfunction and symptoms of fibromyalgia as indicated by a higher FIQ score ($r = 0.37$; $P = 0.006$). Sexual dysfunction in female patients with fibromyalgia may be due to low sleep quality. Treatment of the sleep disorder may improve female sexual function.

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INTRODUCTION

Fibromyalgia (FM) is a musculoskeletal disorder that presents with widespread pain, fatigue, sleep disruption, depression-anxiety and cognitive disturbance. It affects ~2% of adults, and women are four to seven times more affected than men.[1–3] Widespread pain must last >3 months, and there must be pain with palpation of at least 11 of 18 tender points as defined by the American College of Rheumatology.[4] Recently, the American College of Rheumatology reported a modified diagnostic criteria for FM, which includes the level of severity of fatigue, waking feeling unrefreshed, cognitive symptoms and measurement of chronic widespread pain using the widespread pain index.[5] Although it is not the first reason for admission, sexual dysfunction (SD) is very common in women with FM, and some series have found co-occurrence of up to 97%.[6]

The main cause of SD in patients with FM is unknown. However, most studies found that anxiety and depression, using psychotropic drugs and having a sleep disorder, were frequently found among FM patients and may be in response to SD.[7] Sleep disorder itself has an adverse affect on sexuality in the normal population. This negative effect has been confirmed by many studies in women with obstructive sleep apnea syndrome.[8–10] The leading causes of SD in obstructive sleep apnea syndrome may include the use of psychotropic drugs,[8] psychogenic issues[9] and endocrine abnormalities, especially decreased progesterone.[10]

The aim of this study was to evaluate sexual function and sleep disorder in sexually active premenopausal women with primary FM who were not previously treated and to investigate whether sleep disorder itself leads to SD in these patients.

MATERIALS AND METHODS

This collaborative study was performed by departments of urology and physical therapy and rehabilitation and was approved by the institutional ethics committee (Adnan Menderes University, 2014/519). Fifty-four sexually active premenopausal women who were admitted to the physical therapy and rehabilitation outpatient clinic and who met the 1990 FM classification criteria were enrolled in the study. All patients had a new diagnosis of FM and had not been previously treated. The duration of complaints, the tender points count (TPC) and the visual analog scale score (VAS) were recorded. For evaluation of quality of life, the Short Form 36 (range 0–100, with higher scores indicative of higher quality of life) was used. Informed consent was signed by all patients. The FM Impact Questionnaire (FIQ) was used to assess disease severity, with higher scores indicating more severe disease. Patients with severe cardiopulmonary insufficiency, uncontrolled comorbid (hypertension, diabetes mellitus) diseases, usage of psychotropic medications and drugs with sexual side effects were excluded from the study.

The Female Sexual Function Index (FSFI) is a brief, 19-item self-administered questionnaire that was used to assess female SD. All domains of the FSFI scores, including desire, arousal, lubrication, orgasm, satisfaction and pain, were recorded. A cutoff value of 26.55 has an accuracy of 70.7% and 88.1% for women with and without SD, respectively.[11] The Beck Depression Inventory (BDI), a 21-item, self-administered inventory that measures clinical depression, was administered to the patients. Scores range from 0 to 63, and higher scores are indicative of depression.[12]

Sleep disturbance was evaluated by the Pittsburgh Sleep Quality Index (PSQI). The Pittsburgh Sleep Quality Index (PSQI) is a 19-item, self-administered questionnaire that assesses sleep quality and disturbances over the last month. A global PSQI score >5 is accepted as indicating poor sleep quality.[13] All questionnaires were completed under the supervision of a physician.

[1]Adnan Menderes University School of Medicine, Department of Urology, Aydin, Turkey; [2]Adnan Menderes University School of Medicine, Department of Physical Therapy and Rehabilitation, Aydin, Turkey; [3]Adnan Menderes University School of Medicine, Department of Algology, Aydin, Turkey; [4]Balikesir University School of Medicine, Department of Urology, Balikesir, Turkey; [5]Istanbul Medeniyet University Faculty of Medicine, Department of Urology, Goztepe Kadikoy, Istanbul and [6]Adnan Menderes University School of Medicine, Department of Biostatistics, Aydin, Turkey. Correspondence: Dr AS Amasyali, Adnan Menderes University School of Medicine, Department of Urology, Aydin 09000 Turkey.
E-mail: drakinsoner@gmail.com
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Table 1. Spearman's correlation analysis of the variables

	Total FSFI	*BDI*	*VAS*	*PSQI*	*FIQ*	*TPC*	*Duration*	*BMI*
Age	$r=0.101$ $P=0.469$	$r=0.248$ $P=0.071$	$r=-0.065$ $P=0.641$	$r=-0.122$ $P=0.381$	$r=-0.152$ $P=0.272$	$r=0.266$ $P=0.052$	$r=0.104$ $P=0.455$	$r=-0.079$ $P=0.571$
BMI	$r=-0.110$ $P=0.430$	$r=0.055$ $P=0.692$	$r=-0.102$ $P=0.462$	$r=0.011$ $P=0.940$	$r=-0.017$ $P=0.906$	$r=0.086$ $P=0.537$	$r=-0.165$ $P=0.234$	
Duration	$r=0.107$ $P=0.442$	**$r=0.307$** **$P=0.024$**	$r=0.021$ $P=0.883$	$r=0.039$ $P=0.781$	**$r=0.315$** **$P=0.02$**	$r=0.075$ $P=0.592$		
TPC	**$r=0.480$** **$P=0.000$**	$r=0.017$ $P=0.902$	**$r=-0.314$** **$P=0.021$**	$r=-0.219$ $P=0.112$	$r=-0.134$ $P=0.332$			
FIQ	**$r=-0.372$** **$P=0.006$**	**$r=0.290$** **$P=0.033$**	**$r=0.349$** **$P=0.010$**	**$r=0.341$** **$P=0.012$**				
PSQI	**$r=-0.434$** **$P=0.001$**	$r=-0.005$ $P=0.972$	**$r=0.535$** **$P=0.000$**					
VAS	**$r=-0.625$** **$P=0.000$**	$r=0.247$ $P=0.072$						
BDI	$r=-0.163$ $P=0.238$							

Abbreviations: bDI, beck depression inventory; BMI, body mass index; FIQ, fibromyalgia impact questionnaire; FSFI, female sexual function index; PSQI, Pittsburgh sleep quality index; TPC, tender points count; VAS, visual analog scale. *P*-values < 0.05 are considered statistically significant and bold values indicate the significant correlations.

Statistical analysis

The Kolmogorov–Smirnov test was used to evaluate whether the distribution of continuous variables were normal. Comparisons between two groups of normally distributed independent variables were analyzed using Student's *t*-test, and descriptive statistics of normally distributed variables are shown as the mean ± s.d. Comparisons between two groups of non-normally distributed independent variables were analyzed using the Mann–Whitney *U*-test, and descriptive statistics are presented as the median (25–75 percentiles). Spearman's correlation analysis was used to assess the correlation between variables. *P*-values below 0.05 were considered to be statistically significant.

RESULTS

The mean age and BMI were 38.43 ± 1.65 and 29.76 ± 1.89, respectively. The mean total FSFI score was 25.344 ± 6.52, and 44.4% of patients were diagnosed with SD using a cutoff FSFI total score of < 26.55. SD was not correlated with age, BMI, BDI or duration of complaints. Moderate inverse correlations were found between total FSFI score and PSQI ($r=-0.434$, $P=0.001$), FIQ score ($P=-0.372$, $P=0.006$) and Short Form 36 ($P=-0.523$, $P=0.000$). There was a moderate positive correlation between total FSFI score and the tender points count ($r=0.480$, $P=0.000$) (Table 1). The mean count of tender points among women with and without SD were 13.88 ± 0.947 and 15.07 ± 1.015, respectively.

PSQI score >5 was considered to be sleep disorder and was detected in 48.1% of patients. There were no significant differences between women with and without sleep disorder in terms of age or BMI. However, the median total FSFI score was significantly lower in patients with sleep disorder (21.4 (18.9–25.3) vs 29.2 (27.2–32.4), $P=0.001$) (Figures 1 and 2). All domains of the FSFI scores were significantly lower in patients with sleep disorder compared with those without sleep disorder (Table 2). In addition, the mean visual analog score was significantly higher (VAS pain: 7.04 ± 1.341 vs 5.46 ± 1.26, $P<0.001$; VAS fatigue: 6.81 ± 1.386 vs 5.64 ± 1.311, $P=0.003$) in women with sleep disorder.

The Beck depression index was positively but poorly correlated with FIQ score, which assesses the severity of disease ($r=0.290$, $P=0.033$). Additionally, patients with longer duration of complaints had a higher FIQ score ($r=0.315$, $P=0.002$). However, neither BDI nor duration of complaints was correlated with all domains of the FSFI.

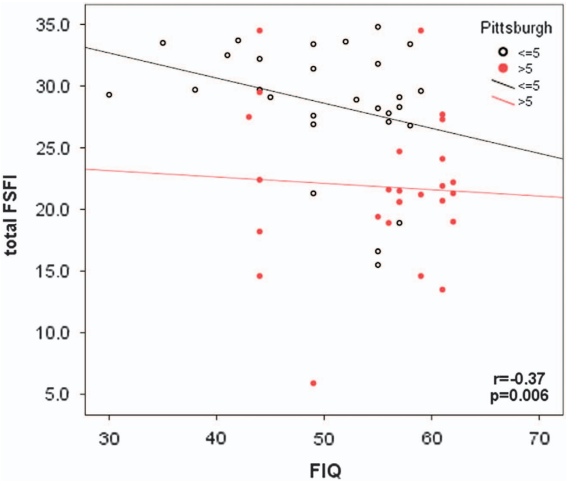

Figure 1. Correlation analysis between fibromyalgia impact questionnaire (FIQ) and total female sexual function index (FSFI) score in fibromyalgia (FM) patients with and without sleep disorder.

DISCUSSION

Impaired sexual function has been previously shown in controlled studies among women with both sleep disorder[8–10] and FM.[14–17] The present study evaluated SD in women with FM and sleep disorder and FM alone, and the data showed that sleep disorder had a negative impact on sexual function in women with FM. The median FSFI scores were 21.4 (18.9–25.3) in patients with sleep disorder and 29.2 (27.2–32.4) in patients without sleep disorder. All domains of the FSFI scores were affected by the sleep disorder.

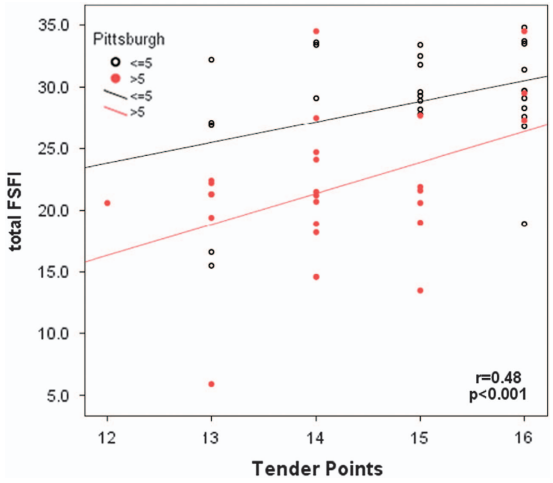

Figure 2. Correlation analysis between number of tender points and total female sexual function index (FSFI) score in fibromyalgia (FM) patients with and without sleep disorder.

Table 2. All domains of the FSFI scores according to sleep quality

	PSQI ⩽ *5*	*PSQI* > *5*	P-*value*
Desire	4.2 (4.2–4.8)	3.6 (3–3.75)	< 0.001
Arousal	4.6 (4.5–5.4)	3.6 (3.0–4.2)	< 0.001
Lubrication	5.4 (4.8–5.6)	3.6 (3.4–4.5)	< 0.001
Orgasm	4.8 (4.4–5.6)	3.6 (3.2–4.1)	< 0.001
Satisfaction	4.8 (4.4–5.8)	3.6 (3.1–4.2)	< 0.001
Pain	5.4 (4.8–6.0)	3.6 (2.4–4.5)	0.001

Abbreviations: FSFI, female sexual function index; PSQI, Pittsburgh sleep quality index.

Recently, published data has investigated predictors of SD in chronic widespread pain including 166 patients and 687 healthy controls.[14] The investigators stated that difficulties with lubrication, sexual pain and distress were the most commonly reported problem, and predictive factors of SD such as relationship dissatisfaction and anxiety were different from those general factors influencing lifelong SD. Usage of psychotropic drugs was found frequently among FM patients with SD[18] This study was concluded by Rico-Villademoros *et al.*[15] and confirmed the higher frequency of SD in women receiving antidepressants compared with aged-matched (< 50) women with FM who were not receiving antidepressants. However, the present study did not include patients who were given drug treatment to eliminate the iatrogenic drug-induced SD. Moreover, supporting our findings, the same study showed that FM affects all dimensions of sexual function.[15]

Another study, by Yilmaz *et al.*,[16] demonstrated that the total FSFI score was significantly inversely correlated with FIQ and BDI scores in women with FM. However, we did not find any correlation between SD and BDI. Similar to our findings, a previous study revealed that major depression had no additional adverse effect on sexual function in women with FM.[17] Nevertheless, in contrast to our study, they did not find any correlations between sleep disturbance and the FSFI score. They found that widespread pain was the only factor that affects sexual function.[17]

High rates of SD have been well documented in women with FM. Rosenbaum[19] claimed that women are more prone to musculoskeletal dysfunction because of mechanical and hormonal changes, and this may have a role in the association between SD and FM. In addition, hypersensitivity and intolerability of tactile and pressure stimuli at tender points may affect sexual activity.[19]

However, interestingly, our results show that the total FSFI score was positively correlated with TPC. Furthermore increased estrogens may provide pelvic stability by softening of ligamentous tissues combined with pelvic floor weakness.[20] On the other hand, autonomic nervous system abnormalities have been previously shown in patients with FM.[21] Sympathetic hyperactivity with downregulation of adrenergic receptors due to chronic stimulation was the main pathology in these patients.

Regardless of FM, sleep disorder itself may cause SD. Stavaras *et al.*[10] demonstrated that severe obstructive sleep apnea was a potential risk factor for SD in premenopausal women. Additionally, they detected decreased progesterone levels in these patients and found that endocrine abnormalities in patients with sleep apnea may play a role in SD.[10] Supporting this finding, sleep cycle disturbance, increased level of stress hormones and hypoxia-induced alterations in the hypothalamo-pituitary axis may deteriorate endocrine rhythms in patients with obstructive sleep apnea and may cause SD.[22,23]

To our knowledge, this study is the first that primarily addressed sleep disorder to assess SD in women with FM. Although no patients had comorbid disease and all were equipped for sexual activity, we did not assess hormonal status, which is a limitation of the current study. Also, owing to existing controlled studies of SD among patients with FM and sleep disorder, we did not need to include healthy control subjects.

CONCLUSION

SD is a common problem and must be evaluated in patients with FM. This study demonstrated that sleep disorder had a negative effect on sexual function and may be the leading cause of SD among women with FM. Therefore, physicians should pay more attention to the evaluation of sleep quality in patients with FM, and the treatment of sleep disorder may improve sexual function.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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