



## RESEARCH ARTICLE

## Evaluation of the Symptoms of Fibromyalgia in Premenopausal Women with Urinary Incontinence

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### Abstract

**Background:** Both urinary incontinence (UI) and fibromyalgia symptoms affect the physical function of women and lead to negative effects on the quality of life and emotional status. Our aim is to identify the prevalence of symptoms of fibromyalgia (FM) in women with UI and the relationships of FM with subtypes of UI.

**Methods:** UI was diagnosed based on clinical histories, gynecologic examinations and urodynamic investigation results. FM was diagnosed according to the 2010 American Community of Rheumatology criteria. The Fibromyalgia Impact Questionnaire (FIQ), a visual analog scale (VAS) evaluation measure, and the Beck Depression Inventory (BDI) were used to evaluate physical functions related to health status and to assess pain, sleep quality and the level of depression in the subjects, respectively. To assess the quality of life of women with UI, we used the urogenital distress inventory short-form (UDI-6) and the incontinence impact questionnaire short-form (IIQ-7).

**Results:** The patient population (n = 94) was composed of consecutive women with stress incontinence (n = 20), urge incontinence (n = 19), and mixed incontinence (n = 21) and a healthy control group without UI (n = 34). Body mass index (BMI), parity, FM frequency, FM tender points, FM symptoms other than fatigue and sicca symptoms, were significantly more frequently found and also scores of VAS, FIQ and BDI, were significantly higher in the women with UI than the control group (p < 0.05).

**Conclusions:** According to the results of our study, symptoms of FM are more prevalent in women with UI, but not related with subtypes of IU. We suggested that IU may trigger FM symptoms due to causing depression and anxiety by disturbing the quality of life in women. But further studies with larger sample sizes will be necessary to confirm these findings.

### Keywords

Urinary incontinence, Stress urinary incontinence, Urge urinary incontinence, Mixed urinary incontinence, Fibromyalgia, Depression

### Introduction

Urinary incontinence (UI) is defined as involuntary urine leakage according to the International Continence Society [1]. Subtypes of IU include stress urinary incontinence (SUI), which is defined by the complaint of the involuntary leakage of urine upon effort, exertion, coughing or sneezing, urge urinary incontinence (UUI); It involves the complaint of a sudden compelling desire to pass urine that is difficult to defer, and mixed urinary incontinence (MUI), which is involuntary leakage associated with urgency and effort, exertion, coughing or sneezing. These subtypes have different pathophysiological mechanisms [1-3]. UI has a profound effect on quality of life, work productivity, sexuality, and emotional status and is associated with increased depression and anxiety [4-6].

Fibromyalgia is a disorder that is characterized by widespread musculoskeletal pain that lasts for at least 3 months [7]. In addition to widespread musculoskeletal pain, several symptoms and comorbidities, such as tiredness, non-restorative sleep, morning stiffness, mood changes, paresthesias, headache, irritable colon syndrome and female urethral syndrome, are often associated with FM [7-10]. Although the etiology

and pathophysiology of FM are not yet understood, the relationship between FM and emotional distress involving depression and anxiety is well known [11-13]. On the other hand; depression and anxiety have been also observed to be important component of UI [14-15]. However, information regarding the relation between UI and FM symptoms is not existent. Therefore, we aimed to evaluate the prevalence of symptoms of FM in women with UI and the association between FM and subtypes of UI in this study.

## Methods

We designed a prospective study that was conducted in a tertiary care hospital after receiving approval from the local ethics committee. The patient population (n = 94) was composed of consecutive women with SUI (n = 20), UUI (n = 19), and MUI (n = 21) and a healthy control group (n = 34) without UI. Study groups were seen between June 2015 and June 2016. All women gave written, informed consent. Premenopausal women aged 30-47 years were enrolled in the study. The exclusion criteria were postmenopausal status, the presence of systemic disorders, including hypertension and diabetes mellitus, serious psychiatric disorders involving psychotic symptoms, recent suicide risk and substance abuse, and/or neurological disease, pregnancy. Healthy premenopausal women assessed for a yearly routine gynaecological evaluation and not complaining of urinary symptoms were accepted to study as a control group. The pertinent demographic data of the women in the study, including age, BMI, education, marital status, parity, profession, smoking, and alcohol use were recorded. Full histories, gynecologic examinations, transvaginal ultrasounds, urinalyses, urine cultures, and neurological examinations were collected upon the women's initial visits, and all gynecologic examinations were performed in the dorsal lithotomy position. SUI, UUI and MUI were diagnosed based on clinical histories, gynecologic examinations and multichannel urodynamic investigation results [16].

FM was diagnosed according to the 2010 American Community of Rheumatology (ACR) criteria.

1. Widespread pain index (WPI) > 7, symptom severity (SS) scale score > 5 or WPI 3-6 and SS scale score > 9.
2. Symptoms have been present at a similar level for at least 3 months.
3. The patient does not have a disorder that would otherwise explain the pain.

WPI is determined by noting the number areas in which the patient has had pain over the last week. Score will be between 0 and 19. The SS scale score is the sum of the severity of the 3 symptoms (fatigue, waking unrefreshed, cognitive symptoms) over the past week plus the extent (severity) of somatic symptoms in general. The final score is between 0 and 12 [17]. Somatic FM symptoms, including fatigue, morning

stiffness, sleep disorder, morning fatigue, paresthesia, headache, Raynaud's phenomenon, irritable bowel syndrome, sicca symptoms, female urethral syndrome, swelling sensations in the tissues and dysmenorrhea, were recorded. VAS evaluation measures were used to assess pain and sleep quality and The Fibromyalgia Impact Questionnaire (FIQ), was used to evaluate the physical functions related to the health statuses of the patients. The FIQ measures physical functioning, work status (missed days of work and job difficulty), depression, anxiety, morning tiredness, pain, stiffness, fatigue and well-being. The total score ranges from 0 to 100, and higher scores indicate more severe symptoms [18]. The validity and reliability of the Turkish version were assessed by Ediz, et al. [19]. The Beck Depression Inventory (BDI) was used to assess the levels of depression of the subjects. It is a 21-item scale that assesses the symptoms and experience of depression. Each item is scored between 0 and 3, and higher scores indicate more severe disease [20]. The validity and reliability of the Turkish version were assessed by Hisli, et al. [21]. To evaluate the quality of life of the women with UI, we used the urogenital distress inventory short-form (UDI-6) and the incontinence impact questionnaire short-form (IIQ-7) among other questionnaires [22]. The UDI-6 consists of six questions related to symptoms such as frequent urination, leakage related to feelings of urgency, leakage related to physical activity, coughing or sneezing, small amounts of leakage (drops), difficulty emptying the bladder, and pain or discomfort in the lower abdominal or genital area. The short form II Q-7 consists of seven questions that are representative of the long form, and this instrument measures the influences of UI on physical activity, social relationships, travel, and emotional health. The validity and reliability of the Turkish version were assessed by Cam, et al. [23].

The statistical analyses were performed with SPSS 15.0 for Windows. Descriptive measures are presented as percentages of the average ranges and means. Compliances with normal data distributions were checked with Kolmogorov-Smirnov tests. One-way ANOVA tests were used to compare the continuous variables (scores). Pearson's chi-square/Fisher's Exact test were used to compare the proportions. The results were evaluated considering at the significance level of  $p < 0.05$ .

## Results

A total of 94 women met the inclusion criteria. The women were divided into the following four groups: SUI (n = 20, 21.3%), UUI (n = 19, 20.2%), MUI (n = 21, 22.3%), and control (n = 34, 36.2%). The demographic characteristics of the patients in terms of age, BMI, education, marital status, parity, profession, smoking and use of alcohol are displayed in Table 1. No statistically significant differences were observed in terms of the mean age, smoking and alcohol use ( $p > 0.05$ ). The BMI and parity

**Table 1:** Comparison of demographic characteristics of the study groups.

	<b>SUI</b> <b>n = 20 (21.3%)</b> <b>mean ± SD</b>	<b>UUI</b> <b>n = 19 (20.2%)</b> <b>mean ± SD</b>	<b>MUI</b> <b>n = 21 (22.3%)</b> <b>mean ± SD</b>	<b>Control</b> <b>n = 34 (36.2%)</b> <b>mean ± SD</b>	<b>P value</b>
Age (year) <sup>b</sup>	42.15 ± 5.5	41.2 ± 5.7	41.3 ± 3.5	39.3 ± 4.7	0.13
BMI <sup>b</sup>	29.4 ± 5.5	28.9 ± 4.1	31.3 ± 5.8	24.7 ± 3.8*	0.001*
Education <sup>a</sup>					0.001*
Elementary school	17 (85)	16 (84.2)	16 (80)	7 (20.6)	
High school university	3 (15)	3 (15.8)	4 (20)	27 (79.4)*	
Marital status <sup>a</sup>					0.005*
Married	18 (90)	19 (100)	18 (90)	24 (70.6)	
Single	2 (10)	0 (0)	2 (10)	10 (29.4)*	
Parity <sup>b</sup>	2.5 ± 0.9	2.5 ± 0.9	2.4 ± 1	1.1 ± 1*	0.001*
Status of employment <sup>a</sup>					0.001*
Non-employment	16 (80)	13 (68.4)	13 (65)	3 (8.8)*	
Employment	4 (20)	6 (31.6)	7 (35.0)	31 (91.2)*	
Smoking <sup>a</sup>	8 (40)	4 (21.1)	9 (45)	9 (26.5)	0.302
Alcohol <sup>a</sup>	0 (0)	0 (0)	1 (5)	1 (2.9)	0.630

<sup>a</sup>Chi-square and; <sup>b</sup>One-way-ANOVA tests were used for the statistical analysis; \*p < 0.05, significantly different groups. SUI: stress urinary incontinence; UUI: urge urinary incontinence; MUI: mixed urinary incontinence; BMI: body mass index.

**Table 2:** Comparisons of the frequency of FM, FM symptoms, scores of VAS, FIQ, BDI, IIQ-7 and UDI-6 between the study groups.

	<b>SUI</b> <b>n = 20 (21.3%)</b> <b>mean ± SD</b>	<b>UUI</b> <b>n = 19 (20.2%)</b> <b>mean ± SD</b>	<b>MUI</b> <b>n = 21 (22.3%)</b> <b>mean ± SD</b>	<b>Control</b> <b>n = 34 (36.2%)</b> <b>mean ± SD</b>	<b>P value</b>
Fatigue <sup>a</sup>	17 (85)	18 (94.7)	18 (90)	23 (67.6)	0.05
Morning stiffness <sup>a</sup>	13 (65)	12 (63.2)	15 (75)	12 (35.3)*	0.019*
Sleep disorder <sup>a</sup>	17 (85)	13 (68.4)	15 (75)	12 (35.3)*	0.001*
Morning fatigue <sup>a</sup>	19 (95)	15 (78.9)	19 (95)	20 (58.8)*	0.003*
Paresthesia <sup>a</sup>	12 (60)	13 (68.4)	17 (85)	3 (8.8)*	0.001*
Headache <sup>a</sup>	14 (73.7)	16 (84.2)	13 (65)	14 (41.2)*	0.013*
Raynaud's phenomenon <sup>a</sup>	4 (20)	4 (21.1)	9 (45)	4 (11.8)*	0.043*
Irritable bowel syndrome <sup>a</sup>	9 (45)	9 (47.4)	12 (60)	7 (20.6)*	0.025*
Sicca symptoms <sup>a</sup>	7 (35)	4 (21.1)	8 (40)	5 (14.7)	0.14
Female urethral syndrome <sup>a</sup>	14 (70)	15 (78.9)	18 (90)	2 (5.9)*	0.001*
Swelling sensation in the tissues <sup>a</sup>	9 (45)	8 (42.1)	14 (70)	6 (17.6)*	0.002*
Dysmenorrhea	14 (70)	9 (47.4)	13 (65)	5 (14.7)*	0.001*
FM tender points <sup>b</sup>	6.9 ± 5.2	5.8 ± 4.3	9 ± 5.1	3.6 ± 3.8*	0.001*
FM frequency(n) <sup>b</sup>	6 (30)	3 (15.8)	7 (35)	1 (2.9)*	0.012*
VAS pain <sup>b</sup>	4.1 ± 3.3	4.7 ± 3.2	5.7 ± 3.1	2.6 ± 2.6*	0.003*
VAS sleep quality <sup>b</sup>	4.8 ± 3	4.7 ± 3.4	5.7 ± 3.7	4.1 ± 3.3	0.39
FIQ <sup>b</sup>	47.8 ± 17.1	39.2 ± 19.3	46.7 ± 19.7	26.6 ± 17.6*	0.001*
BDI <sup>b</sup>	19.4 ± 8.6	17.3 ± 8.5	18.1 ± 11.5	9.2 ± 7.7*	0.001*
IIQ-7	38.9 ± 18.6	54.1 ± 24.9	63.4 ± 21.6*		0.003*
UDI-6	65.7 ± 18.2	55.6 ± 20.3	76.7 ± 16.1*		0.003*

<sup>a</sup>Chi-square and; <sup>b</sup>One-way-ANOVA were used for the statistical analyses; \*p < 0.05, significantly different group. SUI: stress urinary incontinence; UUI: urge urinary incontinence; MUI: mixed urinary incontinence; FM: fibromyalgia; ACR: American Community of Rheumatology; VAS: visual analog scale; FIQ: fibromyalgia impact questionnaire; BDI: beck depression inventory; UDI-6: urogenital distress inventory short-form; IIQ-7: incontinence impact questionnaire short-form.

were significantly higher among the women with UI compared with the control group (p < 0.05). The education level was significantly higher in the control group compared with the women with UI (p < 0.05). Comparisons of the frequency of FM, FM symptoms, scores of VAS, FIQ, BDI, IIQ-7 and UDI-6 between the study groups are shown in Table 2. The FM symptoms, including morning stiffness, sleep disorder, morning fatigue, paresthesia, headache, Raynaud's phenomenon, irritable bowel syndrome, female urethral syndrome, swelling sensations in

the tissues, FM tender points and dysmenorrhea but not fatigue, sicca symptoms, were found to be significantly higher frequency, and also FM prevalence, scores of VAS pain, FIQ, and BDI were detected to be significantly higher in the women with UI compared with the control group (p < 0.05). However, VAS sleep quality was not found to be significantly different (p = 0.394). The scores for the IIQ-7 and UDI-6 were significantly higher in the women with MUI compared to the SUI and UUI groups (p = 0.003, p < 0.05).

## Discussion

The main study result is that most of symptoms of FM are more prevalent in women with UI compared with continent women. When the literature was examined, the relationship between the two conditions of FM and UI and the effect of this relationship on depression, anxiety and impairment in the quality have not been studied so far. Because our study is the first research on this issue, the study results may be important for general women's health. Despite numerous studies that have investigated the etiopathogenesis of FM, the etiology has not yet been fully revealed, and it remain a chronic pain syndrome [24]. FM symptoms, including morning stiffness, sleep disorder, morning fatigue, paresthesia, headache, Raynaud's phenomenon, irritable bowel syndrome, female urethral syndrome, swelling sensations in the tissues and dysmenorrhea, were more frequently found in incontinent group in our study. Each of these symptoms reduces the functional activity of the patients and negatively affects the quality of life in different manners that are similar to those of women with UI [4-6,24,25].

The frequencies of FM, scores of VAS pain, and FIQ were found to be higher in the women with UI compared with the continent group. Depression, which was accompanied by anxiety in most of these patients, is one of the most frequent psychiatric problems associated with FM and may either initiate or worsen the characteristic symptoms of FM [12,13]. We also found that the BDI score was higher among the incontinent groups. These results indicate that UI is a stressful health problem with a negative effect on the quality of life. Deteriorations in the quality of life may be related to higher rates of depression among women with UI [4-6,14,15]. Although to date, the association between FM and IU remains undetermined, UI may cause depression and anxiety by disturbing the quality of life and may trigger FM symptoms. This relationship may cause vicious cycle in both diseases, especially in FM. It is clear those investigations of the factors, such as UI, which affect and trigger FM symptoms and contribute to the pathogenesis of FM, should be conducted.

At the same time, we used the UDI-6 and the IIQ-7 to determine the quality of and distress to life, the scores on these instruments were significantly higher in MUI group. Subtypes of incontinence have different pathophysiologies [1-3]. SUI can occur with the rise of intraabdominal pressure due to urethral hypermobility and defective pelvic floor anatomy, whereas UUI is a condition caused by reduced bladder capacity because of detrusor instability. Since MUI is defined as the combination of SUI and UUI, MUI could have frequent and complicated symptoms including deterioration of life and distress [6].

BMI and parity were found to be important risk

factors for all UI subtypes, and these findings are similar to those of many other studies [26-30]. Although It is not known exactly why obesity causes incontinence, epidemiological studies find out that obesity is an important and independent risk factor for UI. Since weight loss is effective to reduce the UI, it should be considered a first-line treatment in this patient population [26-27]. Parity is also another risk factor clearly associated with UI. This is most likely due to the deformation of the pelvic floor muscles during pregnancy or delivery [28-30].

Our study limitation is the small number of sample size. Studies based on larger numbers of patients are needed to confirm these findings.

## Conclusion

UI in women is known to negatively affect many aspects of their quality of life and emotional status. Although the etiopathogenesis of FM has not been fully elucidated, this condition is known to be closely related to emotional instability, such as depression and anxiety. According to the results of our study, symptoms of FM are more prevalent in women with UI, but not related with subtypes of IU. We suggested that UI may trigger FM symptoms due to causing depression and anxiety by disturbing the quality of life in women. Therefore, clinicians dealing with urogynecology should be aware of the relation between FM and UI. In this case; our findings may be useful to take attention of general women's health problems.

## Conflict of Interest

None.

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