

# Prevalence of Fibromyalgia in Hemodialysis Patients

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This study sought to determine the prevalence of fibromyalgia syndrome and to identify whether fibromyalgia was associated with various clinical symptoms and laboratory parameters in hemodialysis patients. One hundred and forty-eight hemodialysis patients were examined for fibromyalgia symptoms according to the American College of Rheumatology criteria. Demographic characteristics, as well as causes of kidney failure, dialysis duration, and symptoms related to fibromyalgia were investigated. Of 148 patients, 18 (12.2%) were diagnosed with fibromyalgia. Patients with fibromyalgia had significantly poorer sleeping satisfaction than the control group ( $P = .02$ ). The Beck Depression Inventory score was higher in 77.8% of the fibromyalgia patients than that in the control group ( $P = .006$ ), but there was no significant difference in the anxiety score between the two groups ( $P = .86$ ). In conclusion, there was a higher prevalence of fibromyalgia in hemodialysis patients than previously reported. Sleep disturbances and depression levels correlated with fibromyalgia.

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Fibromyalgia is a condition characterized by high levels of pain, sleep disturbance, and fatigue combined with a general increase in medical symptoms including problems of memory or thinking and often psychologic distress.<sup>1</sup> Primary fibromyalgia is idiopathic, whereas secondary fibromyalgia may occur following other conditions such as rheumatoid arthritis, ankylosing spondylitis, surgery, spinal trauma, or stress.<sup>1-3</sup> The most accepted criteria for diagnosis of fibromyalgia has been established by the American College of Rheumatology in 1990 on the basis of a history of chronic widespread pain in 11 or more of 18 tender points for more than 3 months. In 2010, the American College of Rheumatology performed a multicenter study in order to develop simple, practical criteria for clinical diagnosis of fibromyalgia that do not require a tender point examination. Based on this preliminary diagnostic criteria, diagnosis of fibromyalgia is possible on the basis of a widespread pain index score of 7 and

greater and a symptom severity scale score of 5 and greater or a widespread pain index score between 3 and 6 and a symptom severity scale score of 9. Symptoms must be present at a similar level for at least 3 months and the patient should not have a disorder that would otherwise explain the pain.<sup>4</sup> The prevalence of fibromyalgia varies between 4.7% and 13.2%.<sup>4</sup> In the WHO-ILAR-COPCORD study, fibromyalgia prevalence was estimated to be about 0.06% in Iran.<sup>5</sup>

The impact of fibromyalgia on quality of life has been poorly investigated in hemodialysis patients from specific populations. This study aimed to determine the frequency of fibromyalgia in patients with hemodialysis and its associated symptoms as well as to determine its correlation with demographic and clinical characteristics.

In a cross-sectional study, all hemodialysis patients who were admitted to the Rasul Akram Hospital, Tehran, and Shahid Mohammadi Hospital, Bandar Abbas, Iran, in 2010 were enrolled

(148 patients; 84 men and 64 women; mean age, 52.5 ± 17.3 years). They were on hemodialysis for at least 3 months and older than 16 years old and did not have collagen vascular disease, liver disease, or malignancies. Differential diagnosis was performed and patients with chronic fatigue syndrome following viral diseases, hyperparathyroidism, electrolyte disturbances following chronic renal failure, osteomalacia, diabetes mellitus, acute infections, or limb ischemia after hemodialysis were excluded. All of the patients were carefully examined and diagnosis of fibromyalgia was performed according to the American College of Rheumatology criteria. Patients who were not diagnosed with fibromyalgia were considered as the control group. They were comparable with the patients with fibromyalgia in terms of age and sex distribution.

The levels of liver enzymes, parathyroid hormone, and other blood parameters were also determined (Table 1). The Fibromyalgia Impact Questionnaire was used to assess the current health quality of patients with fibromyalgia. The Beck Depression Inventory and the Cattle Anxiety Inventory were used to evaluate depression and anxiety. The hemodialysis adequacy was assessed by monitoring urea kinetics (KT/V). The study was approved by the institutional ethics committee and conducted in accordance with the Declaration of Helsinki. Written informed consents were obtained from the individuals in both groups before they were subjected to investigation.

The mean duration of dialysis was 27.91 ± 57.12 months (ranging, 3 to 312 months). The etiology of the kidney failure was diabetes mellitus in 55 patients (37.2%), hypertension in 48 (32.4%), urinary tract infection in 7 (4.7%), glomerulonephritis in 3 (2.0%), polycystic kidney disease in 5 (3.4%), urinary calculus in 5 (3.4%), and idiopathic in 25 (16.9%). Seventy-three patients would undergo hemodialysis in the morning, 50 in the afternoon, and 25 during the night. Twenty-four patients were single (16.2%) and 124 (83.8%) were married.

Eighteen of 148 hemodialysis patients (12.2%) were diagnosed with fibromyalgia. There was not any significant difference between demographic characteristics of the two groups. The mean age in the fibromyalgia and control groups was 56.6 ± 15.1 years and 52.7 ± 16.7 years, respectively. No significant differences were observed in the

Table 1. Sleep Quality in Hemodialysis Patients With and Without Fibromyalgia

Sleep Disturbance Severity	Falling Asleep Satisfaction		Sleep Quality Satisfaction		Awaking From Sleep		Daytime Sleepiness		P
	Fibromyalgia Group	Control Group	Fibromyalgia Group	Control Group	Fibromyalgia Group	Control Group	Fibromyalgia Group	Control Group	
Normal	0	16 (13.9)	0	11 (9.6)	1 (5.6)	13 (11.3)	1 (5.6)	20 (17.4)	.64
Slight trouble	7 (38.9)	34 (29.6)	0	52 (45.2)	8 (44.4)	54 (47.0)	6 (33.3)	44 (38.3)	
Moderate trouble	3 (16.7)	28 (24.4)	7 (38.9)	2 (11.1)	6 (33.3)	21 (18.3)	6 (33.3)	26 (22.6)	
High trouble	5 (27.8)	26 (22.6)	9 (50.0)	2 (11.1)	2 (11.1)	18 (15.6)	4 (22.2)	19 (16.5)	
Very high trouble	3 (16.7)	11 (9.6)	2 (11.1)	2 (11.1)	1 (5.6)	9 (7.8)	1 (5.6)	5 (4.4)	
									.30
									.37

duration of dialysis and dialysis adequacy index (KT/V) between the two groups. Except for parathyroid hormone level, there were not any significant differences in laboratory parameters between the two groups.

The Fibromyalgia Impact Questionnaire score in fibromyalgia patients ( $39.05 \pm 23.35$ ) was significantly higher than that in the control group ( $20.86 \pm 19.10$ ;  $P = .001$ ). The quality of sleep was investigated in both groups. The sleeping duration in fibromyalgia patients was  $4.36 \pm 1.6$  hours, compared with  $6.56 \pm 2.27$  hours in the control group ( $P = .001$ ). Table 1 summarizes the sleep disturbances in both groups. The Beck Depression Inventory and the Cattle Anxiety Inventory were used to assess the depression and anxiety status in both fibromyalgia and control groups, respectively. The depression scores for fibromyalgia and control groups were  $20.06 \pm 6.38$  and  $16.85 \pm 11.02$ , respectively ( $P = .23$ ; Table 2). The anxiety scores for fibromyalgia and control groups were  $41.72 \pm 10.65$  and  $38.14 \pm 10.97$ , respectively ( $P = .20$ ; Table 2).

Rheumatologic disorders are very common in patients with chronic kidney disease, and the majority of hemodialysis patients suffer a varying range of widespread musculoskeletal discomforts, including fibromyalgia. The current study has provided further insights into the prevalence of fibromyalgia in patients undergoing hemodialysis in the Iranian population. The results showed that 18 of 148 hemodialysis patients (12.2%) were suffering from fibromyalgia. To the best of our knowledge, this is the first study investigating the frequency of fibromyalgia in hemodialysis patients in an Iranian population and the prevalence appears to be higher than the rates reported from other countries, varying from 3.9% to 7.4%,<sup>6,7</sup> though in agreement with these studies, there was no correlation between the fibromyalgia incidence and the average age of the patients.

Consistent with other studies,<sup>8-10</sup> diabetes mellitus and high blood pressure were found to be the

main causes of ESRD in our study. In our study, 66.7% of fibromyalgia patients were female and sex had a significant association with fibromyalgia occurrence as shown previously ( $P = .04$ ). Similar gender association with fibromyalgia has been shown to be up to 83%.<sup>6</sup> Similar to the previous studies,<sup>7</sup> no link was found between the duration of dialysis and the incidence of fibromyalgia. The dialysis adequacy index in fibromyalgia patients was found to be similar to the control group. The levels for liver enzymes, serum albumin, calcium, phosphorus, hemoglobin, hematocrit, triglyceride, and ferritin were not significantly different between the two groups. These parameters are not expected to change in fibromyalgia patients, but they are usually examined to help to differentiate other clinical diseases.

The association between fibromyalgia and hyperparathyroidism has been investigated previously and it has been shown that the increased activity of the parathyroid glands (hyperparathyroidism) can cause symptoms similar to fibromyalgia. Furthermore, higher rates and longer duration of generalized bone or muscle pains, which is associated with low 25-hydroxyvitamin D levels, is often diagnosed as fibromyalgia.<sup>6,11-14</sup> In the current study, plasma parathyroid hormone levels in the fibromyalgia patients were significantly higher than the control group ( $449.16 \pm 479.56$  pg/mL versus  $229.11 \pm 237.30$  pg/mL;  $P = .002$ ). It seems possible because both problems are common in these patients. Further investigations are required to better understand the correlation between fibromyalgia and high parathyroid hormone level in end-stage renal disease patients.

A strong association between fibromyalgia and sleep disturbance was observed in this study, and it remained evident after adjustment for sex, age, and hemodialysis duration. This finding replicates earlier results.<sup>15,16</sup> In fibromyalgia patients, a central nervous system dysfunction associated

**Table 2.** Anxiety and Depression Scores in Hemodialysis Patients With and Without Fibromyalgia

Severity of Symptom	Cattle Anxiety Inventory		P	Beck Depression Inventory		P
	Fibromyalgia Group	Control Group		Fibromyalgia Group	Control Group	
Normal	7 (38.9)	53 (46.1)	.86	4 (22.2)	50 (43.5)	.006
Moderate	3 (16.7)	19 (16.5)		2 (11.1)	21 (18.3)	
Severe	3 (16.7)	20 (17.4)		11 (61.1)	25 (21.7)	
Most severe	5 (27.8)	22 (19.1)		1 (5.6)	19 (16.5)	

with sleep and mood disorders is common.<sup>15,17-19</sup> Fibromyalgia patients are often at increased risk for major depression, and in this study, the Cattle and Beck questionnaires were used to assess the depression and anxiety levels in fibromyalgia patients undergoing hemodialysis compared to those with no fibromyalgia. Fibromyalgia was found to be an independent risk factor for depression in the current study. No significant difference was shown in the levels of the anxiety between the two groups of the patients. This finding is in contrast to the results from another study, which found a significantly higher anxiety level in fibromyalgia patients.<sup>6</sup>

Recruitments for the current study were from two centers in Iran. For estimation of the prevalence of fibromyalgia in Iranian hemodialysis patients, we recommend a larger multicenter study with a larger number of participants.

#### CONFLICT OF INTEREST

None declared.

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