RESEARCH ARTICLE / Araştırma Makalesi

Fibromyalgia Syndrome in Patients Undergoing Peritoneal Dialysis and Hemodialysis

Periton Diyalizi ve Hemodiyaliz Alan Hastalarda Fibromyalji Sendromu

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Abstract

Aim Fibromyalgia is a soft-tissue rheumatism characterized by fatigue, memory problems and widespread pain, and is present in approximately 2-8% of the general population. Information on specific populations related to fibromyalgia is limited. Our aim is to evaluate the clinical, laboratory parameters and fibromyalgia frequency in patients receiving peritoneal dialysis, hemodialysis, and control group.
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Methods Thirty healthy adults (9 female, 21 male, mean age 52.9±16.3 years), 26 patients (7 female, 19 male, mean age 53 ± 15.9 years) undergoing peritoneal dialysis, and 33 patients (11 female, 22 male, mean age 64.5±7.1 years) undergoing hemodialysis were included in the study. 1990 American College of Rheumatology (ACR) criteria and 2011 modified ACR preliminary diagnostic criteria were used for the diagnosis of fibromyalgia. Gender, age, renal function tests, electrolytes, parathyroid hormone, renal failure etiology, and dialysis duration were recorded.

Results There was a statistically significant difference between healthy adults and both dialysis groups in terms of renal function tests and electrolytes ($p < 0.001$). Patients receiving peritoneal dialysis had lower incidence of fibromyalgia compared to hemodialysis group. There was no statistically significant difference in fibromyalgia, depression and cognitive functions between peritoneal dialysis group and healthy group.

Conclusion Patients receiving peritoneal dialysis have a lower incidence of fibromyalgia. This may be related to active participation in treatment, less stress factor, and better protection of renal functions.

Keywords fibromyalgia; renal insufficiency; peritoneal dialysis; hemodialysis

Öz

Amaç Fibromiyalji yorgunluk, hafıza problemleri ve yaygın ağrı ile karakterize bir yumuşak doku romatizması olup genel popülasyonunyaklaşık%2-8'inde bulunmaktadır. Fibromiyalji ile ilgili olarak belirli popülasyonlardaki bilgiler sınırlıdır. Bizim amacımız, periton diyalizi, böbrek diyalizi alanhastalar ve kontrol grubunda klinik, laboratuvar parametreleri ve fibromiyalji sıklığının değerlendirilmesidir.
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Yöntem Çalışmaya, kontrol grubu olarak 30 sağlıklı yetişkin (9 kadın, 21 erkek, ortalama yaş 52,9±16,3 yıl), periton diyalizi alan 26hasta (7 kadın, 19 erkek, ortalama yaş 53±15,9 yıl), ve hemodiyaliz diyaliz alan 33 hasta (11 kadın, 22 erkek, yaş ortalaması 64,5±7,1 yıl) alındı. Fibromiyalji tanısı için 1990 American College of Rheumatology (ACR) kriterleri ile 2011 modifiye ACR preliminary tanı kriterleri kullanıldı. Cinsiyet, yaş, böbrek fonksiyon testleri, elektrolitler, paratiroid hormon, böbrek yetmezlik etyolojisi ve diyaliz süresi kaydedildi.

Bulgular Sağlıklı yetişkinler ile her iki diyaliz grubu arasında, böbrek fonksiyon testleri ve elektrolitler açısından istatistiksel olarak anlamlı farklılık vardı ($p<0.001$). Hemodiyaliz grubuna göre periton diyalizi alan hastalarda fibromiyalji sıklığı daha düşüktü. Periton diyaliz grubu ile sağlıklı grup arasında fibromiyalji, depresyon ve bilişsel işlevler açısından istatistiksel olarak anlamlı farklılık yoktu.

Sonuç Periton diyalizi alan hastalarda fibromiyalji sıklığı daha azdır. Bu durum, tedaviye aktif olarak katılma, daha az stres faktörü ve böbrek fonksiyonlarının daha iyi korunması ile ilişkili olabilir.

Anahtar Kelimeler fibromiyalji; böbrek yetmezliği; periton diyalizi; hemodiyaliz

Introduction

Fibromyalgia is one of the most common disorders of rheumatology clinics, affects 2-8% of the population from age 20 to 55 years with the female predominance.[1-2] It is characterized by sleep disorders, chronic widespread pain, fatigue, mood problems such as depression or anxiety, tension or migraine type headache. Physical or emotional trauma can trigger the symptoms of fibromyalgia, and the quality of life, social functions are affected negatively.[3]

The pathogenesis of fibromyalgia is not clearly understood. Substance P, serotonin, nociceptive, sympathetic, autonomic nervous system and hypothalamic-pituitary-adrenal axis dysregulation are suspicious factors in pathogenesis.[4] Recently, some authors showed the inflammatory response in patients with fibromyalgia.[5] Both of genetic predisposition and environmental factors such as infections (Epstein-Barr virus, hepatitis C virus, parvovirus, Lyme disease, etc.), connective tissue disease, obstructive sleep apnea syndrome, chronic kidney disease, and diabetes mellitus may be associated with fibromyalgia.[6,7]

Chronic kidney disease cause psychiatric symptoms, degradation in the quality of life, and affects daily life activities.[8,9] Diabetes mellitus, hypertension, glomerulonephritis, polycystic kidney disease, interstitial nephritis, and disorders of the urinary tract may lead to kidney failure. Hemodialysis and peritoneal dialysis are used as renal replacement treatments for impaired renal function. Dialysis is an important factor that affects life quality and comfort. Especially, poor quality of life was reported in patients undergoing hemodialysis compared with the general population.[10] Peritoneal dialysis supports independence and flexible lifestyle to patients with renal insufficiency. Also, there is no dependence on the dialysis unit and the patients may undergo replacement therapy while sleeping. Because of these characteristics, there may be the higher quality of life and less incidence of fibromyalgia compared with patients receiving hemodialysis.

There is limited information on fibromyalgia in specific populations, such as patients receiving peritoneal dialysis. Therefore, we aim to analyzed fibromyalgia, clinical and laboratory features of patients undergoing peritoneal dialysis and compared them with hemodialysis patients and healthy controls.

Materıals And Methods

Thirty control subjects (21 males, 9 females, mean age of 52,9±16,3 years) and 26 patients (7 females, 19 males, mean age of 53±15,9 years) receiving peritoneal dialysis aged between 24 and 76 years were enrolled to the study. Control group were selected from healthy subjects without a history of fibromyalgia, renal insufficiency, and documented to have normal renal function. And, thirty-three patients (22 males, 11 females, mean age of 64,5±7,1 years) receiving hemodialysis were enrolled in this study.

The aim and the content of the study were explained to all patients and the written consent document was obtained. This is a monocenter descriptive survey study. Our study was approved by the ethics committee of our university (approval number:2016/892). The following parameters were evaluated: age, gender, causes of renal insufficiency, dialysis duration, the level of parathyroid hormone (PTH), renal function tests and electrolytes. Fibromyalgia was diagnosed with the criteria of 1990 American College of Rheumatology (ACR) and 2011 modification of the ACR preliminary

diagnostic criteria. The individuals with tenderness in 11 or more of 18 tender points by digital palpation (1990 ACR), and score above 13 points (0-31 point) (2011 ACR) were evaluated as FMS.[11,12] Cognitive functions were determined by using the following scale: 0 = No problem; 1 = Slight or mild problems; generally mild or intermittent; 2 = Moderate; considerable problems; often present and/or at a moderate level; 3 = Severe: pervasive, continuous, life-disturbing problems[12]. The single-item depression questionnaire that is significantly associated with the SF-36 mood and mental component summary score was used to define self-reported depression.[12,13]

All data were recorded and statistical analyses were performed by using SPSS statistical package, version 18.0. The Mann-Whitney test was used to compare the differences between the two groups, and the Chi-square test was used for categorical comparisons. The Spearman correlation test was used for the association between the two variables. All results were given as mean±standard deviation or median, while categorical variables with the percentage. $p<0.05$ was considered statistically significant.

Results

The mean age of the peritoneal dialysis group was 53±15.9 years, it was 64,5±7,1 years for hemodialysis group, and 52,9±16,3 years for the healthy group. The etiology of renal insufficiency was hypertension in 10 (38,5%), glomerulonephritis in 4 (15,4%), diabetes mellitus in 3 patients (11,5%), polycystic kidney disease in 1 (3,8%), pyelonephritis in 1 (3,8%), nephrolithiasis in 2 (7,7%), and idiopathic in 5 (19,2%) in patients receiving peritoneal dialysis. Renal insufficiency etiology in both of peritoneal dialysis and hemodialysis group are shown in Table 2.

Table 1. Clinical characteristics of peritoneal dialysis, hemodialysis and healthy group

	Peritoneal Dialysis (n:26)	Hemodialysis (n:33)	Healthy group (n:30)
Age (years)	53±15,9	64,5±7,1	52,9±16,3
Gender (F/M)	7/19	11/22	9/21
Fibromyalgia	3,8%	12,1%	3,3%
Cognitive Symptoms	7,6%	27,3%	6,6%
Depression	7,7%	12,1%	6,7%

Table 2. The etiology of renal failure in patients receiving peritoneal dialysis and hemodialysis

CKD etiology	Peritoneal Dialysis (n:26)	Hemodialysis (n:33)
Diabetes mellitus	3 (11,5%)	10 (30,3%)
Hypertension	10 (38,5%)	14 (42,4%)
Glomerulonephritis	4 (15,4%)	1 (3%)
İdiopathic	5 (19,2%)	6 (18,2%)
Other Causes	4 (15,4%)	2 (6,1%)

Kidney function tests and electrolyte levels were significantly different between both dialysis group compared to healthy group ($p<0,001$). Ionized calcium and phosphorus were higher in patients with fibromyalgia than the control group ($p>0,05$). The laboratory features of all patients and healthy controls are shown in Table 3.

Table 3. Laboratory values of peritoneal dialysis, hemodialysis and control group				
	Peritoneal Dialysis (n:26)	Hemodialysis (n:33)	Healthy group (n:30)	P value*
Urea (mg/dl)	115,2±32,7	106,8±28,7	27±9,5	<0,001
Creatinine (mg/dl)	9,4±3,3	5,0±1,7	0,7±0,1	
Phosphate(mg/dl)	4,9±1,1	4,6±1,4	3,5±0,4	
Parathormone (pg/ml)	611,8±309,9	407±243,3	66,9±25,4	
*compared with hemodialysis and peritoneal dialysis				

Mean duration of dialysis was 50,4±35,1 months for the peritoneal dialysis group. The prevalence of fibromyalgia was lower in peritoneal dialysis group compared to hemodialysis. One (3,8%) patient in the peritoneal dialysis group and %3,3 of healthy subjects and %12,1 patients receiving hemodialysis were diagnosed with fibromyalgia, respectively. All of the patients diagnosed with fibromyalgia were female.

Discussion

The prevalence ratio of fibromyalgia in the general population was reported between 2-8%. Its prevalence varies with sex, age, and co-morbidities, and affected by psychological and demographic features[7]. Females are affected more frequently than males.[1-3] In a study, the prevalence was 3,4% for females, and this rate was found 0,5% for males.[14] Also, it may vary with age as in sex. Although fibromyalgia may develop at any age, it has been reported that the prevalence may increase with aging. And the peak prevalence ratio was found between the ages of 60 to 79 years.[14] Wolfe et al. reported 2% prevalence at age of between 30-39 years, and 7,4% at 70-79 years.[14] Fibromyalgia has been detected more frequently in females older than 60 years (71 years) in patients receiving peritoneal dialysis, and the mean of 67,5±4 years for hemodialysis group. Although the mean age of peritoneal dialysis patients is lower than hemodialysis group, no correlation was found between age and fibromyalgia, in our study. The prevalence was 3,8% for the peritoneal group which was close to the general population.

The rates of fibromyalgia in patients receiving peritoneal dialysis and healthy control groups were similar. No statistical significancewas found between depression and cognitive functions in patients undergoing peritoneal dialysis and healthy group. But, the ratio was higher in patients with hemodialysis compared to peritoneal dialysis and healthy groups. Independence and a flexible lifestyle and may led to these results.

Ankylosing spondylitis, connective tissue diseases such as rheumatoid arthritis, systemic lupus erythematosus, obstructive sleep apnea syndrome, diabetes mellitus, and chronic kidney disease (CKD) with replacement treatment may be associated with fibromyalgia.[6,15] It is an important problem for the rheumatologist, the rate is approximately 11-30% in rheumatology clinics, higher compared with the general population.[6,16]

The relationship between specific population groups such as obstructive sleep apnea, hemodialysis, and pre-dialysis CKD patients.[15-18] Increased fibromyalgia rate was reported in diabetes mellitus. The main causes of renal insufficiency are hypertension and diabetes mellitus. In our study, the etiology and ratio of renal insufficiency of the peritoneal dialysis group are shown in Table 2.

The mean dialysis duration was 50,4±35,1 months for peritoneal dialysis group.

Musculoskeletal problems such as renal osteodystrophy, osteomalacia, osteoporosis, and avascular necrosis are more common in patients with renal insufficiency. Chronic musculoskeletal pain may be associated with calcium, phosphate, uric acids levels, and its imbalance.[19]

Higher serum levels of PTH and calcium were associated with chronic pain in patients with hemodialysis.[20] Fibromyalgia is one of the reasons that cause chronic widespread pain in CKD. Also, higher serum PTH levels may cause similar symptoms with FMS.[15] There was no statistically significant difference between secondary hyperparathyroidism and fibromyalgia in both of the dialysis group. In our study, the level of ionized calcium, phosphorus, and parathormone were higher in patients with fibromyalgia. There were no significant differences for laboratory parameters between both dialysis groups. The demographic and laboratory features are shown in Table 1 and 2.

Renal failure is associated with physical inactivity, decreased quality of life and the morbidity and mortality is increased. Dialysis, especially hemodialysis affects the quality of life, comfort, and cause psychological problems.[8,15,20] In these patients, psychiatric problems such as depression, drug incompatibility, and sexual dysfunction are frequent. The life quality was poor in patients with hemodialysis compared with the general population.[7,8]

The prevalence of fibromyalgia was 3.9% with to higher depression and anxiety in Brazilian hemodialysis patients.[21] In a study from Turkey, higher prevalence (9%) in hemodialysis patients and statistically significant differences in cognitive symptoms between fibromyalgia and non-fibromyalgia groups was reported.[20] In another study, the prevalence was reported as 7,4% with female predominant of 122 hemodialysis patients and it was reported similar rates compared with the control group.[21] Also, depression was correlated with fibromyalgia. According to Samimagham H et al.'s study, 12,2% of 148 hemodialysis patients were suffering from fibromyalgia with higher depression and anxiety levels.[15] In our study, no statistically significant differences in cognitive symptoms and depression were found in peritoneal dialysis group compared to control group. However, depression and cognitive symptom rates of hemodialysis group were higher compared with peritoneal dialysis and the control group.

We have evaluated the clinical, laboratory features and prevalence of fibromyalgia in patients undergoing peritoneal dialysis, and compared them with hemodialysis and healthy group. There are limited reports about fibromyalgia in patients with peritoneal dialysis. The limitation in this research was that of a small sample size of patients. The present study and our findings support the lower prevalence of fibromyalgia compared to hemodialysis patients. It may be connected to actively participate in treatment, fewer stress factors, and better preservation of renal functions compared with hemodialysis. Also, peritoneal dialysis provides patients independence and flexible lifestyle.

1. Branco JC, Bannwarth B, Failde I, Abello Carbonell J, Blotman F, Spaeth M, et al. Prevalence of fibromyalgia: a survey in five European countries. Semin Arthritis Rheum. 2010;39:448-53.
2. Clauw DJ. Fibromyalgia: a clinical review. JAMA. 2014;311:1547-55.
3. Mas AJ, Carmona L, Valverde M, Ribas B; EPISER Study Group. Prevalence and impact of fibromyalgia on function and quality of life in individuals from the general population: results from a nationwide study in Spain. Clin Exp Rheumatol.2008;26:519-26.
4. Jahan F, Nanji K, Qidwai W, Qasim R. Fibromyalgia syndrome: an overview of pathophysiology, diagnosis and management. Oman Med J. 2012;27:192-5.
5. Metyas SK, Solyman JS, Arkfeld DG. Inflammatory Fibromyalgia: Is It Real? Curr Rheumatol Rev. 2015 May 21.
6. Haliloglu S, Carlioglu A, Akdeniz D, Karaaslan Y, Kosar A. Fibromyalgia in patients with other rheumatic diseases: prevalence and relationship with disease activity. Rheumatol Int. 2014 Sep;34:1275-80.
7. Walitt B, Nahin RL, Katz RS, Bergman MJ, Wolfe F. The Prevalence and Characteristics of Fibromyalgia in the 2012 National Health Interview Survey. PLoS One. 2015;10:e0138024.
8. Rebollo Rubio A, Morales Asencio JM, Eugenia Pons Raventos M. Depression, anxiety and health-related quality of life amongst patients who are starting dialysis treatment. J Ren Care. 2017 Feb 27.
9. Moreira JM, Bouissou Morais Soares CM, Teixeira AL, Simões E Silva AC, Kummer AM. Anxiety, depression, resilience and quality of life in children and adolescents with pre-dialysis chronic kidney disease. Pediatr Nephrol. 2015;30:2153-62.
10. Heidari F, Afshari M, Moosazadeh M. Prevalence of fibromyalgia in general population and patients, a systematic review and meta-analysis. Rheumatol Int.2017 Apr 26.
11. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, et al. The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. Arthritis Care Res (Hoboken). 2010;62:600-10.
12. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Häuser W, Katz RS, et al. Fibromyalgia criteria and severity scales for clinical and epidemiological studies: a modification of the ACR Preliminary Diagnostic Criteria for Fibromyalgia. J Rheumatol. 2011;38:1113-22.
13. Wolfe F, Michaud K. Predicting depression in rheumatoid arthritis: the signal importance of pain extent and fatigue, and comorbidity. Arthritis Rheum 2009;61:667-73.
14. Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L. The prevalence and characteristics of fibromyalgia in the general population. Arthritis Rheum. 1995;38:19-28.
15. Samimagham H, Haghighi A, Tayebi M, Jenabi A, Arabi M, Kianmehr N. Prevalence of fibromyalgia in hemodialysis patients. Iran J Kidney Dis. 2014;8:236-9.
16. Azevedo VF, Paiva Edos S, Felippe LR, Moreira RA. Occurrence of fibromyalgia in patients with ankylosing spondylitis. Rev Bras Reumatol. 2010;50:646-50.
17. Tishler M, Smorodin T, Vazina-Amit M, Ramot Y, Koffler M, Fishel B. Fibromyalgia in diabetes mellitus. Rheumatol Int. 2003;23:171-3.
18. Marvisi M, Balzarini L, Mancini C, Ramponi S, Marvisi C. Fibromyalgia is frequent in obstructive sleep apnea and responds to CPAP therapy. Eur J Intern Med. 2015;26:49-50.
19. Golan E, Haggiag I, Os P, Bernheim J. Calcium, parathyroid hormone, and vitamin D: major determinants of chronic pain in hemodialysis patients. Clin J Am Soc Nephrol. 2009;4:1374-80.
20. Leblebici B, Özelsancak R, Yılmaz EE, Doruk P. Fibromyalgia syndrome in Turkish hemodialysis patients. Hemodial Int. 2016;20:106-10.
21. Couto CI, Natour J, Carvalho AB. Fibromyalgia: its prevalence and impact on the quality of life on a hemodialyzed population. Hemodial Int. 2008;12:66-72.
22. Yuceturk TE, Yucel AE, Yuceturk H, Kart-Koseoglu H, Unuvar R, Ozdemir FN, et al. Fibromyalgia: its prevalence in haemodialysis patients and its relationships with clinical and laboratory parameters. Nephrol Dial Transplant.2005;20:2485-8.