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Prevalence and Severity of the Restless Leg Syndrome in Patients with Hip and Knee Osteoarthritis

Kalça ve Diz Osteoartritli Hastalarda Huzursuz Bacak Sendromunun Yaygınlığı ve Şiddeti

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Abstract

Aim: To investigate Restless legs syndrome (RLS) if the prevalence, severity, pain levels, sleep hygiene and quality of life differs hip and knee osteoarthritis (OA).

Material and Method: Between January, 2, 2020- June, 2, 2020, 103 patients with knee OA and 98 with hip OA between 55 and 75 years of age corresponding inclusion and exclusion criteria were recorded. The visual analog scale (VAS) for pain severity, the Lequesne severity index for the severity of OA, the Sleep Hygiene Indes for frequency and severity of RLS symptoms and sleep behaviors, and Nottingham Health Profile (NHP) was used for assessment of overall health.

Results: The RLS symptom severity, the RLS duration, VAS general and at night, sleep hygiene index and NHP sleep, energy and NHP Section 1 and Section 2 parameters were significantly higher in the Knee OA than the hip OA. A strongly positive correlation was detected between RLS severity and RLS duration, Body Mass İndex and Leq Hip scores; however, a poor correlation was detected between night VAS, sleep NHP and physical NHP parameters. A strongly positive correlation was detected between RLS duration and sleep NHP, Leq Knee OA severity, and grade.

Conclusion: It was concluded that in the treatment and follow-up of RLS, it should be aimed to increase the quality of life of the patients by following the treatment of hip and knee osteoarthritis along with weight control of the patients.

Keywords: Restless leg syndrome, sleep, quality of life, pain

Öz

Amaç: Huzursuz bacak sendromunun (HBS) prevalansı, şiddeti, ağrı düzeyleri, uyku hijyeni ve yaşam kalitesinin kalça ve diz osteoartriti (OA) arasında farklılık gösterip göstermediğini araştırmak.

Gereç ve Yöntem: 2 Ocak 2020 - 2 Haziran 2020 tarihleri arasında 55-75 yaşları arasında diz OA'sı olan 103 ve kalça OA'si olan 98 hasta dahil edilme ve dışlama kriterlerine göre kaydedildi. Ağrı şiddeti için visüel ağrı skalası (VAS), OA şiddeti için Lequesne şiddet indeksi, HBS semptomlarının sıklığı ve şiddeti ve uyku davranışları için Uyku Hijyeni İndeksi ve genel sağlığın değerlendirilmesi için Nottingham Sağlık Profili (NSP) kullanıldı.

Bulgular: HBS semptom şiddeti, HBS süresi, VAS genel ve gece, uyku hijyen indeksi ve NSP uyku, enerji ve NSP Bölüm 1 ve Bölüm 2 parametreleri Diz OA'sında kalça OA'ya göre anlamlı olarak daha yüksekti. HBS şiddeti ile HBS süresi,vücut kitle indeksi ve Leq Hip skorları arasında güçlü bir pozitif korelasyon saptandı; ancak gece VAS'ı, uyku NSP'si ve fiziksel NSP parametreleri arasında zayıf bir korelasyon tespit edildi. HBS süresi ile uyku NSP'si, Leq diz OA şiddeti ve derecesi arasında güçlü bir pozitif korelasyon saptandı.

Sonuç: HBS'li hastaların tedavi ve takibinde hastaların kilo kontrolü ile birlikte kalça ve diz OA tedavisinin de göz önünde bulundurularak takip edilmesinin hastaların yaşam kalitelerinin artırılmasına yardımcı olacağı öngürülmektedir.

Anahtar Kelimeler: Huzursuz bacak sendromu, uyku, yaşam kalitesi, ağrı

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INTRODUCTION

Restless legs syndrome (RLS), also known as Willis-Ekbom disease, is a chronic, progressive movement disorder characterized by abnormal sensations caused by the urge or need to move the legs. The patients often express the desire to move the legs, which they cannot prevent, in the form of pain-burning-tingling which is not very painful, but quite uncomfortable. This condition occurs during rest, becomes severe at night, and it usually arouses from sleep, thus causing chronic sleep disorder and emotional stress.[1] Since majority of the patients could not be diagnosed, the incidence of the disease remains unknown. Epidemiological studies reveal that RLS may be detected in 1% to 15% of the society.[2]

The RLS is classified as primary and secondary depending on the etiology. Primary RLS: The primary or idiopathic RLS is the form of RLS without all clinical forms that are known to cause the secondary form. Secondary causes include iron deficiency anemia[3], pregnancy[4], kidney failure[5], endocrine disorders such as diabetes mellitus (DM)[6,7], diseases involving the nervous system such as Multiple sclerosis (MS)[8] and diseases such as rheumatoid arthritis (RA) and fibromyalgia[9,10] with musculoskeletal pain. Osteoarthritis (OA) is a medical condition detected in elder age; almost half of the population over 65 years of age has OA.[11] However, most of the studies examining the association of musculoskeletal system and RLS and sleep quality were conducted on patients with RA.[12,13] Joint limitation, fatigue, functional limitation, RLS along with pain have been investigated; it is also known that impaired sleep may have negative effects on pain, fatigue and psychological state.[14] There is not any study on the association between hip, knee OA and RLS in the literature, and our study is the first in this respect. The aim of the present study was to investigate if the prevalence, severity, pain levels, sleep hygiene and quality of life differs in patients with hip and knee OA.

MATERIAL AND METHOD

This cross sectional study included 103 patients with knee OA and 98 with hip OA between 55 and 75 years of age who have referred Physiotherapy and Rehabilitation Clinic due to knee or hip pain between January, 2, 2020 and June, 2, 2020 and corresponds inclusion and exclusion criteria. [15,16] The study was carried out with the permission of Kafkas Üniversity Ethics Committee (Date: 26.02.2020, Decision No: 80576354-050-099/29). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. All patients included in the study were informed about the study and their written consent was obtained. Patients who were able to answer the questionnaire questions with grade 2, 3 and 4 OA by the Kelgren Lawrence[17] radiological staging system for patients with knee OA and Tonnis[18] for patients with hip OA were included in the study. Exclusion criteria were the patients under 55 and over 75 years of age, patients with cognitive dysfunction, patients using neuroleptic drugs, those with inability to cooperate with the questioning scale, acute/subacute inflammatory/degenerative joint arthritis, MS, spinal myelopathy, stroke in the extremity with RLS, neurological disease such as radiculopathy, peripheral arterial/venous disease, deep vein thrombosis in the last 2 years, history of anemia or blood tests indicating hemoglobin level below 12 g/dl; those diagnosed with Type 1 or Type 2 DM, peripheral neuropathy, bilateral knee or hip OA, or both hip and knee OA on the same extremity; and the patients who have had intra-articular injections of hyaluronic acid or corticosteroids to the knee or hip in the last 1 year. The individuals meeting the inclusion criteria were divided into two groups including 103 individuals with knee OA and 98 individuals with hip OA.

The age, gender, height, body weight, income level, marital status, education level and accompanying diseases of the patients were recorded with the demographic form specifically prepared for the study. The Body Mass Index (BMI) was calculated. Complete blood count, fasting blood sugar, urea and creatinine, c-reactive protein (CRP) values were recorded at the time of admission. A detailed patient history investigation and physical examination of all participants were performed; the range of motion of the lower limbs, the muscle strength assessment, deep tendon reflex examinations, peripheral pulse (femoral, popliteal and dorsalis pedis arteries), sensory examinations were also performed. The Visual Analog Scale (VAS) was used in order to assess the pain severity.[19] The participants were told to mark the most suitable line that indicates their pain level between 0 and 10. Pain without localized diffusion or distribution to the joints, increased with activity and decreased with rest was recorded.

The Lequesne severity index was used in order to detect the OA severity. This index is a scale that includes questions about pain, maximum walking capacity and activities of daily living. Scoring is performed according to the answers given by the patient and the scores range between 0 and 24.[20]

The patients were asked about the 4 basic RLS diagnostic criteria determined by the International RLS Study Group using a face-to-face questionnaire for detection of RLS. [9] Those who have answered "yes" to all four questions were diagnosed with RLS. Patients diagnosed with RLS according to these diagnostic criteria were evaluated with the International Restless Legs Study Group severity questionnaire, which questions the frequency and intensity of symptoms, and their effects on daily life and sleep.[21] According to the scale; scores between 1 and 10 are mild, between 11 and 20 are moderate, between 21 and 30 are severe, and between 31 and 40 are very severe disease.[21]

Sleep hygiene index consisting of 13 questions in a five-point Likert scale was used to question how often the participants performed the sleep behaviors that make up their sleep hygiene. The score range of this scale varies between 13 and 65, and an increase in the score indicates poor hygiene.[22]

The Nottingham Health Profile (NHP) which is used to evaluate the general health status and to measure the physical, social and emotional effects of diseases on individuals was used. This scale consists of 38 questions. These are questions about pain (8 questions), physical activity (8 questions), fatigue (3 questions), social isolation (5 questions), and emotional state (9 questions). The evaluation was done by obtaining the percentage of the answers "yes". Total score varies between 0 and 100.[23]

The mean and standard deviation values were obtained from the reference article in calculating the sample size.[24] In order to reach the study power by 80%, the α value (type 1 error) was accepted as 5%, adding 20% patient loss, and it was calculated that at least 75 patients in each group should be included.

Statistical Analysis

The SPSS for Windows 18.0 statistical package program was used to evaluate the data. The descriptive statistical data was used to define demographic characteristics. Continuous data were expressed as mean±standard deviation (SD), and categorical data were expressed in percent (%). Conformity assessment of the data of the cases with normal distribution was done with the Kolmogorov-Smirnov test. The χ2 and Fisher Exact χ2 test were used in order to compare qualitative data. Mann Whitney U test was used for evaluation of continuous data, since the groups did not present normal distribution in binary group comparisons. Spearman's correlation coefficient was used for correlation analysis. Any p value below 0.05 was accepted as statistically significant.

RESULTS

There was not any statistically significant difference between the groups in terms of age, gender, BMI, education level, income level, occupation, marital status and additional disease among the demographic data evaluated (p|>0.05). A statistically significant difference was found between the two groups in terms of the presence and severity of RLS (p=0.042, p=0.033) (**Table 1**).

A significant difference was detected between the groups for RLS symptom severity (p<0.001), RLS duration (p<0.001), VAS overall (p<0.001) and nighttime (p<0.001), Sleep hygiene index (p=0.002) and NHP sleep (p=0.010), energy (p<0.001) and NHP Part 1 (p<0.001) and Section 2 parameters (p=0.032) (**Table 2**).

A strongly positive correlation was detected between RLS severity and RLS duration, BMI and Leq Hip scores; however, a poor correlation was detected between night VAS, sleep NHP and physical NHP parameters (P<0.001, P<0.05, respectively). A strongly positive correlation was detected between RLS duration and sleep NHP (r=0.259), Leq Knee OA severity (r=0.466), and Kelgren Lawrence grade (r =0.500) (**Table 3**).

Table 1. Demographic data of the participants

	Knee OA (n=103)	Hip OA (n=98)	p*
Age (mean, SD)	66.66±4.67	65.98±4.40	0.42
Gender (n,%)			
Female	69 (67)	60 (61.2)	0.51
Male	34 (33)	38 (38.8)	
BMI (kg/m2)(mean, SD)	29.98±6.38	28.25±5.73	0.31
Education (n, %)			
Illiterate	22 (21.4)	19 (19.4)	0.20
Elementary School	34 (33)	42 (42.9)	
Middle School	31 (30.1)	31 (31.6)	
University and higher	16 (15.5)	6 (6.1)	
Income (n, %)			
Below 3000 TL	55 (52.9)	48 (48.5)	0.66
Above 30000 TL	49 (47.1)	51 (51.5)	
Occupation (n, %)			
Employed	28 (27.2)	24 (24.5)	0.45
Unemployed	75 (72.8)	74 (75.5)	
Marital status (n, %)			
Married	50 (48.5)	49 (50)	0.66
Single	34 (33)	35 (35,7)	
Divorced	19 (18,4)	14 (14.3)	
Concomitant disease (n, %)			
Yes	76 (73.8)	77 (78.6)	0.87
No	27 (26.2)	21 (21.4)	
RLS (n, %)			
Yes	33 (32.03)	41 (41.83)	0.042
No	70 (67.97)	57 (58.17)	
RLS severity classification			
Mild	2(6.06)	13(31.702)	0.033
Moderate	6(18.18)	14(34.14)	
Severe	15(45.45)	9(21.95)	
Very Severe	10(30.30)	5(12.19)	

n: number of patients, %: percentage, BMI: Body Mass Index, RLS: Restless Leg Syndrome,

Table 2. Comparison of Clinical parameters between the groups

	Knee OA + RLS (n=33) (mean, SD) (min-max)	Hip OA + RLS (n=41) (mean, SD) (min-max)	p*
RLS severity	24.29±9.22	19.6±9.71	<0.001
RLS (day)	697.57±584.12	270.48±230.92	<0.001
VAS General	5.39±2.27(0-10)	5.07±2.27(3-8)	<0.001
Night VAS	4.93±2.54(0-10)	4.56±2.13(0-8)	<0.001
Sleep hygiene	44.48±7.71(24-52)	39.04±10.28(16-54)	0.002
NHP emotion	67.27±14.59	57.57±27.75	0.613
NHP pain	72.88±13.06	64.19±19.92	0.300
NHP sleep	66.41±17.05	50.59±21.27	0.010
NHP social	63.06±17.17	60.61±21.67	0.976
NHP physical	64.31±16.7	62.51±21.05	0.480
NHP energy	72.02±14.79	59.4±16.41	<0.001
NHP Section 1	364.75±44.21	342.91±42.42	<0.001
NHP Section 2	5.27±0.91	4.65±2.07	0.032

n: Number of Patients, min: Minimum, max: Maximum, OA:Osteoarthritis, RLS: Restless Leg Syndrome, RLS: Restless Leg Syndrome, VAS: Visual Analog Scale, NHP: Nottingham Health Profile

Table 3. The association between severity and duration of RLS and other parameters

	Corelation Coefficient (rs)***													
	RLS severity	RLS duration	Height	Weight	BMI	VAS General	Night VAS	NHP sleep	NHP physical	NHP Section 1	NHP Section 1	Leq knee OA severity	Leq hip OA severity	Kelgren Lavrence Stage
RLS severity	N/A	0.247**	-0.098	0.258**	0.288**	0.476	0.369*	0.265*	0.277*	-0.045	0.041	0.078	0.440**	0.064
RLS duration	0.247**	N/A	-0.019	0.083	0.101	0.339	0.326	0.259**	0.079	-0.090	-0.014	0,.466**	-0.054	0,.500**

p<0.01, * p<0.05*spearman r, OA:Osteoarthritis, RLS: Restless Leg Syndrome, BMI: Body Mass Index, RLS: Restless Leg Syndrome, VAS: Visual Anolog Scale, NHP: Nottingham Health Profile

DISCUSSION

It was investigated if the prevalence, severity, pain levels, sleep hygiene and quality of life differs in patients with hip and knee OA in this study. We detected that the patients with knee OA has higher RLS duration, symptom severity and pain scores with more deterioration in quality of sleep and daily life activities when compared to those with hip OA. Furthermore, the increase in BMI, OA severity and RLS symptom duration causes an increase in strong pain scores in the severity of RLS, and impairment of sleep quality causes less increase in the severity of RLS.

Among the risk factors for OA, age, higher BMI and presence of additional disease are considered as risk factors in studies.[25-27] A significant correlation was detected between the BMI and RLS severity in this study; therefore, bodyweight control is important in individuals with OA.

Although RLS may be detected in any age, it is observed in previous studies that the prevalence increases along with the age with a prevalence rate between 1.06% and 44%.[28-30] We detected the knee OA prevalence as 32.03% and the hip OA prevalence as 41.83% in our study.

The studies in the literature reveal that the patients with peripheral neuropathic pain and RLS were older and had higher pain scores compared to patients with RLS with OA, according to RLS studies in patients with diabetic peripheral neuropathic pain and OA. No difference was found between the groups in terms of quality of life and sleep parameters.[31] Furthermore, a study conducted in 2012 found that the quality of life in patients with RLS was found to be lower than in the normal population, even lower than patients with diabetes and hypertension, and higher than patients with OA.[32] In our study, it was a disadvantaged group in terms of pain in the OA groups and sleep hygiene in the knee OA group, and this was similar in terms of quality of life.

Unlike our study, a strongly negative correlation was found between RLS symptoms and physical function, bodily pain, and social function scores in a study in which RLS-related quality of life was evaluated in the literature.[33] In a study which investigated the effect of RLS on sleep and quality of life in patients with heart disease, worse sleep and quality of life were found in patients with RLS; RLS was found to be associated with higher sleep and quality of life scores in the multiple regression analysis.[34]

A previous study evaluating the factors associated with RLS in patients with MS found cognitive impairment higher in patients with RLS, and cognitive impairment was found to be associated with sleep quality.[35] The association between RLS-related factors was investigated in our study; and a strongly positive correlation was found between RLS severity and RLS duration, BMI, night VAS and Leq Hip levels, and a positive strong correlation was found between RLS duration and sleep NHP, Leq Knee OA severity and Kelgren Lawrence stage. In the study of Martinez et al. in which they examined sleep quality in patients with hip OA, a negative correlation was found between OA level and sleep quality, and similar results were obtained in our study.[36]

OA symptoms have negative effects on physical and social functions, sleep and quality of life. RLS affects the quality of life in line with OA, especially in terms of pain and symptoms; and the coexistence of OA and RLS causes problems such as exacerbation of RLS symptoms and deterioration in quality of life. The positive correlation between the severity of RLS, duration of RLS, BMI, night pain, and severity of OA detected in our study supports this result.

Although this is the first study in the literature to examine the association between hip and knee OA and restless legs syndrome, it has some limitations. Single-center design and limited number of patients are among such limitations. Although symptoms and severity were questioned meticulously, RLS may have been evaluated together with OA symptoms when determining symptom severity and disease duration since OA and RLS symptoms are similar.

CONCLUSION

It was detected in this study that the patients with knee OA has higher RLS duration, symptom severity and pain scores with more deterioration in quality of sleep and daily life activities when compared to those with hip OA; however, the increase in BMI, OA severity and RLS symptom duration causes an increase in strong pain scores in the severity of RLS, and impairment of sleep quality causes less increase in the severity of RLS.

Since the restless leg syndrome may exacerbate the symptoms, it should be considered as an underlying condition of the OA during clinical assessment. It was concluded that in the treatment and follow-up of restless legs syndrome, it should be aimed to increase the quality of life of the patients by following the treatment of hip and knee OA along with weight control of the patients

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Kafkas Üniversity Ethics Committee (Date: 26.02.2020, Decision No: 80576354-050-099/29).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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