

**ORIGINAL
ARTICLE**

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Comparison of the Frequency of Sleep Disorders among Patients with Rheumatoid Arthritis and Type 2 Diabetic Patients

ABSTRACT

Objective: The aim of this study was to compare the frequency of sleep disorder in rheumatoid arthritis (RA) patients and type 2 diabetic patients, and to find out the relationship between sleep disorder and DAS-28 (disease activity score).

Method: The Pittsburg Sleep Quality Index (PCQI) and the Epworth Sleepiness Scale (ESS) were administered to patients with RA according and patients with type 2 diabetes mellitus. DAS-28 score was used to define the disease activity of RA. The results of RA patients were compared with the results of patients with diabetes mellitus (DM).

Results: The participants of this study comprised 39 patients with RA (10 men and 29 women) and 40 patients with type 2 DM (12 men and 28 women). With regard to the categories in PCQI, there was no significant difference in poor sleep quality between the two groups. The rate of poor sleep quality was 87.2% in patients with RA and 79.5% in patients with DM (p=0.545). Furthermore, the Epworth Sleepiness Scale scores did not indicate any significant difference between the two groups with regard to excessive daytime sleepiness. We did not find any correlation of DAS scores with ESS and PSQI scores (respectively p=0.419, p=0.465).

Conclusion: Sleep disorders are common in both type 2 diabetic and RA patients. Sleep disorder is a factor that affects the quality of life. The high rate of sleep disorder in both chronic diseases points to the importance of evaluating the possibility of sleep disorders in patients with RA and DM.

Keywords: Rheumatoid Arthritis, Type 2 Diabetes Mellitus, Sleep Disorders

Romatoid Artritli Hastalarla, Tip 2 Diabetik Hastaların Uyku Bozuklukları Açısından Karşılaştırılması

ÖZ

Amaç: Bu çalışmanın amacı Romatoid artritli (RA) olan hastalardaki uyku bozukluğu sıklığının, tip 2 diabetik hastalarla karşılaştırılması ve uyku bozuklukları ile DAS-28 (hastalık aktivite skoru) ilişkisini araştırmaktır.

Metod: Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ve Epworth Uykululuk Skalası (EUS), RA ve tip 2 diabetes mellitus (DM)'lu hastalara uygulandı. DAS-28 RA aktivitesini değerlendirmek için hesaplandı. RA hastalarının sonuçları (DM)'lu hastalarla kıyaslandı.

Bulgular: Bu çalışmanın katılımcıları 39 RA'lı hasta (10 erkek, 29 kadın) ve 40 tip 2 DM'li (12 erkek, 28 kadın) hastadan oluşmaktaydı. PUKİ ile hesaplanan kategorilere göre kötü uyku kalitesi açısından anlamlı farklılık yoktu. Kötü uyku kalitesi RA'lı hastalarda %87.2 oranında, DM'li hastalarda %79.5 oranında görüldü (p=0.545). Bunun ötesinde EUS skorları arasında gündüz uykululuk değerlendirmesi açısından farklılık yoktu. DAS-28 skorları ile EUS ve PUKİ skorları arasında anlamlı bir korelasyon yoktu (sırasıyla; p=0.419 ve p=0.465).

Sonuç: Uyku bozuklukları tip 2 diabetik hastalarda ve RA hastalarında yaygındır. Uyku bozuklukları yaşam kalitesini etkileyen bir etkidir. Uyku bozukluklarının yüksek oranda bulunması RA ve DM'li hastalarda uyku bozukluğu olasılığının araştırılması açısından önemlidir.

Anahtar Kelimeler: Romatoid Artrit, Tip 2 Diabetes Mellitus, Uyku Bozuklukları

INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune disease that may affect multiple joints. This chronic disease, the etiology of which is unknown, is associated with systematic and chronic inflammation of joints (1). RA may cause joint involvement, stiffness, severe deformation and even disability. It is likely to cause early mortality and high morbidity because of frequent inflammation and decreased quality of life resulting from loss of function (2).

Among the symptoms of RA are painful and swollen joints, morning stiffness, fatigue, loss of appetite and sleep disorder (1-3). Sleep disorder is one of the most common symptoms in RA, which reportedly affects 50% of patients. In patients with RA, sleep disorder may be seen in the form of difficulty falling asleep and staying asleep and daytime sleepiness (3,4).

Disturbance in sleep quality may aggravate pain and mood symptoms in patients with RA.

Sleep disorder is a common symptom in patients with type 2 diabetes mellitus as well. In these patients, sleep disorder is a factor that makes it difficult to control diabetes (5).

The aim of this study was to compare the frequency of sleep disorder in RA patients and type 2 diabetic patients, and to find out the relationship between sleep disorder and DAS-28 score, i.e. the activity index for RA.

MATERIALS AND METHOD:

This study was conducted between March-May, 2015. This study was conducted in the patients with rheumatoid arthritis and type 2 diabetic patients who admitted to the family medicine and rheumatology outpatient clinics for routine controls. The Pittsburgh Sleep Quality Index and the Epworth Sleepiness Scale were administered to 39 patients, who were diagnosed with RA according to the diagnosis criteria defined by the American College of Rheumatology (ACR). The aim of surveys was to evaluate patients' sleep quality and tendency to daytime sleepiness. The results were correlated with patients' sex, age and disease activity. DAS-28 score was used to define the disease activity. The results of RA patients were compared with the results of 40 patients with diabetes mellitus (DM) – another chronic disease, the latter having comparable sex and age characteristics with RA patients.

The Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) is an instrument designed to evaluate sleep quality with questions falling under seven main categories, namely subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction.

The questions are scored from 0 to 3, where higher scores refer to poor sleep quality. Each of seven main categories is first evaluated

within itself, and then the scores of seven components are summed. When the total score is 5 and over, sleep quality is considered poor (6,7).

The Epworth Sleepiness Scale

The Epworth Sleepiness Scale (ESS), a simple questionnaire form used to measure the general level of daytime sleepiness, was developed by Johns in 1991. A 4-point scale is used for each of eight questions. The total score is 24, and a score of over 10 is considered a state of daytime sleepiness (8,9).

DAS-28 (Disease activity score-28)

The number of tender and swollen joints is used to evaluate the general health condition of a patient. A visual analogue scale (VAS) and erythrocyte sedimentation rate (ESR) are used to calculate the numbers. A DAS-28 score below 2.6 refers to remission, between 2.6 and 3.2 refers to low disease activity, between 3.2 and 5.1 refers to medium disease activity, and above 5.1 refers to high disease activity. Because the number of patients included in this study was small, we divided the group of RA patients into two and categorized them as patients with DAS-28 score of ≤ 3.2 and >3.2 (10).

Statistical Analysis: The continuous data were presented in the form of mean \pm standard deviation. The categorical data were presented in the form of percentages (%). The Shapiro–Wilk test was used to check whether the data showed normal distribution. The Mann-Whitney U test was used to compare the groups that did not have normal distribution. Pearson's chi-square test was used for the analysis of cross tables. Logistic regression analysis was used to determine risk factors. IBM SPSS Statistics 21.0 software was used for the analyses of data. The p value for statistical significance was <0.05 .

RESULTS

The participants of this study comprised 39 patients with RA (10 men and 29 women) and 40 patients with type 2 DM (12 men and 28 women). There was no difference between the two groups of patients in terms of the rate of age and sex (age: 48.95 ± 13.52 vs. 47.85 ± 9.74 years, $p=0.414$). In the group of patients with RA, DAS-28 score of 21 (58.3%) patients was ≤ 3.2 and 18 patients was >3.2 . According to the results of Pittsburgh Sleep Quality Index, there was no significant difference in mean score values between RA and DM patients (6.6154 ± 2.44535 vs. 6.6667 ± 3.08931 , $p=0.935$). The Epworth Sleepiness Scale scores were significantly lower in RA patients than in DM patients (6.0270 ± 5.26776 vs. 8.5250 ± 5.13404 , $p=0.038$). With regard to the categories in PCQI, there was no significant difference in poor sleep quality between the two groups. The rate of poor sleep quality was 87.2% in patients with RA and 79.5% in patients with DM ($p=0.545$). Furthermore, the Epworth Sleepiness Scale scores did not indicate any significant

difference between the two groups with regard to excessive daytime sleepiness. The rate of “excessive daytime sleepiness” was 21.6% in RA patients and 37.5% in DM patients ($p=0.144$). Comparison between groups was summarized in table 1.

Table 1. Comparison of RA and DM groups

	RA	DM	p
Age (years)	48.95 ± 13.52	47.85 ± 9.74	0.414
PCQI score	6.61 ± 2.44	6.66 ± 3.08	0.770
Poor Sleep Quality according to PCQI score	% 87.2	% 79.5	0.545
ESS score	6.02 ± 5.26	8.52 ± 5.13	0.038
Excessive Daytime Sleepiness according to ESS score	% 21.6	% 37.5	0.144

We also checked the correlation of DAS scores with ESS and PSQI, and no significant relationship was found between DAS-28 scores and scores of these two tests (respectively $p=0.419$, $p=0.465$). According to DAS scores, RA group was divided into two categories, patients with DAS score equal to and over 3.2 and patients with DAS score below 3.2. Between the two categories, there was no significant difference with respect to ESS and PSQI scores ($p=0.126$, $p=0.553$).

DISCUSSION

Sleep disorder is a very common problem and is considered a cardiovascular risk factor. Sleep disorders also make it difficult to control chronic diseases, including diabetes, obesity and hypertension (11).

Researches have shown that physiological and psychosocial problems cause sleep disorders in patients with RA. Sleep disorder in patients with RA is mostly associated with pain. The most common sleep disorders in patients with RA are difficulty falling asleep and staying asleep, interrupted sleep at night, waking up early in the morning, sleepiness throughout the day and fatigue due to sleeplessness (12-14).

Sleep disorders as well as mental disorders are likely to accompany chronic diseases (15). The relationship between sleep disorders and chronic diseases is mutual, particularly in the case of patients with DM and hypertension. While especially DM triggers sleep disorders, sleep disorders are likely to cause diabetes and make it difficult to control diabetes (16). The aim of this study was to compare the frequency of sleep disorders in two chronic diseases, in which sleep disorders are commonly seen, and to find out the relationship between sleep disorder and DAS-28

score in patients with RA. The results indicate that sleep disorders were highly frequent in patients with RA and patients with DM.

In patients with RA, the prevalence of sleep disorders, causing fatigue and daytime sleepiness, is quite high. Most RA patients often state that the disease causes disturbed sleep (17,18). They indicate that they have difficulty falling asleep, poor sleep quality and sleepiness throughout the day (19,20). The present study provided a discrepancy between surveys and objective sleep measurements. This may be because the patients with RA got used to a certain level of sleep disturbance during the course of their disease and thus were convinced that poor and interrupted sleep was sufficient in their lives. That is why it is important to evaluate sleep both objectively and subjectively in order to get full understanding of sleep disorders that RA patients suffer (17-20).

It is considered that physiological and psychosocial problems cause sleep disorders in patients with RA. Sleep disorder in patients with RA is mostly associated with pain. The main forms of sleep disorders in RA patients are difficulty falling asleep and staying asleep, interrupted sleep, waking up early in the morning, sleepiness throughout the day and fatigue because of sleeplessness (12).

In patients with RA, sleep disorders may result from pain and also from corticosteroids used in the treatment of RA. RA may also cause sleep apnea. It may be useful to evaluate the possibility of sleep disorders in RA patients (21). In RA, the frequency of poor sleep quality is high. It may be dependent on many factors, including disease activity, depression, pain, fatigue, dysfunction, radiological scores and CRP level (22).

Various methods have been suggested to cope with sleep disorders, among which are medical treatments, changes in the timing of current treatment, dietary guidelines (e.g. decaffeinated diet) and exercise at light or medium level.

As a conclusion, sleep disorders are common in both type 2 diabetic and RA patients. In patients with RA, sleep disorder has been reported to be associated with intensity of disease. The result of this study does not confirm this finding. This may be because the patient population of our study was limited compared to other studies. Sleep disorder is a factor that affects the quality of life. The high rate of sleep disorder in both chronic diseases points to the importance of evaluating the possibility of sleep disorders in patients with RA and DM.

Declaration of interest: *The authors declare that there is no conflict of interest*

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