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The assessment of sleep quality in rheumatoid arthritis patients.

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Abstract

Introduction: Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease. Sleep disorder is one of the most common symptoms in RA. In patients with RA, sleep disorder may be seen in the form of difficulty falling asleep and staying asleep, and daytime sleepiness. The aim of this study is to assess the frequency of sleep disorders in RA patients by means of validated survey forms, and to find out the relationship between sleep disorder and DAS 28 score (Disease Activity Score).
Methods: This study was conducted with 152 RA patients, admitted to the rheumatology department. A socio-demographic data form, the Epworth Sleepiness Scale, and the Modified Morisky Scale were used.
Results: A total of 152 RA patients (124 women, 28 men; age (average ± SD): 53.04 ± 11.34 years) participated in this study. There was no significant difference with regard to daytime sleepiness and OSAS risk between patients with and without activation (according to DAS 28 score) and between patients with positive and negative anti-CCP ($p>0.05$). There was no significant correlation between positive RF and OSAS risk ($p>0.005$) while there was a significant difference with regard to sleepiness between patients with positive and negative RF ($p<0.005$).
Conclusion: DAS 28 score and anti-CCP are not related to daytime sleepiness and OSAS risk in RA patients. There is a need for further studies conducted with sleep quality measurement methods.

Keywords: Rheumatoid arthritis, Sleep disorders, OSAS, Epworth sleepiness scale.

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Introduction

Rheumatoid Arthritis (RA) is a chronic systemic inflammatory disease, whose etiology is unknown. It is likely to affect individuals at any age, but most commonly seen in individuals aged between 30 and 50. Rheumatoid arthritis causes significant joint deformities, and may lead to lack of physical activity and even disabilities, and thus constitute a threat to professional life. The effects of disease are not restricted to the musculoskeletal system. RA also affects vital organs and systems of the body, including lungs, cardiovascular system, immune system and nervous system, and has adverse effects on lifespan and life quality [1]. Fatigue and sleep disorders-associated with joint deformities and systemic findings are among significant symptoms of RA, and are related to activity of the disease [2].

The disease is likely to cause joint involvement, malformation, severe deformation and disabilities. RA also results in early mortality and high morbidity because of frequent inflammation, and impaired quality of life because of the loss of function [3,4].

Among the symptoms seen in RA patients are joint pain, swollen joints, morning stiffness, fatigue, loss of appetite and sleep disorder [4,5]. Sleep disorder is one of the most common symptoms in RA. In patients with RA, sleep disorder may be seen in the form of difficulty falling asleep and staying asleep, and daytime sleepiness [5,6].

The aims of this study were to evaluate the frequency of sleep disorders in RA patients and to find out the relationship between sleep disorder and Disease Activity Score 28 (DAS-28) of RA.

Materials and Method

This study was conducted with 152 RA patients, admitted to the rheumatology department of the hospital between May 1, 2016 and May 30, 2016. A socio-demographic data form, the Epworth Sleepiness Scale, and the Modified Morisky Scale were used to collect data from patients. The relationship between these scales and disease activity was sought in the study.

The Epworth sleepiness scale (ESS)

The ESS is a test used to measure daytime sleepiness. It consists of eight questions. Respondents are asked to rate each question in the form from 0 to 3. This scale seeks a patient's likelihood of falling asleep under certain situations in daily life [7].

DAS-28 score

DAS-28 is the abbreviation of 'Disease Activity Score'. Physical examination shows the number of tender and swollen joints in hands, elbows, shoulders and knees. The results are noted in the form of, for example, 5 swollen and 10 tender joints. The patient is then asked to rate their general health condition from 0 to 10 mm on a visual scale. Furthermore, sedimentation or CRP laboratory results are added to the formulation. This formulation leads to an automatic calculation that produces a numeric value. These values let physicians know whether the disease activity is low, medium or high. 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 medium disease activity, and above 5.1 refers to high disease activity [8].

Statistical analysis

Continuous data were presented in the form of mean ± standard deviation. Categorical data were presented in percentages (%). The Shapiro-Wilk test was used to check the data for normal distribution. The Mann-Whitney U test was used to compare the groups that were not distributed normally, when the number of groups was two. The Pearson's correlation coefficient was calculated for data not distributed normally, and the Spearman's correlation coefficient was calculated for normally distributed data, with a view to determining the direction and degree of correlation between variables. The Yate's Chi-square test was used for the analysis of cross tables. The analyses were conducted on IBM SPSS Statistics 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). Statistical significance was based on the criterion of $p<0.05$.

Results

All participants of the study were patients diagnosed with RA by a rheumatology specialist. A total of 152 RA patients (124 women, 28 men; age (average ± SD): 53.04 ± 11.34 years) participated in this study. Socio-demographic data was shown in Table 1.

In the study, 35% of the participants were obese according to the WHO criteria. Moreover, 23.7% of the patients were smokers, and 50.66% of the patients had an accompanying disease. The three most frequent accompanying diseases were hypertension, hypothyroid, and type 2 diabetes mellitus. RF was positive in 70.40% of the patients, and anti-CCP was positive in 50.00% of the patients.

Other socio-demographic features are summarized in Table 1. Accompanying diseases of the patients are presented in Table 2. Table 2 indicates that hypertension accompanies rheumatoid arthritis in 16.4% of the patients.

Table 1. *Socio-demographic data.*

		Frequency (n)	Percentage (%)
Sex	Women	124	81.58
	Men	28	18.42
Marital status	Married	135	88.82
	Single	16	10.53
Education	Primary	104	68.42
	Secondary	16	10.53
	Upper Secondary	23	15.13
	University	9	5.92
Occupation	Worker	21	13.82
	Government employee	9	5.92
	Housewife	102	67.11
	Self-employed	1	0.66
	Retired	19	12.5

Table 2. *Accompanying diseases.*

		Frequency (n)	Percentage (%)
Accompanying disease	None	75	49.34
	Hypertension	25	16.45
	Diabetes mellitus	14	9.21
	Hyperthyroidism	12	7.89
	Diabetes Mellitus +Hypertension	6	3.95
	Coronary artery disease	5	3.29
	Asthma	2	1.32
	Anaemia	1	0.66
	Hepatitis B virus infection	1	0.66
	Osteoporosis	1	0.66
	Familial Mediterranean fever	1	0.66
	Breast cancer	1	0.66

There was no significant difference with regard to daytime sleepiness (as measured by the ESS) and OSAS risk between patients with and without activation (according to DAS-28 score) and between patients with positive and negative anti-CCP ($p>0.05$). There was no significant correlation between positive RF and OSAS risk ($p>0.005$) while there was a significant with regard to sleepiness (as categorized by EPSS

scores) between patients with positive and negative RF ($p<0.005$).

The relationship between BMI and sleep level was not significant ($p>0.005$), but the relationship between BMI and sleep level was significant ($p>0.005$).

There was no significant relationship between smoking and sleep level and OSAS risk ($p>0.005$).

Discussion

We aimed to evaluate the frequency of sleep disorders in RA patients, and to determine the relationship between sleep disorder and DAS-28 score, i.e. the activity index for RA in this study. To the best of our knowledge, the present study is the first attempt to analyse the relationship between anti-CCP and RF results and sleep disorder. This study set out to seek the relationship of sleep disorder with positive RF and/or positive and negative anti-CCP.

The Berlin questionnaire results revealed that 28.3% of the patients had high risk of OSAS, and the Epworth Sleepiness Scale results revealed that 25.7% of the patients' were suffering severe sleepiness.

In RA patients, joint pain is mostly accompanied by sleep disorders. RA patients frequently suffer sleep disorders such as irregular sleep patterns, difficulty with sleep initiation and duration, daytime sleepiness, difficulty with falling asleep, and repeated interruptions of sleep in the night [5,6].

The most significant result of our study is that there was no significant difference with regard to daytime sleepiness (as measured by the EPSS) and OSAS risk between patients with and without activation (according to DAS-28 score) and between patients with positive and negative anti-CCP ($p>0.05$).

Anti-CCP is a more recent and more specific marker than RF for RA; however, it is not an indicator of inflammatory activity [9]. Sleep disorders are highly related to pain in RA patients. The fact that sleep disorders continue despite the remission leads us to thinks that there may be an inflammatory relationship. Fibromyalgia accompanying RA is another cause of sleep disorders [10]. It is reported in the literature that there is a strong relationship between pain intensity and sleep disorder [11,12].

The approaches that regulate sleep order and central pain mechanisms are likely to be more effective than disease-modifying therapies in reducing pain. Sleep disorder itself is also related to pain sensitivity [12,13]. The limitations of these studies are that they are conducted in a single center and do not take pain scores into consideration.

As a result, DAS-28 score and anti-CCP are not related to daytime sleepiness and OSAS risk in RA patients. There is a need for further studies conducted with sleep quality measurement methods.

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