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Pain, depression levels, fatigue, sleep quality, and quality of life in elderly patients with rheumatoid arthritis

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Background/aim: The aim of this study was to evaluate and determine the relationships (if any) among pain, depression levels, fatigue, sleep quality, and quality of life in patients with rheumatoid arthritis (RA) aged 65 years and over, and to compare the results with those of RA patients under 65 years of age.

Materials and methods: The study included 52 patients with RA aged 65 years and over (Group 1) and 84 patients with RA under 65 years of age (Group 2). Pain, depression levels, fatigue, sleep quality, quality of life, and disease activity of all of the participants were evaluated using a visual analog scale (VAS), the Beck Depression Inventory (BDI), the Checklist Individual Strength (CIS), the Pittsburgh Sleep Quality Index (PSQI), the Short Form-36 (SF-36), and the Disease Activity Score-28, respectively.

Results: When the two groups were compared, higher scores for the VAS, BDI, total CIS, and PSQI were found in Group 1 compared to Group 2 ($P = 0.003$, $P = 0.003$, $P = 0.007$, and $P = 0.001$, respectively). The SF-36 subscales of the physical component summary and mental component summary were not statistically significantly different between the two groups ($P > 0.05$).

Conclusion: This study evaluated the situation in elderly patients with RA and showed that pain, depression level, fatigue, and sleep quality worsen with age.

Key words: Rheumatoid arthritis, age, depression level, fatigue, sleep quality

1. Introduction

Rheumatoid arthritis (RA), an autoimmune disease of unknown etiology with systemic symptoms, especially involves joints and progresses with deformations (1). It has been reported that the prevalence of RA ranges from 0.5% to 1%. The disease is two to three times more common in women than in men (2).

As RA is a disease with systemic involvement, pain, increased depression level, and fatigue, as well as deteriorated quality of sleep and life, frequently accompany the involvement of the musculoskeletal and extraarticular systems (3–9). Pain is a frequent symptom in RA patients, and it generally progresses as chronic pain (3). Although its etiology is not exactly known, it is considered that fatigue in patients with RA is related to pain, disability, inflammation, psychosocial factors, and sleep disorders (6). Depression, also frequent in RA, has been found to be related to the level of fatigue and sleep disorders (7,10). Difficulty in falling asleep, increased frequency of waking during the night, and deteriorated sleep quality have been detected in patients with RA (8). It has been found that deteriorated sleep quality is related to pain, fatigue, and depression level (1). Pain, fatigue, and deteriorated sleep quality also negatively affect the quality of life of RA patients (9).

As has been reported, pain, increased depression level, fatigue, and deteriorated quality of sleep and life are frequent complaints in patients with RA, and these symptoms all affect and worsen each other. Various studies have evaluated these parameters in patients with RA, generally focusing on young populations. However, there are relatively few studies evaluating these symptoms in patients 65 years of age and over. Therefore, it would not be correct to generalize the results of these studies for all patients with RA, especially those aged 65 years and over.

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Given that life expectancy is now extended, knowing the frequency and severity of these parameters in patients aged 65 years and over is increasingly important for physicians in the treatment and follow-up of the disease. As such, the aim of this study was to evaluate and determine the relationships (if any) among pain, depression levels, fatigue, sleep, and quality of life in RA patients aged 65 years and over, and to compare the results with those of RA patients under 65 years of age.

2. Materials and methods

2.1. Subjects

This study was conducted at a department of rheumatology from July 2013 to January 2014. Fifty-two subjects aged 65 years and over and 84 subjects under 65 years of age, all diagnosed with RA according to the American College of Rheumatology 2010 criteria, were enrolled in the study by a rheumatologist (11). The patients were tested for 1-h erythrocyte sedimentation rate, C-reactive protein, complete blood count, renal and hepatic functions, rheumatoid factor, and thyroid function. Patients younger than 18 years; patients whose pain severity was 8 or more according to a visual analog scale (VAS) (12); patients with a pathology that could lead to joint pain, such as a fracture, joint dislocation, acute strain, or sprain; patients with inflammatory rheumatic diseases other than RA; patients who did not adhere to the RA drug therapy; patients taking antidepressants or anxiolytics; patients taking drugs that could affect sleep quality; patients with hypothyroidism; pregnant patients; patients with a history of stroke or malignancy; and patients with cognitive dysfunction who could not complete the study were excluded. Approval of the local ethics committee was provided. All of the participants were informed about the study and provided written consent.

2.2. Data collection

The age, sex, body mass index (BMI), working status, medical comorbidities, and current medications of all of the participants were recorded, as was duration of the disease. The participants were instructed not to exercise 24 h before the second visit, so as not to influence the VAS, Checklist Individual Strength (CIS), Pittsburgh Sleep Quality Index (PSQI), and Disease Activity Score-28 (DAS-28) scores.

During the second visit, the pain level, depression level, fatigue level, sleep quality, quality of life, and disease activity of the participants were evaluated using the VAS, Beck Depression Inventory (BDI), CIS, PSQI, Short Form-36 (SF-36) questionnaire, and DAS-28, respectively. The results were recorded by a researcher.

2.2.1. Assessment of pain severity

The VAS rates the pain of the individual on a 0–10 scale and is widely used in studies (13,14). Patients were evaluated in terms of pain with movement during the previous week.

2.2.2. Assessment of depression level

Depression levels were assessed by the BDI, which included 21 items with scores ranging from 0 to 3. The highest possible score is 63 points. The BDI, which is one of the most commonly used self-rated depression scales, can be adapted to every age group and is considered highly reliable (15).

2.2.3. Assessment of fatigue

The CIS is a questionnaire with 20 items that can be scored on a seven-point Likert scale. The CIS is designed to assess different dimensions of fatigue: 1) the subjective experience of fatigue (eight items), 2) reduction in motivation (four items), 3) reduction in physical activity (three items), and 4) reduction in concentration (five items). A total CIS score is obtained by summing the scores from the four dimensions. Higher scores indicate higher levels of fatigue, more concentration problems, less motivation, and low levels of physical activity (16,17). The total CIS score was evaluated in the present study.

2.2.4. Assessment of sleep quality

The PSQI was used for the assessment of sleep quality over a 1-month period. Nineteen individual items generated seven component scores, which were summed to produce a global score with a range of 0 to 21. Higher scores represented poorer subjective sleep quality. Sleep disturbance was classified as a PSQI score of >5 (18).

2.2.5. Assessment of quality of life

The SF-36 is a generic health-related quality of life questionnaire employed to obtain scores for eight subscales, including physical function, role-physical, role-emotional, social functioning, general health, mental health, vitality, and bodily pain. These subscales are combined to form two higher-order summaries: the physical and mental health component summaries. Each subscale and each summary is reported on a 0–100 scale. Higher scores indicate better health-related quality of life (19).

2.2.6. Assessment of disease activity

Disease activity of RA patients was evaluated using the DAS-28 (20). For this purpose, tender joint count, swollen joint count, erythrocyte sedimentation rate, and global assessment score were used. According to the DAS-28 scores, disease activity was defined to be in remission (≤2.4), with mild activity (>2.4 to <3.2), or with severe activity (>5.1).

2.3. Statistical analysis

Data were analyzed using SPSS. Descriptive statistics for continuous variables are presented in the form of means and standard deviations, whereas categorical data are presented as numbers and percentages. Clinical data conforming to a normal distribution were compared using Student's t-test. Nonparametric Mann–Whitney or chi-square tests were performed to compare sociodemographic and clinical

measures between the two groups. To determine linear associations between independent variables, Spearman's rho correlation coefficients were calculated. For Spearman's rho, correlations from 0 to 0.25 were considered as 'no correlation', 0.25 to 0.50 as a 'mild/moderate correlation', 0.50 to 0.75 as a 'strong correlation', and 0.75 to 1.00 as a 'very strong correlation'. We considered a significance level of $P < 0.05$ to be statistically significant.

3. Results

Of 155 RA patients who were evaluated for inclusion in the study, 11 were excluded because they did not complete the questionnaire and eight were excluded because they did not want to answer the questions due to time constraints. Ultimately, the study was completed with a total of 136 patients, including 52 patients aged 65 years or over (Group 1) and 84 patients under 65 years of age (Group 2). The age ranges were 65–83 years in Group 1 and 23–64 years in Group 2. The demographic characteristics of the two groups are shown in Table 1.

The median disease duration was 120 months (range: 6–480 months) in Group 1 and 72 months (range: 6–360 months) in Group 2 ($P > 0.05$). The median DAS-28 scores were 2.78 (range: 0.54–5.9) in Group 1 and 2.41 (range: 1.3–4.55) in Group 2 ($P > 0.05$). Comorbid diseases and medical treatments administered for RA in both groups are presented in Table 2.

When the two groups were compared, higher scores for the VAS, BDI (scores above 17 indicated depression), total CIS, and PSQI were found in Group 1 compared

Table 1. Demographic characteristics of Group 1 and Group 2.

	Group 1 (n = 52)	Group 2 (n = 84)	P-value
Age, years (mean ± SD)	67.69 ± 4.33	45.71 ± 10.46	<0.001
Sex			0.244
Female	45 (86.5%)	66 (78.6%)	
Male	7 (13.5%)	18 (21.4%)	
BMI (mean ± SD)	28.22 ± 4.19	27.54 ± 4.29	0.365
Occupation			0.039
Housewife	42 (80.8%)	54 (64.3%)	
Civil servant	4 (7.7%)	21 (25%)	
Work requiring physical effort	6 (11.5%)	9 (10.7%)	

SD: Standard deviation.
BMI: Body mass index.

Table 2. Comorbid diseases and medical treatment of Group 1 and Group 2.

	Group 1 (n = 52)	Group 2 (n = 84)	P-value
Comorbid diseases			<0.001
Diabetes mellitus	6 (11.5%)	5 (5.9%)	
Hypertension	17 (32.8%)	5 (5.9%)	
Coronary artery disease	1 (1.9%)	1 (1.1%)	
Chronic obstructive pulmonary disease	0	1 (1.1%)	
No comorbid diseases	28 (53.8%)	72 (86%)	
Medical treatment			0.581
DMARD	49 (94.2%)	74 (88.1%)	
TNF-alpha blockers	3 (5.8%)	10 (11.9%)	

DMARD: Disease-modifying antirheumatic drugs.
TNF: Tumor necrosis factor.

to Group 2 (P = 0.003, P = 0.003, P = 0.007, and P = 0.001, respectively). The SF-36 subscales of the physical component summary and mental component summary were not statistically significantly different between the two groups (P > 0.05) (Table 3).

The correlation analyses of the data from Group 1 and Group 2 are presented in Tables 4 and 5.

4. Discussion

In this study, RA patients aged 65 years or over had higher pain, higher depression level, increased fatigue, and worse sleep quality in comparison to matched RA patients under 65 years of age; however, there was no significant difference between the two groups with respect to quality of life.

Pain is a common RA symptom in every age group and the study by Jakobsson et al. suggested that the severity of pain increases with advanced age (21). Depression is another frequent symptom of RA, affecting more than 25% of patients (22). A study comparing the depression levels of RA patients aged 65 years or over and RA patients under 65 years reported a 36.9% frequency of depression in the older patients, whereas only 16% of the younger individuals had depressive moods (23). A study of 713 RA patients conducted by Wolfe and Hawley detected a higher level of depression in elderly patients (24). Fatigue is highly frequent in patients with RA, with the frequency of severe fatigue ranging from 42% to 69% (25). The study by Nicassio et al. suggested that a model of increased disease activity, low mood, and poor sleep explains 62% of variance in RA fatigue (26). Deteriorated sleep quality, another frequent symptom of RA, is observed in more than half of patients (25,27). Sleep studies in patients with RA have revealed that interruptions in sleep are more frequent than changes in sleep phases. In addition, falling asleep takes longer for them, they wake up several times during the night and early in the morning, and they experience daytime sleepiness (5,28). Sleep difficulties have been in large part attributed to articular pain, depression, psychosocial stress and fatigue (29–31). This profile of sleep loss during part of the night, ubiquitous in those with RA, may result in a vicious cycle in which sleep disturbance activates clinical symptoms of mood and pain, which then contributes to further sleep loss (32). RA negatively affects the quality of life of patients. A study of RA patients aged 29–70 years detected extremely poor quality of life and showed that pain and problems with movements negatively affected quality of life (33).

Table 3. Comparison of Group 1 and Group 2 based on VAS, BDI, total CIS, PSQI, and SF-36 subscale scores.

	Group 1 (n = 52), mean ± SD	Group 2 (n = 84), mean ± SD	P-value
VAS	4.42 ± 2.23	3.32 ± 1.92	0.003
BDI	16.44 ± 9.39	12.17 ± 7.24	0.003
Total CIS	94.59 ± 23	82.45 ± 26.42	0.007
PSQI	7.07 ± 4.21	5.01 ± 2.89	0.001
SF-36			
Physical function	46.84 ± 26.50	55.05 ± 26.46	0.011
Role-physical (median, min–max)	0 (0–100)	25 (0–100)	0.178
Bodily pain	52.50 ± 24.80	42.73 ± 20.49	0.014
General health	54.42 ± 9.11	53.09 ± 10.52	0.454
Physical component summary	44.56 ± 12.48	46.74 ± 12.55	0.062
Vitality	53.65 ± 10.39	51.01 ± 11.24	0.173
Social function	45.43 ± 16.23	44.49 ± 13.49	0.716
Role-emotional (median, min–max)	0 (0–100)	33.3 (0–100)	0.075
Mental health	51.61 ± 12.80	52.61 ± 10.50	0.620
Mental component summary	46.81 ± 12.92	49.33 ± 12.77	0.267

SD: Standard deviation, VAS: Visual analog scale, BDI: Beck Depression Inventory, CIS: Checklist Individual Scale, PSQI: Pittsburgh Sleep Quality Index, SF-36: Short Form-36, min: minimum, max: maximum.

Table 4. The correlation analyses of the data from Group 1.

	VAS		BDI		Total CIS		PSQI		Physical function		Role physical		Bodily pain		General health		Vitality		Social function		Role emotional		Mental health	
	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P
VAS	1		0.476	<0.001	0.283	0.042	0.269	0.054	−0.256	0.067	−0.433	0.001	0.508	<0.001	0.219	0.118	−0.173	0.219	−0.027	0.851	0.006	0.967	−0.049	0.730
BDI	0.476	<0.001	1		0.568	<0.001	0.366	0.008	−0.625	<0.001	−0.681	<0.001	0.503	<0.001	0.260	0.063	−0.156	0.268	0.177	0.208	−0.478	<0.001	−0.356	<0.001
Total CIS	0.283	0.042	0.568	<0.001	1		0.329	0.017	−0.614	<0.001	−0.613	<0.001	0.345	0.012	0.424	0.002	0.111	0.432	0.147	0.298	−0.430	0.001	−0.260	0.063
PSQI	0.269	0.054	0.366	0.008	0.329	0.017	1		−0.431	0.001	−0.166	0.240	0.280	0.045	0.361	0.009	0.255	0.068	0.238	0.089	−0.113	0.425	−0.206	0.143

VAS: Visual analog scale, BDI: Beck Depression Inventory, CIS: Checklist Individual Scale, PSQI: Pittsburgh Sleep Quality Index.

Table 5. The correlation analyses of the data from Group 2.

	VAS		BDI		Total CIS		PSQI		Physical function		Role physical		Bodily pain		General health		Vitality		Social function		Role emotional		Mental health	
	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P	r	P
VAS	1		0.188	0.087	0.159	0.149	0.311	0.004	−0.179	0.103	−0.359	0.001	0.424	<0.001	0.078	0.479	−0.038	0.704	0.005	0.963	0.129	0.243	0.229	0.036
BDI	0.188	0.087	1		0.510	<0.001	0.345	0.001	−0.556	<0.001	−0.531	<0.001	0.469	<0.001	0.088	0.429	−0.053	0.635	0.126	0.254	−0.453	<0.001	−0.343	0.001
Total CIS	0.159	0.149	0.510	<0.001	1		0.426	<0.001	−0.576	<0.001	−0.411	<0.001	0.490	<0.001	0.244	0.025	0.020	0.859	0.037	0.741	−0.330	0.002	−0.168	0.126
PSQI	0.311	0.004	0.345	0.001	0.426	<0.001	1		−0.477	<0.001	−0.418	<0.001	0.500	<0.001	0.129	0.242	−0.069	0.534	0.187	0.089	−0.181	0.100	−0.022	0.840

VAS: Visual analog scale, BDI: Beck Depression Inventory, CIS: Checklist Individual Scale, PSQI: Pittsburgh Sleep Quality Index.

This study supported all of the aforementioned studies, determining that pain, depression level, fatigue, and deteriorated quality of sleep were negatively affected in RA patients aged 65 years or over. In this study, the depression level and deteriorated sleep quality in RA patients aged 65 years or over were 50% and 57.6%, respectively. When the depression level of elderly people was analyzed, it was determined that advanced patient age without RA also increases depression level (34). The depression level and deteriorated sleep quality are considerably higher in elderly patients with RA. Assessments of elderly patients with RA should thus focus on pain complaints, psychological problems, fatigue, and sleep patterns. It should also be kept in mind that advanced patient age without RA also influences depression level. However, there was no significant difference between the two groups with respect to quality of life. Although it was expected that a negative impact on the quality of life would increase as patients with RA aged and developed musculoskeletal diseases such as osteoarthritis and other comorbid diseases, the results of this study can be explained by the fact that patients accept and get used to this condition over time, considering their current condition to be good enough. Adaptation and acceptance on the part of patients also increase the chances of positive responses to treatment.

It is known that pain, increased depression level, fatigue, and deteriorated quality of sleep are highly frequent symptoms of RA, and many studies have shown that these parameters are interrelated, triggering and negatively affecting each other. Fatigue associated with RA is related to pain, inflammation, psychosocial factors, and sleep disorders, while depression is related to the level of fatigue and sleep disorders (6,7,10). A study comparing 27 RA patients with healthy controls showed that sleep loss leads to an increase in the number of painful joints and severity of joint pain, as well as symptoms such as fatigue and anxiety (32). The present study also detected relationships among pain, depression level, fatigue, and quality of sleep within the two patient groups. Therefore, evaluation and correct treatment of these variables in patients with RA will help to end the vicious cycle of triggering each other and ensure more positive results in treatment and follow-up.

There are several limitations to this study. First, the sample size was small, which may limit its applicability. Second, it was a cross-sectional study with no control group. Studies including a control group and long follow-up periods might provide better guidance in terms of pain, depression level, fatigue, quality of sleep and life, influencing factors, and their long-term effects. Third, patients with fibromyalgia were not excluded. The presence of patients with fibromyalgia may also affect some of the parameters, such as pain, depression level, fatigue, and sleep quality. Finally, because the study was conducted at a single center, it cannot be generalized to the whole population, thus decreasing the strength of the study.

Due to developments in the treatment of RA, a great number of patients can live to advanced ages, and the frequency of RA starting in advanced age increases as life expectancy increases (35). Treatment and control of the disease become more complex in elderly RA patients. Many studies have evaluated pain, depression level, fatigue, sleep quality, and quality of life in patients with RA. Unlike most of those studies, which were conducted with young populations and whose results could not be generalized to all patients with RA, this study evaluated the situation in patients aged 65 years or over and showed that pain, depression level, fatigue, and sleep quality worsen with age. In other words, the treatment and follow-up of elderly patients with RA should focus on these parameters. However, multicenter studies with a greater number of elderly patients are required for more accurate data.

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