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ORIGINAL ARTICLE

Sleep Quality in Patients Presenting with Rheumatoid Arthritis at Tertiary Care Hospital, Islamabad

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ABSTRACT

Aim: To assess the sleep quality in patients presenting with rheumatoid arthritis.
Study design: Cross-sectional study.
Place and duration of study: Department of Rheumatology, PIMS, Islamabad from 1st September 2022 to 28th February 2023.
Methodology: One hundred and forty-three patients with rheumatoid arthritis (RA) were enrolled. The age of the patients was between 40-80 years. The sleep quality was assessed in both groups and compared to assess the effect of rheumatoid arthritis on sleep quality. The patients were divided into two groups. Group A was those having non-optimal sleep duration. In contrast, group B was those who had optimal sleep duration. The sleep quality assessing tool Pittsburg Sleep Quality Index was applied to assess the disease activity and the patient's sleep quality. Disease activity was assessed using Visual Analogue Scale (VAS), Clinical Disease Activity Index (CDAI), and Health Assessment Questionnaire Disability Index (HAQ-DI).
Result: The mean age of the patients was 51.2±9.61 years, with patients having a non-optimal sleep slightly younger than optimal. Most of the cases were females. Non-optimal sleep group has slightly higher disease activity than the optimal sleep group. The optimal sleep was observed in only 44.2% of cases, while non-optimal sleep was observed in 55.8%. Higher sleep disturbance was observed in patients with high VAS and increased snoring and awakening short of breath with headaches.
Practical implication: The significance of this study is providing factors associated with poor sleep quality in rheumatoid arthritis patients and thus assisting in generating management protocols of such cases for better health outcomes and sleep quality.
Conclusion: Rheumatoid arthritis patients have an increased prevalence of non-optimal sleep strongly associated with increased pain levels.
Keywords: Sleep quality, Rheumatoid arthritis, Tertiary care hospital

INTRODUCTION

Rheumatoid Arthritis (RA) is an auto-immune disorder cause joint inflammation, cartilage or bone destruction and synovium alterations resulting in subsequent inflammation and pain[1]. The etiology of rheumatoid arthritis is unknown; however, half of the cases were related to genetic background.[2] The global prevalence of RA is around 1%, with a few countries presenting higher prevalence while others have reduced prevalence of this disease[3,4].

Painful Conditions have a high risk of sleep disturbances. Similarly, pain and joint inflammation in RA has been reported to contribute to sleep quality[5-8]. The sleep-related problems in patients with chronic ailments are related to various reasons, including low quality of life, psychological problems, cognitive rejections, increased morbidities, and excruciating fatigue[9-13].

Rheumatoid arthritis has also been described as a variable spectrum of ailment with various manifestations. Patients having radiological damage are demonstrated by a augmented and sharp score even prior to the complete clinical symptoms of the disease[14].

Sleep disturbances have been recognised as an unnotified characteristic of rheumatism. It is pertinent to mention that seep has a significant role in the immune system of the human body as well as in overall health maintenance. Poor and deprived sleep quality is associated with higher risk of cerebrovascular disease as well as mortality in the general public[15].

RA patients suffer from a high level of depression which results in deprivation of their quality of life and sleep-related disturbances. Several studies have found the positive correlation between disease progression and sleep deprivation. Research has demonstrated that poor quality of sleep is directly related to disease activity[12-16].

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This study aims to examine the relationship between disease activity in rheumatoid arthritis patients and their sleep quality in Pakistan. The study will investigate the sleep patterns of RA patients and provide insights into how disease activity affects their sleep quality. The results of this study will contribute to the identification of the specific profile of sleep quality among RA patients in Pakistan and provide valuable information for the development of effective management strategies.

MATERIALS AND METHODS

After IRB permission this cross-sectional study was conducted at the Department of Rheumatology, Pakistan Institute of Medical Sciences, Islamabad from 1st September 2022 to 28th February 2023 and a total of 143 patients were enrolled. The sample size was calculated using the World Health Organization's sample size calculator, with a prevalence of PSQI >5 set at 38.5%, an 8% margin of error, and a 95% confidence level. The study included all cases of rheumatoid arthritis diagnosed for over a year and attending regular follow-up appointments at the PIMS OPD. We included patients of all age groups and gender. Patients with a history of hypothyroidism or hyperthyroidism, malignancy, systemic lupus erythematosus, depression or mania, cognitive impairment and various metabolic syndromes including asthama, stroke, chronic obstructive pulmonary disease and heart failure. A well-structured questionnaire was used to document each enrolled patient's clinical, diagnostic, and demographic details. The sleep quality of both groups was assessed and compared to determine the effect of RA on sleep quality. The patients were divided into two groups; Group A, which included patients with non-optimal sleep duration, and Group B, which included patients with optimal sleep duration. Pittsburgh Sleep Quality Index was used to assess sleep quality in all patients. This scale measured sleep quality of patient over the period of 1 month consisting of 19 total items for better evaluation of different indicators. A PSQI score greater than or equals to 5 was considered indicative of poor sleep quality,

based on the total scale score. The disease activity of patients was measured using the DAS-28, which is a physician-based measure that includes the number of tender and swollen joint counts (ranging from 0 to 28), erythrocyte sedimentation rate (ESR), and patient global score (ranging from 0 to 100). Additionally, disease pain status was confirmed through the use of the Visual Analogue Scale (VAS), Health Assessment Questionnaire Disability Index and Clinical Disease Activity Index. Data were analyzed using SPSS version 25.0, with statistical tests including chi-square, Spearman's rank test, logistic regression, and odds ratio. A P-value of less than 0.001 was considered significant.

RESULTS

The mean age was 51.2±9.61 years. Patients with non-optimal sleep duration were slightly younger than those with optimal sleep duration, and most cases were female. Of the total cases, 61.1% were employed, with a higher proportion in group A (non-optimal sleep) than in group B (optimal sleep). Non-optimal sleep patients had a longer disease duration and higher pain intensity than optimal sleep patients. The sleep quality assessment tools, DAS28 and Pittsburgh Sleep Quality Index revealed that the non-optimal sleep group had significantly higher disease activity than the optimal sleep group. Similarly, levels of inflammatory markers and risk of disability were also higher in the non-optimal sleep group. Table 1 presents variables related to sociodemographic and disease factors associated with optimal and non-optimal sleep duration. A significant association was found between sleep quality and disease activity, highlighting the importance of addressing sleep issues in the management of rheumatoid arthritis.

The sleep characteristics of the patients were evaluated using various parameters. The median score for sleep disturbances was 48.9, indicating significant sleep disruption. The median score for snoring was 60.0, suggesting a high prevalence of this sleep issue. The sleep problem index had a median score of 50.0, indicating moderate sleep problems among the patients. Only 44.2% of the patients reported having optimal sleep, while the majority (55.8%) had a non-optimal sleep (Table 2).

The study found that 8.2% of patients took pain medication daily, while 9.3% took sleeping pills regularly. On the other hand, a majority of patients (67% and 83.5%, respectively) reported never using pain medication or sleeping pills for managing their RA symptoms and sleep quality (Fig. 1).

The Spearman's rank correlation analysis revealed that patients with higher visual analog scale (VAS) scores for pain had a higher frequency of sleep disturbances, increased snoring levels, and reported awakening short of breath with headaches. In addition, sleep adequacy was negatively correlated with a prolonged history of rheumatoid arthritis (RA) disease (Table 3).

Regression analysis showed that age, CDAI, and disease duration were associated with higher odds ratios for non-optimal sleep duration than optimal sleep duration. Additionally, patients with higher pain levels were found to have poorer sleep quality. These results are summarized in Table 4.

Table 1: Comparison of patients in non-optimal and optimal sleep group

Variable	Non Optimal-Sleep (Group A) (*n* = 71)	Optimal Sleep (Group B)(n=72)	p-value
Age in years	49.99±9.15	51.39±10.26	0.482
Male	24 (33.3%)	23 (31.7%)	0.867
Female	47 (66.7%)	49 (68.3%)	
Employed	45 (63%)	42 (58.5%)	0.661
Unemployed	26 (37%)	30 (41.5%)	
Disease duration; median value of 2nd quartile	78.1 (36.1–144.1)	60.1 (28.60–138.1)	0.452
Pain intensity; median value of 3rd quartile	3.85 (2.4–6.1)	2.6 (2.1–3.6)	0.003
Functional disability			
No disability	69.8%	92.7%	0.006
Disability	30.2%	7.3%	
Disease activity			
Remission	29.6%	30.8%	0.042
Low	31.5%	38.5%	
Moderate	27.8%	25.6%	
High	11%	4.99%	
Inflammatory Indicators			
CRP(mg/dL) and median value of 2nd and 3rd quartile	3.06 (1.08–7.06)	2.71 (1.01–5.56)	0.594
TNF-α(g/mL) and median value of 2nd and 3rd quartile	1.66 (0.55–2.9)	1.61 (0.65–2.33)	0.884
IL-6 (pg/mL); median (Q_{25}–Q_{75})	4.48 (2.05–9.68)	3.45 (1.73–6.19)	0.179
Therapy			
Disease-modifying drugs	51 (72.2%)	67 (92.7%)	0.012
Biologicals	36 (50%)	25 (34.1)	0.122
Corticosteroid	13 (18.5%)	10 (14.6%)	0.616
Non steroidal anti inflammatory	5 (07.4%)	18 (24%)	0.02
Other therapeutic drugs	40 (55.6%)	40 (56.1%)	0.958

Table 2: Sleep-related characteristics of enrolled RA patients (n=95)

Tested sleep deprivation variables	
Median (2nd and 3rd quartile)of sleep disturbance	48 (19–71)
Median (2nd and 3rd quartile)of snoring	60 (40–80)
Median (2nd and 3rd quartile)of shortness of breath or headache	40 (0–50)
Median (2nd and 3rd quartile)of sleep adequacy	80 (50–110)
Median (2nd and 3rd quartile)of somnolence	46 (33–66)
Median (2nd and 3rd quartile)of sleep problem index I	50 (36–66)
Median (2nd and 3rd quartile)of sleep problem index II	52 (38–67)
Optimal-sleep	
Having optimal sleep	44%
Not having optimal sleep	55%

Table 3: Correlation of spearman' rank with sleep domains

Variable	Sleep Hours	Sleep Disturbance	Snoring	Sleep disturbance due to Short of Breath or with Headache	Sleep Adequacy	Sleep Somnolence	Sleep Problem Index I	Sleep Problem Index II
Age	0.078	−0.008	0.205 *	−0.013	0.044	−0.028	−0.051	−0.041
Disease duration	−.178	0.202 *	−.038	0.135	−.067	0.185	0.174	0.150
VAS score	−.351 **	0.381 **	0.227 *	0.280**	−.280 **	0.306 **	0.375 **	0.407 **
Scores ofCDAI	−.305 **	0.325 **	0.211 *	0.250 *	−.276 **	0.149	0.294 **	0.323 **
Scores of HAQ-DI	0.248 *	0.460 **	091	0.299 **	−.437 **	0.391 **	0.501 **	0.517 **

* $p < 0.005$ and ** $p < 0.001$

Fig. 1: Frequency of pain medication and sleeping pills in enrolled cases

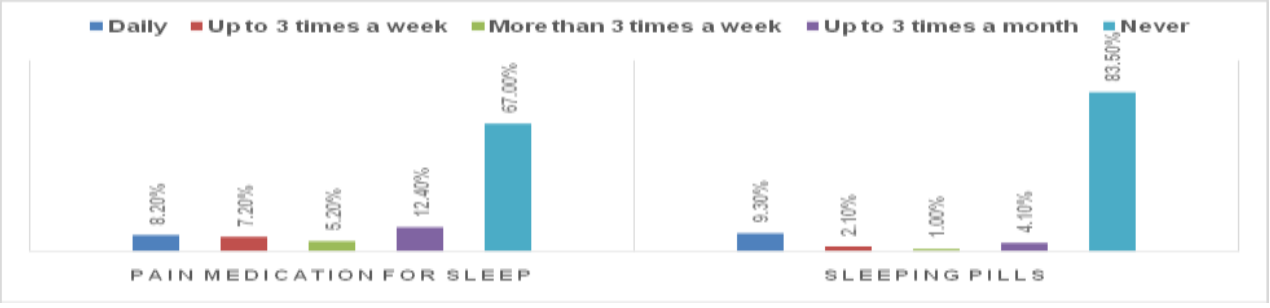

Table 4: Association of variables of Regression model with optimal sleep duration

Variable	Odds ratio	95% confidence-interval	P-value
Age in years	01.04	0.9 –1	.163
VAS pain scale	0.67	0.4 – 1	.039
HAQDI-scores	0.54	0.1 – 1	.214
CDAI-scores	01.03	0.9 – 1	.545
Duration of disease	01.01	0.9 - 1	.758

DISCUSSION

The current study highlights a direct association between rheumatoid arthritis and poor sleep quality, with 55.8% of the cases experiencing sleep problems mainly due to non-optimal sleep duration. This finding is consistent with studies conducted in other parts of the world, where sleep-related problems were observed in 56.8% of rheumatoid arthritis patients[16]. In addition, other studies have reported that around 70% of rheumatoid arthritis patients experience poor sleep quality and daytime fatigue[17-19].

Patients with longer disease duration were more likely to experience increased sleep disturbances than those with shorter disease duration. This finding is consistent with the present study and other related research.[17,20] The underlying mechanism linking rheumatoid arthritis disease duration and sleep disturbances is not yet fully understood. However, studies have suggested a strong connection between sleep disturbances and joint stiffness and pain. A study by Wolfe et al[8] suggested that pain is the major factor contributing to sleep disturbance in RA patients. Prolonged sleep disturbances in chronic RA patients can lead to the development of depression, which further exacerbates the quality of sleep.

The relationship between CDAI score and sleep disturbances in rheumatoid arthritis patients remains controversial. Some studies, such as that by Hirsch et al[21] have not found a significant correlation between CDAI score and sleep disturbance. However, the current study found that CDAI score was positively associated with poor sleep quality, indicating that higher disease activity may contribute to sleep disturbances in RA patients. In addition, medication can help relieve inflammation and act against inflammatory markers such as TNF-alpha, which may play a facilitating role in achieving optimal sleep duration in rheumatoid arthritis cases. However, the current study found that only a small percentage of RA patients were using optimal treatment highlighting the need for a change in disease management to improve sleep quality[22].

CONCLUSION

Patients with RA are at a higher risk of having non-optimal sleep duration, which is closely linked with their pain levels. Therefore, clinicians should be aware of this issue and strive to efficiently manage the disease to avoid any potential negative impacts on the health of patients with rheumatoid arthritis.

Conflict of interest: Nil

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