Original Article

Impact of disease activity level on sleep quality in patients with rheumatoid arthritis: A cross sectional study

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Objective: To find the impact of disease activity level of rheumatoid arthritis (RA) on sleep quality of these patients.

Methodology: In this cross sectional observational study, data were collected from 185 RA patients from Sheikh Zaid Hospital, Lahore, Jinnah Hospital, Lahore, Civil Hospital Mandi Bahauddin and Zafar Hospital, Malakwal. We used Pittsburg Sleep Quality Index (PSQI) questionnaire for quality of sleep and Disease Activity Score 28(DAS-28) scale for the activity of disease level. Diagnosed RA patients aged between 29 – 70 years of both gender with no history of other systemic illnesses were recruited into the study.

Results: Out of 185 patients, 39.5% were males and 60.5% were females. We found that 77.8% had poor sleep. Among these, 4.8% had inactive disease activity level, 12.5% had moderate disease activity level while 85% had high disease activity level. Statistically positive relation between quality of sleep and activity of disease level was $p < 0.01$.

Conclusion: Activity of disease level and quality of sleep both were strongly associated. Sleep quality was more disturbed in patients with more disease activity level.

Keywords: Disease activity level, rheumatoid arthritis, sleeps quality.

INTRODUCTION

Rheumatoid arthritis is a disorder which is categorized by swelling, discomfort in joints, lethargy, morning stiffness and disability.[1,2] There are numerous studies that reported sleep disturbance in RA patients was 54 – 70% and had issues with rest, poor rest quality, attentiveness, arousals during the night and unnecessary daytime tiredness.[3-6] It brings pain in the involved joints and cause functional limitations.[7] It is an inflammatory arthritis with highest morbidity and mortality rates.[8-10] Rheumatoid Arthritis is more common in female.[11,12] Early identification and management slows down the progression of disease in 90% patients.[13] Tendon joint fusion repair, synovectomy, total joint replacement therapy and physical therapy are important treatment options of RA in addition of pharmacotherapy.[14-17] Sleep disturbance and lethargy was commonly found in the patients because of pain and increased activity level of the disease.[18-20] The aim of this study was to find the impact of disease activity level of RA on sleep quality of these patients.

METHODOLOGY

This cross sectional observational study gathered data through non-probability convenient sampling technique from Sheikh Zaid Hospital, Lahore, Jinnah Hospital, Lahore, Civil Hospital, Mandi Bahauddin and Zafar Hospital, Malakwal. The study was completed from August 2020 to January 2021. Sample size was calculated on epitool software through strategy; "sample size calculation to estimate a single proportion (apparent prevalence)"and it was 179 according to below formula:

$$n = \frac{p \times (1-p) \times \left(z_{1-\frac{\alpha}{2}}\right)^2}{(d)^2}$$

α: Probability of first type error, α = 0.05, P: Estimation of the proportion of the desired trait P = 0.134 (according to a study conducted in korea)[21] d: Acceptable error in estimating the desired ratio d = 0.05 and confidence interval of 0.95.

We included 185 diagnosed patients of RA by certified Rheumatologists, between age ranged of 18 – 60 years of both genders and with no comorbidity. Patients having osteoarthritis, fibromylegia, fracture, trauma history, cancer, and any metabolic syndrome were excluded. An informed consent was taken from all participants and Ethical approval was granted from University Institutional Review Board, University of Lahore (IRB-UOL-FAHS/809/2021).

The study had two outcome measures including quality of sleep and disease activity level of RA. We used Pittsburgh Sleep Quality Index, made by Buysse et al[22] **(**Cronbach's alpha: 0.83, test-retest reliability: 0.85).[23] For activity level of the disease, Disease Activity Score

28, authenticated by the EULAR was used.[24]

Statistical Analysis: The data were analysed from SPSS 20. Chi-Square test was used to find out the association and impact of RA activity level on sleep quality.

RESULTS

Out of 185 RA patients, 73 (39.5%) were males and 112 (60.5%) were females. Average age was about 44.26 ± 9.26 years (range 29 – 70).

We found that 77.8% patients had poor sleep quality whereas only 41(22.2%) patients had good enough sleep in night (Table 1). Most (132 or 71.4%) patients had highly active RA (Table 2). It was found that patients who had disease severely active had poor sleep quality ($p < 0.01$) (Table 3).

Table 1: Descriptive statistics of gender and sleep quality.

Variable	Construct	Frequency	Percentage
Gender	female	112	60.5%
	Male	73	39.5%
Sleep quality	Poor Quality	144	77.8%
	Good Quality	41	22.2%

Table 2: Descriptive statistics of activity level of Rheumatoid arthritis.

Variable	Construct	Frequency	Percentage
Disease Activity Level	Inactive	19	10.3%
	Moderate	34	18.4%
	Very Active	132	71.4%

Table 3: Association of disease activity level with sleep quality in patients with Rheumatoid arthritis.

Disease Activity Level						
Variable	**Construct**	**Inactive**	**Moderate**	**Very Active**	**Total**	**P value**
Sleep Quality	Poor Sleep Quality	7	18	119	144	**0.00**
	Good Sleep Quality	12	16	13	41	
	Total	19	34	132	185	

DISCUSSION

High disease activity level was found in 71.4% patients. Strong association of disease activity level was found with sleep in current study with $p < 0.01$. A study from Turkey used the same scale and found poor quality of sleep in the patients of RA with high activity level.[5] In contrast to our study, a study found that most of the RA patients were satisfied with their sleep quality although they used a different scale for the measurement of sleep quality.[19]

Similar to the current study, another study found that higher disease activity level was associated with sleep quality.[20] By reducing the inflammatory process we can bring patients better quality of sleep. People with pain and disabilities struggles for daily activities.[3]

We suggest that if disease is moderate or severely active, then being physically active, physical therapy sessions, and regular exercise plans, its impact on patient's life quality can be lowered significantly. Educational seminars should be conducted for such patients to guide them some effective copping strategies which they can use to overcome sleep disturbances and other complications at their end.

CONCLUSION

Disease activity and sleep quality both were strongly associated. Sleep quality was more disturbed in patients with high level of disease activity.

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