

Disturbed Quality of Sleep in Patients with Rheumatoid Arthritis: Reality or Myth?

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ABSTRACT

Objective: To determine the quality of sleep and factors associated with poor sleep quality among patients suffering from rheumatoid arthritis.

Study Design: Cross sectional study.

Place and Duration of Study: Rheumatology Department, Pak Emirates Military Hospital, Rawalpindi Pakistan, from Aug 2019 to Apr 2020.

Methodology: Patient of rheumatoid arthritis who fulfilled American College of Rheumatology criteria of 2010 were included in study. Quality of sleep was determined in all the patients with the help of Pittsburgh sleep quality index (PSQI). Age, gender, duration of rheumatoid arthritis and residual pain symptoms were correlated with the presence of poor quality of sleep.

Results: Mean age of the study participants was 33.37±7.822 years. 56(22.4%) patients were male while 194(77.6%) were female. 106(42.4%) patients had good sleep quality when assessed on Pittsburgh sleep quality index while 144(57.6%) had poor sleep quality. Binary logistic regression analysis revealed that long duration of illness and residual pain symptoms had a statistically significant association with poor sleep quality the patients suffering from rheumatoid arthritis (*p*-value <0.05).

Conclusion: Poor sleep quality was a consistent finding among patients of rheumatoid arthritis which is usually not part of routine symptoms screened in rheumatology clinics. Patients without adequate response to treatment and having residual symptoms were more at risk of having sleep problems in addition to those with long standing illness.

Keywords: Correlation, Rheumatoid arthritis, Sleep quality.

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INTRODUCTION

Rheumatology clinics face high burden of patients suffering from rheumatoid arthritis around the globe.¹ Statistics have not been different in our part of the world and physicians of various specialties encounter these patients in routine due to lack of trained rheumatologist in Pakistan.² Baseline laboratory investigations, immune based tests and radiological evidences are the modalities which have been commonly used to support the clinical findings to make up the diagnosis of rheumatoid arthritis.³ Less attention has been paid on the disturbance of biological functions which get affected in this chronic illness.

Age and a lot of other circumstances including the physical and psychological health may have effect on the pattern of sleep of an individual. A lot of clinical conditions may pose direct or indirect impact on quality and pattern of sleep including the liver, renal, neoplastic and mental health illnesses.⁴⁻⁶ In order to

label a patient suffering from primary sleep disorder, detailed medical and psychiatric evaluation should be performed.

Various studies have been done in other parts of the world to look for the alteration in vital biological function of the body i-e sleep among the patients of RA. Grabovec *et al.* in 2018 performed a study with the objective to assess the quality of sleep among the patients suffering from rheumatoid arthritis and see the association of various factors with presence of poor sleep quality among these patients. Their findings were that a high percentage of study participants had sleep problems and pain and functional disability were main predictors of poor sleep quality among patients of rheumatoid arthritis.⁷ Austid *et al.* in 2017 performed a similar study and explored various factors related to sleep quality decline among the patients suffering from RA. They concluded that sleep disturbance measured by four different measures was independently related to other patient reported outcomes including fatigue, pain, and disease activity in RA patients.⁸ An interesting study was conducted by

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Mustafa *et al.* in KSA with the objective to look for the sleep problems and quality of life among patients of RA. They reported that the prevalence rates of insomnia, excessive daytime sleepiness, sleep disturbance, risk of obstructive sleep apnea, and restless leg syndrome were all quite high among the sufferers of this chronic immunological condition. Disease activity did not seem to affect the sleep of patients in their study and poor sleep did not emerge as predictor for poor quality of life as well.⁹

Epidemiological data suggest that Pakistani population has been suffering from rheumatoid arthritis with same figures as other populations of the world.¹⁰ Much work has been done on clinical and laboratory markers of this illness but less attention has been paid on alterations in biological functions like sleep, appetite and sexual health as they could be affected due to pathophysiology of disease or may be related to the medications use. We therefore planned this study with the rationale to determine the quality of sleep and factors associated with poor sleep quality patients suffering from rheumatoid arthritis presenting in general medicine/ rheumatology outpatient department at tertiary care hospital of Rawalpindi.

METHODOOGY

The cross sectional study was conducted during the period of August 2019 to April 2020 at General Medicine/Rheumatology Outpatient Department of Pak Emirates Military Hospital Rawalpindi Pakistan, Non probability consecutive sampling technique was used to gather the required sample size for this study. Sample size was calculated by using the WHO sample size calculator and keeping the population prevalence proportion at 18.5%.^{11,12}

Inclusion Criteria: Patients who fulfilled the American college of rheumatology classification criteria of RA 2010 with age between 18 and 60 years were included in this study.

Exclusion Criteria: Patients who had unclear diagnosis or those with RA as part of other broad immunological condition were excluded from the study. Pregnant or morbidly obese patients or patients with preexisting sleep problems prior to the onset of RA were also excluded from the study. Patients who were having any diagnosed psychiatric disorder or were using any kind of illicit or psychoactive substance were also not included in the study.

Ethical approval vis IREB (ltr number: A/124) was taken before the start of the study to cate for the

relevant ethical aspects. Written informed consent was taken from all the potential participants prior to administration of study proforma and relevant questionnaire. After covering all these ethical aspects patients were administered validated Urdu version of PSQI and wee asked to answer the questions according to their condition in last two weeks. Relevant socio-demographic data was obtained on a structured proforma attached to PSQI. Residual pain symptoms were considered significant if rated as more than 6 on visual analogue scale (VAS) score on any joint.

Pittsburgh Sleep Quality Index (PSQI) is a widely used instrument to assess the quality of sleep. Urdu version which has already bee validated in our population was used in our study.¹³ Cut off score of "5" or greater indicated poor sleep quality in our target population as cut of used previously in our population.¹⁴

For the purpose of statistical analysis, we used Statistics Package for Social Sciences version 23.0 (SPSS-23.0). Descriptive statistics were used for analyzing the data for this study. Two categories were made for the comparison as presence and absence of poor sleep quality. Chi-square was used to determine between group variances in categorical correlates. Binary logistic regression analysis was done to evaluate the relationship of various independent variables with the presence of poor sleep quality among our study participants. Differences between groups were considered significant if *p*-values were ≤ 0.05 .

RESULTS

In nine months of study duration after inclusion and exclusion criteria 250 were finally recruited in the analysis. Mean age of the study participants was 33.37 ± 7.822 years. Mean duration of rheumatoid arthritis among the study participants was 3.12 ± 7.358 years. 56(22.4%) patients were male while 194(77.6%) were female. 106(42.4%) patients had good sleep quality when assessed on Pittsburgh sleep quality index while 144(57.6%) had poor sleep quality. Table-I shows that Pearson chi-square test revealed that long duration of illness and presence of residual pain symptoms had a statistically significant association with poor sleep quality among the patients suffering from rheumatoid arthritis (*p*-value < 0.05) while gender and age had no statistically significant relationship with the severity of illness (*p*-value 0.247 and 0.263 respectively). Table-II shows that binary logistic regression analysis confirmed the association and there was a strong chance of patients with long standing illness and residual symptoms to have sleep problems as compared to those

without residual pain symptoms and shorter duration of illness.

Table-I: Relationship of various Factors with the Poor Quality Of Sleep (n=250)

Socio-demographic factors	Good sleep quality	Poor sleep quality	p-value
Age			
<40 years	93(66.7%)	119(41.7%)	0.263
>40 years	13(33.3%)	25(58.3%)	
Gender			
Male	20(73.7%)	36(80.5%)	0.247
Female	86(26.3%)	108(19.5%)	
Duration of illness			
<5 years	66(56.6%)	62(47.2%)	0.003
>5 years	40(43.4%)	82(52.8%)	
Residual pain symptoms			
No	68(67.7%)	54(25%)	<0.001
Yes	38(32.3%)	90(75%)	

Table-II: Factors relating to Poor Sleep Quality among the Target Population (n=250)

	p-value	OR (95% CI)
Age (ref. was 40 years or less)	0.331	1.484 (0.670-3.288)
Gender (ref. was male)	0.089	0.562 (0.290-1.091)
Duration of illness (ref. was <5 years of age)	0.005	2.155 (1.257-3.694)
Residual pain symptoms (ref. was no residual pain symptoms)	0.000	3.001 (1.758-5.125)

DISCUSSION

Immunological diseases have usually been managed by general physicians or medical specialist due to lack of trained rheumatologist and immunologist in our part of the world. Adequate knowledge about all the aspects of rheumatology diseases can only enable the doctors to manage the patients effectively and screen and pick up the cases which have symptoms or features other than core features of the underlying illness. Various psychological and physiological disturbances have been reported among the patients of RA in the past in local and foreign populations.⁷⁻¹⁵ We planned this study with the rationale to determine the quality of sleep and factors associated with poor sleep quality among the patients suffering from rheumatoid arthritis presenting to our teaching hospital from all parts of the country. This would enable to reveal the real picture associated with these patients regarding one of the most important biological functions of the body.

Wells *et al.* in 2009 published an interesting review regarding the sleep quality among patients of RA and various tools used to measure sleep problems in the target population. They came up with the findings

that multiple sleep problems regarding quality and other aspects of sleep were found in with RA patients. The striking feature of their review was they used various scales and compared their properties and ability to predict various sleep problems among the RA patients. Athens insomnia scale and PSQI were both found to valid and reliable.¹⁶ We used PSQI which was part of their review as well and poor overall quality of sleep emerged as major problem in more than half of our target patients. Sariyildiz *et al.* in 2014 conducted a study with the objective to assess the sleep quality and various factors affecting the sleep quality among the patients suffering from rheumatoid arthritis. They had interesting results showing that all the domains of sleep quality were markedly more affected among the RA patients as compared to the healthy controls. A lot of factors they found were associated on spearman’s analysis but with regression analysis only high disease activity on DAS-28 and presence of clinical depression were associated with poor sleep quality among these patients.¹⁷ Our results were not very different from them in terms of frequency of poor sleep quality and disease activity was a consistent correlate with poor sleep in their study which was significantly related to poor sleep in our analysis as well.

Son *et al.* in 2015 performed a similar study in Korea with case control design to assess the difference in sleep indices among the cases suffering from RA and the healthy controls. They used similar tool as we used for this purpose and came up with the conclusion poor sleep quality was significantly found more among the cases of RA as compared to the healthy controls.¹⁸ Around 57.6% of our patients had poor sleep quality which was quite more than the figures mentioned in Korean study. Reason may be more active disease or different psychosocial environment. This phenomenon needs more exploration in future studies.

Pain intensity had a strong relationship with presence of sleep disturbances (p -value=0.03) in a study performed by Grabovac *et al.* in 2018.⁷ Both chi-square and binary logistic regression showed that there is a strong statistically significant relationship of residual pain symptoms with poor sleep quality in our patients as well (p -value<0.001). This clearly highlights the importance of control of pain in these patients as multiple physiological and psychological issues may arise if pain remains inadequately controlled for a long period of time.

Use of subjective patient filled questionnaire poses a major imitation to this study. Though a lot of

confounding factors were either controlled or compared but still sleep can be affected by multiple factors so more strict control of confounders may generate better results. More sophisticated sleep studies, large sample size from multiple centers and a better study design may generate more accurate results.

CONCLUSION

Poor sleep quality was a consistent finding among patients of rheumatoid arthritis which is usually not part of routine symptoms screened in rheumatology clinics. Patients without adequate response to treatment and having residual symptoms were more at risk of having sleep problems in addition to those with long standing illness.

Conflict of Interest: None

Author's Contribution:

Following authors have made substantial contributions to the manuscript as under:

AAC & AF: Data acquisition, data analysis, approval of the final version to be published.

MZH & SS: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

SUM & MMS: Critical review, concept, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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