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Association between anxiety and sleep quality in periodontally healthy, gingivitis, and periodontitis patients

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ABSTRACT

Background: Periodontitis, a chronic inflammatory condition, can progressively damage the tissues that support teeth, leading to tooth loss. The present study was conducted to assess association between anxiety and sleep quality in periodontally healthy, gingivitis, and periodontitis patients.

Materials & Methods:70 patients of both genderswere divided into 2 groups of 35 each. Group I was gingivitis and group II was periodontitis group. Healthy controls (35) were put in group III. The sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI).

Results: Group I had 16 males and 19 females, group II had 18 males and 17 females. The mean sleep quality score in group I was 5.3±1.5, in group II was 6.8±2.3 and in group III was 2.1±1.0. The difference was significant (P< 0.05). Sleep quality score in age >35 years was 4.1±1.8 and in age <35 years was 5.4± 1.3. Among daily tooth brushing habit subjects was 4.5± 1.1 and occasional was 4.1± 0.7. Among males was 4.7± 2.8 and in females was 4.9± 1.7. The difference was non- significant (P> 0.05).

Conclusion: The sleep quality of periodontal patientswas significantly lower than that of healthy individuals.

Keywords: *Periodontitis,Pittsburgh Sleep Quality Index, sleep quality*

1. INTRODUCTION

Periodontitis, a chronic inflammatory condition, can progressively damage the tissues that support teeth, leading to tooth loss. Periodontitis is common among adults in the U.S., impacting more than 40% of this population.[1] Nonetheless, 11% of people globally experience severe periodontitis, which has a major impact on chewing ability, appearance, self-esteem, and overall quality of life.[2]

Sleep disorders and inadequate sleep quality have a significant impact on the body's physiological functions, weaken the immune system, exacerbate inflammation, and increase serum concentrations of inflammatory markers.[3] A lack of sleep is an environmental stressor that can increase the host's vulnerability to microbial infections. Moreover, it raises the risk of periodontal disease by amplifying inflammatory responses. Therefore, there could be a connection between sleep quality and periodontal disease.[4] It is well-established that inadequate sleep increases the risk of chronic disease progression, including diabetes mellitus, cardiovascular diseases, and other inflammatory disorders.[5]

Evidence indicates that adequate sleep helps regulate the immune system and supports its functioning.[6] Both acute and chronic lack of sleep can instigate inflammatory processes and elevate the levels of C-reactive protein, leukocyte circulation

in peripheral blood, interleukin (IL)-6, and tumor necrosis factor alpha.[7]The present study was conducted to assess association between anxiety and sleep quality in periodontally healthy, gingivitis, and periodontitis patients.

2. MATERIALS & METHODS

The study was carried out on 70 patients of gingivitis and periodontitis of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 35 each. Group I was gingivitis and group II was periodontitis group. Healthy controls (35) were put in group III. The sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI).

Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

3. RESULTS

Table: I Distribution of subjects

Groups	Group I	Group II	Group III
Status	Gingivitis	Periodontitis	Healthy
M:F	16:19	20:15	18:17

Table I shows that group I had 16 males and 19 females, group II had 18 males and 17 females.

Table: II Assessment of sleep quality score

Groups	Sleep quality score	P value
Group I	5.3±1.5	0.02
Group II	6.8±2.3	
Group III	2.1±1.0	

Table II, graph I shows that mean sleep quality score in group I was 5.3±1.5, in group II was 6.8±2.3 and in group III was 2.1±1.0. The difference was significant (P< 0.05).

Graph: I Assessment of sleep quality score

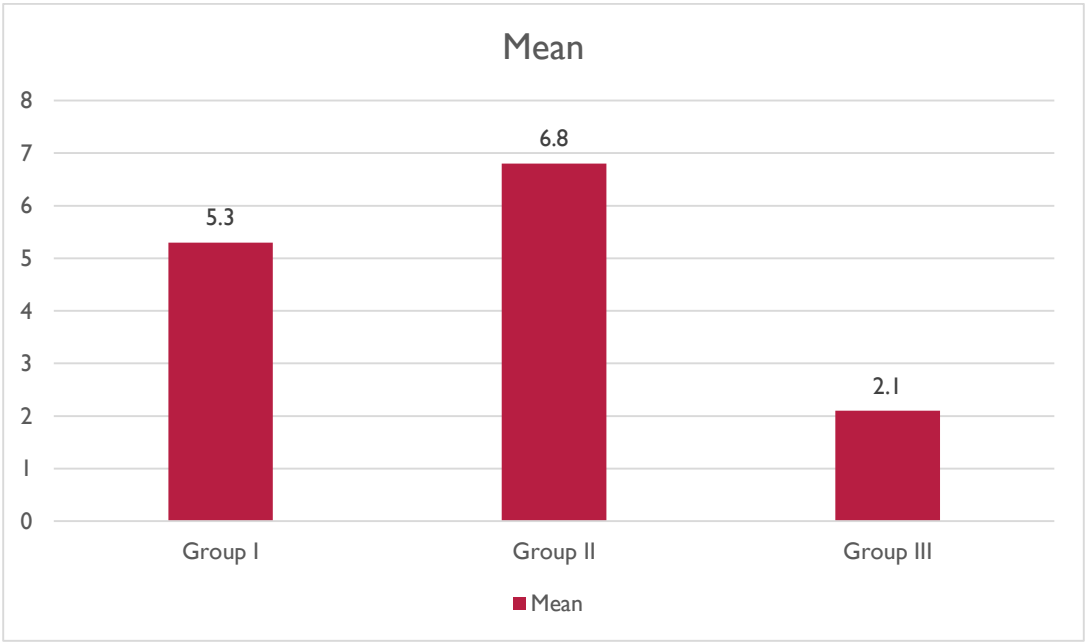

Table : III Sleep quality score based on age, gender, tooth brushing pattern and occupation

Parameters	Variables	Mean	SD	P value
Age	>35 years	4.1	1.8	0.05
	<35 years	5.4	1.3	
Tooth brushing pattern	Daily	4.5	1.1	0.18
	Irregular	4.1	0.7	
Gender	Male	4.7	2.8	0.29
	Female	4.9	1.7	

Table III shows that sleep quality score in age >35 years was 4.1±1.8 and in age <35 years was 5.4± 1.3. Among daily tooth brushing habit subjects was 4.5± 1.1 and occasional was 4.1± 0.7. Among males was 4.7± 2.8 and in females was 4.9± 1.7. The difference was non- significant (P> 0.05).

4. DISCUSSION

In recent years, increasing evidence supports the association between sleep deprivation and periodontitis.[8,9] Since periodontitis and sleep deprivation are both characterized by inflammation, numerous studies have proposed an association between sleep and periodontitis, with varying results.[10,11]

We found that group I had 16 males and 19 females, group II had 18 males and 17 females. The mean sleep quality score in group I was 5.3±1.5, in group II was 6.8±2.3 and in group III was 2.1±1.0. Kolte et al[12]evaluated the association between anxiety, quality of sleep in periodontally healthy, gingivitis, and periodontitis subjects. A total of 120 subjects were divided into three groups. Group I: 40 subjects with healthy periodontium; Group II: 40 subjects with gingivitis; Group III: 40 subjects with Stage III or Stage IV periodontitis. Clinically, parameters such as gingival index, plaque index, probing depth, and clinical attachment levels were measured. Zung Self-Rating Anxiety Scale and sleep quality scale (SQS) were used to record anxiety and sleep quality scores, respectively. The anxiety scores obtained in this trial were in the ascending orders with values of 36.02 ± 7.89, 48.15 ± 2.72, and 71.00 ± 0.98 for Group I, Group II, and Group III, respectively, indicating an increasing severity of anxiety levels. On sleep quality assessment, the score for Groups I, II, and III were 17.02 ± 6.26, 24.17 ± 7.53, and 42.12 ± 6.99, respectively, suggestive of disturbances in sleep quality. When compared between the groups, anxiety and sleep quality were found to be associated in an incremental manner from Group I to Group II and from Group II to Group III.

We found that sleep quality score in age >35 years was 4.1±1.8 and in age <35 years was 5.4± 1.3. Among daily tooth brushing habit subjects was 4.5± 1.1 and occasional was 4.1± 0.7. Among males was 4.7± 2.8 and in females was 4.9± 1.7. KamalianMehrizi F et al[13]compared the sleep quality of patients with periodontitis and their healthy counterparts. This case-control study was conducted on 106 patients with periodontitis and 106 controls with healthy periodontium. The sleep quality of the two groups was assessed by the Pittsburgh Sleep Quality Index (PSQI). Data were analyzed to assess possible correlations between the sleep quality score and demographic variables, tooth brushing pattern, and presence of periodontitis and its severity (alpha=0.05). Totally, 149 females (70.3%) and 63 males (29.7%) with the mean age of 34.17±8.29 years, participated in this study. The sleep quality score had no significant correlation with age, gender, occupation, or tooth brushing pattern (p> 0.05). However, the sleep quality had a significant correlation with periodontitis (OR= 1.15, CI 95%: 1.02-1.29, p= 0.01). The sleep quality score had no significant correlation with the severity of periodontal disease (p= 0.225). Bao Y et al[14]investigated potential sex differences between severe periodontitis and sleep. The results are presented with odds ratios (ORs) and 95% confidence intervals (95% CIs). The results of multivariate logistic regression revealed a significant association between the recommended sleep duration each night (seven to nine hours) and the prevalence of severe periodontitis in women (OR_{ad} = 0.68, p = 0.003). Furthermore, in women, urinating twice or three times per night was significantly associated with severe periodontitis (OR_{ad} = 1.44, p = 0.011), whereas the association was more significant in women who urinated at least four times per night (OR_{ad} = 1.68, p = 0.035). In men, these associations were not observed. There was no significant association between poor sleep quality and severe periodontitis, but the association differed by sex. Severe periodontitis in women was found to be significantly associated with poor sleep quality, but not in men.

The shortcoming of the study is small sample size.

5. CONCLUSION

Authors found that the sleep quality of periodontal patients was significantly lower than that of healthy individuals.

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