Irena Shlomov

“Association between quality of sleep and chronic periodontitis:

A case–control study in Malaysian population.”

DEN 1200- E601

03/05/2020

**Summary:**

Joe Yin Gan, Vijendra Pal Singh, Wei Ling Liew et al. conducted a case-control study in order to investigate the association between the quality of sleep and chronic periodontitis. The study took place in Malaysia from March to December 2016. It was published in *Dental Research Journal* in Jan- Feb 2019 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6340225/)>.

Periodontal disease, which is an inflammation caused by bacterial growth in the mouth and around the teeth and the gingival line.

This study was performed with the objective of identifying the possible relationship between periodontal diseases and the quality of sleep, the clear implication being that if poor sleep quality contributes to periodontal disease and teeth loss, measures to improve the sleep quality would prevent this disease and its terrible consequences. The study included a total of 200 participants, all individuals 21 years or older with a minimum of 16 natural teeth present. Their quality of sleep was estimated by Pittsburgh Sleep Quality Index. All individuals had comprehensive periodontal examination which included pocket probing depth, clinical attachment loss, mean plaque index and mean gingival index. The study confirmed the statistically significant association between the poor sleep quality and increased incidence of periodontal disease, with the age being the most significant factor.

**Article information:**

1. “Association between quality of sleep and chronic periodontitis: A case–control study in Malaysian population.”
2. The authors are Joe Yin Gan, Vijendra Pal Singh, Wei Ling Liew et al.
3. The article was published in *Dental Research Journal*

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6340225/>

1. Published in Jan- Feb 2019 by Wolters Kluwer –Medknow.
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6340225/>
3. The authors had financial support and sponsorship from Nil. They did not report any conflicts of interest, real or perceived, financial or nonfinancial.

**Study Analysis:**

This is a case control study conducted in Malaysia from March to December 2016. The authors conducted this study in order to investigate if there is an association between sleep deprivation or poor sleep quality and chronic periodontitis. It has been known that sleep is a complex physiological process which contributes to the general health of all the organs, as well as the maintenance of mental health. It has been shown before that periodontal disease and sleep deprivation share an increased inflammatory response and that periodontal disease contributes to chronic systemic disease such as cardiac diseases, diabetes, respiratory diseases, chronic kidney disease, rheumatoid arthritis, cognitive impairment, obesity, metabolic syndrome, and cancer. The authors of the study in discussion wanted to determine if there is an association between the hours of sleep and chronic periodontitis and if different individual factors, such as age, gender, ethnicity education and income, affect differently the relationship between sleep quality and periodontal disease.

The study patients were recruited by purposive consecutive sampling from the patients who presented to the outpatient department of a polyclinic, for dental complaints and treatment.

The inclusion criteria for the study were age of 21 or older with at least 16 natural teeth.

The exclusion criteria included smoking history, pregnancy or lactating females, known systemic disease or chronic infections, such as HIV, periodontal treatment in the last 6 months prior to enrollment and antibiotic or anti-inflammatory treatment in the last 3 months prior to enrollment.

A comprehensive clinical periodontal examination was administered to all patients and this consisted of the assessment of all teeth excluding the third molars utilizing the William’s periodontal graduated probe. The examination included pocket probing depth and clinical attachment at six points per tooth as well as mean plaque index and mean gingival index for each patient.

For accuracy and reproducibility of reporting, each patient was examined by two examiners whose reproducibility of clinical examination was demonstrated before the study.

This study was conducted over a ten-months period, from March to December 2016, as a cross-sectional study during which each patient was examined once, post enrollment.

The researches divided the selected individuals in study cases-patients who met the Centers for Disease Control and Prevention/ American Academy of Periodontology definitions for mild, moderate and severe periodontitis-while the individuals who did not meet those criteria were considered control group. The periodontal status of participants was based on all teeth excluding third molars using William’s periodontal graduated probe by two calibrated examiners.

The clinical periodontal examination included pocket probing depth (PD) and clinical attachment loss (CAL) in mm at six points per tooth the mesiofacial, midfacial, distofacial, midlingual and mesiolingual. Moreover, mean plaque index (PI) and mean gingival index (GI) were recorded for each patient. The reproducibility of the clinical evaluation between two independent examiners was provided before the study. The Cohen’s kappa score was 0.75 and 0.90 for probing depth and clinical attachment loss.

The Centers for Disease Control and Prevention/American Academy of Periodontology (CDC/AAP) definitions of periodontal disease were the following:

Mild periodontitis, specified as two or more interproximal sites with CAL ≥3 mm and at least two interproximal sites with PD ≥4 mm which was not as same tooth or one site with ≥5 mm.

Moderate periodontitis, specified as two or more interproximal sites with CAL ≥4 mm, which was not on the same tooth as well or two or more interproximal sites with PD ≥5 mm, also not on the same tooth; and Severe periodontitis, specified as two or more interproximal sites with CAL ≥6 mm not on the same tooth and one or more interproximal site(s) with PD ≥5 mm.

A 1:1 case–control ratio was used in the study and included 100 cases with periodontitis and 100 controls.

In order to correlate the periodontal disease diagnosed in the case-study individuals with their sleep status, all recruited participants were administered the Pittsburgh Sleep Quality Index (PSQI) questionnaire which is a proven instrument used to measure the quality and pattern of sleep during previous month, irrespective of the subjects’ age. The questionnaire was administered in a language which the individuals were familiar with, English, Malay or Chinese. The index consists 19 self‑rated items, grouped into seven domains: subjective sleep quality, sleep latency, sleeps duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction score, each weighted on 0–3 scale, 3 reflected the negative extreme on the scale. The seven-component of the score was then summed to produce a global score, the range was between 0 to 21. Higher scores of PSQI indicate bad quality of sleep. A global sum of 5 or higher indicated as a poor sleeper. the respondents were told that their participation was voluntary and that it was preferable to skip any questions that they were not comfortable to answer rather than giving false responses. Questionnaires that were incompletely filled were excluded from the study.

Statistical analysis was done to measure mean, standard deviation, frequency and percentage calculation using statistical software SPSS with 95% confidence interval for mean plaque index (PI), gingival index (GI), probing depth (PD) and clinical attachment loss (CAL).

Utilizing the above-mentioned sophisticated statistical models and analysis, the researchers demonstrated a strong association between periodontal disease and the poor sleep quality which seems to consistently contribute to periodontitis. Additionally, age was also positively associated with periodontitis. The other individual variables which were measured, such as sex, ethnicity, socioeconomic status did not correlate or seem to be associated with periodontal disease.

Periodontitis is a complex disease of multifactorial etiology with significant and long-term negative impact on the affected individuals’ overall physical and mental health, quality of life and longevity.

The association between poor sleep quality and increased risk of periodontitis has been suggested by a few prior studies and is supported on a theoretic basis by the finding of increased inflammation markers in sleep-deprived individuals, such as IL-6, TNF-alpha messenger RNA and others. There were however too few studies prior to the one discussed here, to reach a definite conclusion, and some of them had paradoxical results, showing an increased prevalence of periodontitis in individuals with increased period of sleep, especially in a Korean population.

The present study used high quality instruments in the assessment of the suggested association between poor sleep quality sleep deprivation and increased risk of periodontitis. The PSQI questionnaire is a validated tool in the evaluation of the quality of sleep, with a specificity of 86.5% and a sensitivity of 89.6%.

The design of the study, which required the periodontal examination be performed by two examiners before the sleep questionnaire, minimized the effect of examiner bias and the exclusion criteria mentioned above decreased the ability of confounding factors to affect the validity of the results. The findings of the present study, showing a significant association between periodontitis and the poor quality of sleep, appear therefore valid and based on scientific evidence.

The present study supported the conclusions of a few previous studies which suggested the contribution of a poor sleep quality to the development of periodontitis in Malaysian population. Utilizing strict criteria of exclusion and rigorously validated scientific protocols and tools, this study was better powered to establish the association in an authoritative manner.

The study also confirmed the association of increased age with increased incidence of periodontitis, which had been described in previous studies as well, while finding no association of prevalence of periodontitis with socioeconomic status. While this latter association is intuitively expected, the relative homogeneity in the status of the study subjects may explain the lack of finding of a correlation.

The authors recognize that given the complexity of the pathophysiology of periodontitis as well as the complexity of the sleep as a biologic phenomenon, there might be cofounding factors which may have not been accounted for by the present study.

They suggest that further studies are necessary to get an even better understanding of the objective and subjective patterns of sleep effect in the development of periodontal disease.

The prevention, detection and treatment of the periodontitis constitute an important part of the dental hygienists’ activity. In order to fulfill the mission of our profession, a thorough understanding of the causes of oral pathology and periodontitis in particular is necessary and any research which sheds more light and understanding into the progression and potential prevention of periodontal disease, contributes directly to achievement of our goals. The present study is extremely important and has immediate practical applicability since it allows us not only to diagnose and treat periodontitis but also to educate our patients and the population in general how to decrease the risk of periodontal disease by adopting healthier sleeping patterns and in the process, achieve a better quality of life. Further education of both health care providers and patients in the importance of a good quality sleep is needed and this study goes a long way towards achieving this important healthcare and social goal.