

Original Article

Evaluation of Association between Obesity and Periodontitis: An Observational Study

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ABSTRACT

Background: A number of studies have evaluated the relationship between obesity and gum disease. It has become clear that genetic and environmental factors and socioeconomic and behavioral influences leading to excess caloric intake decreased physical activity, and metabolic and endocrine abnormalities are likely important factors. Hence; we planned the present study to assess the correlation between obesity and periodontitis. **Materials & methods:** We planned the present study in the department of periodontology of the dental institute. 100 obese patients and 100 non-obese patients were included in the present study. Calculation of following clinical parameters; Gingival index, Plaque index, Pocket probing depth (PPP), and Level of clinical attachment (LCA). Difference in the levels of clinical periodontal parameters in between obese and non-obese subjects was assessed and analyzed by SPSS software. **Results:** Significantly results were obtained while comparing the clinical periodontal parameters in between obese and non-obese subjects. **Conclusion:** In comparison to the normal weighed subjects, more sever degree of periodontitis is observed in obese patients.

Key words: Chronic, Obesity, Periodontitis.

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INTRODUCTION

Obesity, one of the most significant health risks of modern society, is now recognized as a chronic disease with a multifactorial etiology. It has reached an alarming stage, current figures in New Delhi indicate that every second person fulfils the criteria of obesity or has excess abdominal fat.¹⁻³

A number of studies have evaluated the relationship between obesity and gum disease. It has become clear that genetic and environmental factors and socioeconomic and behavioral influences leading to excess caloric intake decreased physical activity, and metabolic and endocrine abnormalities are likely important factors.⁴⁻⁶ The mechanism of how obesity affects the periodontium is currently poorly understood. It is known that obesity has several harmful biological effects that might be related to the pathogenesis of periodontitis. The high prevalence of both obesity and

periodontal disease (PD) poses a substantial public health risk. Dental providers should anticipate a higher incidence of gum disease among this patient population. Many recent studies have indicated that there is a positive correlation between obesity and periodontal disease.⁷⁻⁹ Hence; we planned the present study to assess the correlation between obesity and periodontitis.

MATERIALS & METHODS

We planned the present study in the department of periodontology of the dental institute. Ethical approval was obtained from the institutional ethical committee and written consent was obtained from all the patients before the starting of the study. 100 obese patients and 100 non-obese patients were included in the present study. Inclusion criteria for the present study were as follows:

- Patients less than 60 years of age
- Patients with presence of chronic generalized periodontitis
- Patients with negative history of any other systemic illness or known drug allergy

Calculation of following clinical parameters was done based on the criteria described previously in the literature.

- Gingival index,
- Plaque index,
- Pocket probing depth (PPP),
- Level of clinical attachment(LCA).⁷⁻⁹

Difference in the levels of clinical periodontal parameters in between obese and non-obese subjects was assessed and analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

In the present study, we assessed the correlation of obesity and periodontitis. Mean age of the obese patients and non-obese patients was 39.5 years and 40.2 years respectively. Mean BMI of the patients of obese and non-obese group was 32.3 and 24.5 Kg/m² respectively. Significant results were obtained while comparing the mean BMI and waist circumference in between obese and non-obese group. Plaque index in obese patients and non-obese patients was 26.5 and 36.4 respectively. Mean gingival index of the obese and non-obese subjects was 28.6 and 31.2 respectively. Significantly results were obtained while comparing the clinical periodontal parameters in between obese and non-obese subjects.

Table 1: Demographic details

Parameter	Obese	Non-obese	P- value
Mean age (years)	39.5	40.2	0.58
Mean BMI (Kg/m ²)	32.3	24.5	0.01*
WC (cm)	97.5	54.3	0.02*

*: Significant

Table 2: Clinical parameters comparison

Parameter	Obese	Non-obese	P- value
Plaque index	26.5	36.4	0.01*
Gingival index	28.6	31.2	0.45
Probing pocket depth	37.8	28.5	0.02*
CAL (mm)	6.8	6.1	0.01*

*: Significant

DISCUSSION

Evidence suggests that obesity associated with periodontal disease seems to exist, as several studies have observed this

association in different life-course stages, since childhood to adulthood. Focusing on the biological aspects, a low-grade inflammation caused by excessive adipose tissue might be responsible for important alterations in the oral conditions.^{8,9} Hence; we planned the present study to assess the correlation between obesity and periodontitis.

In the present study, plaque index in obese patients and non-obese patients was 26.5 and 36.4 respectively. Mean gingival index of the obese and non-obese subjects was 28.6 and 31.2 respectively. Significantly results were obtained while comparing the clinical periodontal parameters in between obese and non-obese subjects. Mathur LK et al evaluated the relationship between obesity and periodontitis. A total of 300 subjects aged 20 years and above suffering from generalized periodontitis were recruited from Department of Periodontics, Pacific Dental College and Hospital, Udaipur. Periodontal status of the subjects was recorded. Body mass index and waist circumference were used as measure to assess obesity. Other variables like age, gender, oral hygiene index were also recorded. When evaluation was done for prevalence of periodontal disease according to BMI in obese and non-obese, the prevalence of periodontal disease was significantly (P=0.03) more in obese (88%) than in non-obese (74.4%) individuals. The prevalence of periodontal disease is higher among obese subjects.¹⁰

Palle AR et al correlated the association between obesity [body mass index (BMI) and waist circumference (WC)] and periodontal disease parameters. The study was of a cross-sectional design and a total of 201 patients were examined after obtaining their informed consent. Subjects who had a history of cardiovascular diseases and under treatment were included in the study. Two indicators of obesity were used: BMI and WC. The following periodontal parameters were assessed: Probing depth, clinical attachment level. The oral hygiene status of the subjects was assessed by the oral hygiene index (OHI, simplified) given by John C Greene and Jack R Vermillion. The influence of the BMI and other confounding variables on periodontitis severity was assessed by multivariate logistic regression analysis. Data were analyzed using SPSS. Significant association was seen with low density lipoproteins (LDL) and severity of periodontitis, triglyceride levels (TGL) and severity of periodontitis, cholesterol and severity of periodontitis, BMI and severity of periodontitis, OHI and severity of periodontitis. Significant association was seen with smoking and severity of periodontitis, BMI and severity of periodontitis, WC and severity of periodontitis, cholesterol and severity of periodontitis, OHI and severity of periodontitis. Obesity has been implicated as a risk factor for several conditions including cardiovascular disease, diabetes, etc. In our study the relation between measures of overall and abdominal obesity (BMI and WC) and periodontal disease showed significant association in the multivariate logistic regression analysis independent of other confounding factors. Therefore, Obesity can act as a

significant risk factor in progression of periodontitis.¹¹ Kumar S et al assess the relation between BMI and periodontal status among green marble mine laborers of Kesariyaji, in the Udaipur district of Rajasthan, India. The study sample comprised of 513 subjects aged 18-54 years, drawn using the stratified cluster sampling procedure. BMI was calculated as the ratio of the subject's body weight (in kg) to the square of their height (in meters). Periodontal status was recorded using the Community Periodontal Index (CPI). Binary multiple logistic regression analysis was executed to assess the relation between body mass index and periodontitis. The dependent variable for logistic regression analysis was categorized into control group (scores 0 - 2 of the CPI) and periodontitis group (scores 3 and 4 of the CPI). The overall prevalence of periodontal disease was 98.2%. Caries status and mean number of teeth present deteriorated with the poor periodontal status. Subjects had an increased risk of periodontitis by 57% for each 1kg/m² increase in the body mass index, which means that a higher body mass index could be a potential risk factor for periodontitis among the adults aged 18 to 54 years. In conclusion, evaluation of the body mass index could be used in periodontal risk assessment.¹²

CONCLUSION

Under the light of above obtained data, the authors conclude that in comparison to the normal weighed subjects, more sever degree of periodontitis is observed in obese patients. However; we recommend further studies for better exploration of results.

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