

Evaluation of the relationship between obesity and severity of periodontal diseases in rural population: A Study Protocol

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Abstract: *Background- Excessive accumulation of fat results into obesity. Obesity further have an adverse effect on health as it has been seen to be associated with diabetes mellitus, hypertension, heart disease like coronary artery disease, cerebrovascular disease such as hemorrhagic and ischemic stroke, metabolic syndrome like insulin resistance, some cancers such as cancer of esophagus, thyroid, kidney, uterus, colon and breast, and psychosocial problems. Also, obesity is considered to be a risk factor for periodontitis which is an inflammation of supporting periodontal structures around the tooth which results from the complex interaction between pathogenic bacteria and the host immune response. However, the impact of obesity on different severity of periodontal disease is not evaluated in rural population. Aim: To evaluate the relationship between obesity and the severity of periodontal disease in Rural population. Methodology: A total 400 obese subjects will be included in the study. Biometric parameters like age, weight, height, waist and neck circumference, subcutaneous skin fold will be evaluated. Also periodontal parameters like Plaque index (PI), Papillary bleeding index (PBI), Probing pocket depth (PPD), Clinical attachment level (CAL) and Gingival recession (REC) will be evaluated and co-relation between these parameters will be carried out. Results: A statistically significant association will be observed between BMI and periodontitis of overweight and obese study individuals having periodontitis. A positive co-relation will be observed between biometric parameters and periodontal status of obese individual. Conclusion: A significant association will be observed between BMI and periodontitis of overweight and obese study individuals having periodontitis in rural population.*

Keywords: *Obesity, Periodontitis, BMI, Obese*

Introduction

Obesity considered as a major health issue which contributes to increased morbidity and mortality¹. The incidence of obesity has increased substantially in the last few decades^{2,3}.

Obesity is a state in which there is a presence of an excessive amount of fat in the body and Overweight is the increased body weight in relation to height. Obese Individuals measurement calculated through body mass index (BMI) i.e. a person's weight divided by the square of the person's height if found over 30 kg/m² then consider as obese; the range 25–30 kg/m² consider as overweight⁴. Possible reasons for obesity is excessive food intake, lack of physical activity, family history and emotional factors. Obesity-related diseases are Hypertension, Type 2 diabetes, Cardiovascular disease, Osteoarthritis, Respiratory disorders and metabolic syndrome. Besides these, obesity has been considered as risk for periodontitis which includes loss of supporting tooth structure results from the co-relation of pathogenic bacteria and the host immune response⁵.

Khader et al⁶ in their study assessed that overweight participants had double the prevalence of periodontitis while participants with severe obesity had triple the prevalence. Fat cells were found to be limited source of function energy storage as considered that they produces more chemical signals and hormones. These may generally increase the inflammation in the body which decreases the immune status and increases more chances of periodontitis.

Till now, literature has not been found any co-relation with obesity and periodontal disease in different populations, rural population in India. Therefore present study will be undertaken to evaluate the relationship between obesity and the severity of periodontal disease in Rural population i.e patients attending the outpatient Department of Sharad Pawar Dental College, Sawangi (Meghe), Wardha, Maharashtra, India.

Objectives

1. To evaluate the association of Obesity with Periodontal disease.
2. To compare the association of Obesity with Chronic and Aggressive periodontitis
3. To evaluate the relation between obesity and different severity of chronic periodontitis (mild/moderate/severe)

Methodology

A total 400 subjects between the age range of 20-60 years, who are obese, coming to the outpatient Department of Periodontics, Sharad Pawar Dental College, Sawangi (M), Wardha, Maharashtra, will be included in study.

Inclusion Criteria

1. Subjects should be systemically healthy.
2. Subjects with Minimum of 20 teeth.

Exclusion Criteria

1. History of periodontal therapy from last 6 months before examination.
2. Previous history of antibiotic from last 3 months prior to study.
3. Subjects physically, mentally, or legally incapacitated.
4. Pregnant women and lactating mothers.

Before starting the study ethical clearance will be obtained from Institutional Ethical committee, (DMIMS, DU). All the information regarding dietary status, gingival and periodontal status will be recorded in well-designed periodontal chart with the help of mouth mirror, tweezer, calibrated periodontal probe (UNC-15 probe, Hu Friedy, Chicago USA). All the subjects will undergo biometric measurements for height and weight as follows:

1) Biometric measurements

1. Weight
2. Height
3. Age
4. Measurement of Waist circumference will be started from umbilicus till the nearest 0.1 cm by use of Gulick tape.
5. Measurement of Neck circumference (NC) will be carried out by Gulick tape from below the laryngeal prominence and perpendicular to the long axis of the neck with nearest 0.1 cm⁷. Women with NC \geq 34 cm requires an assessment of overweight status⁸.
6. Assessment of subcutaneous skin fold through a calliper
7. BMI will be measured as weight in kg/ height square in meters which estimate a person's body fat on the basis of height and weight.

2) Periodontal examination will includes:

1. "Plaque Index (Turesky-Gilmore and Glickaman's Modification of Quigley-Hein 1970)⁹.
2. Papillary bleeding index (Muhlemann H.R. 1977)¹⁰.
3. Probing pocket depth (PPD)
4. Clinical attachment loss (CAL)
5. Gingival Recession (REC)"

Diagnosis of periodontal disease will be based on classification given by **American Academy of Periodontology (1999)**¹¹ as:

1. Aggressive Periodontitis: Aggressive periodontitis is often characterised by a rapid loss of periodontal attachment related with high amount of pathogenic bacteria and an impaired immune response.
2. Chronic Periodontitis: Chronic periodontitis is the most common disease of the oral cavity which consist of chronic inflammation of the periodontal tissues caused through more accumulation of dental plaque.
Chronic periodontitis will be again classified into Mild, Moderate and Severe.

Expected Result

Patients coming to dental college in rural area are unaware of possible risk factors for periodontal disease. This study will implicate the relationship between obesity and the severity of the periodontitis that will aid in counselling the obese person. Moreover, it is already proven that periodontal disease act as a risk factor for various systemic disease which can further deteriorate the patients' health. A statistically significant association will be observed between BMI and periodontitis of overweight and obese study individuals having periodontitis. Therefore, this study will help in creating awareness as well as in motivating patients to modify their lifestyle and oral hygiene measures.

Discussion

Increase incidence of obesity has been considered as most fast emerging health issue. Obesity shows some co-relation with periodontitis due to effect of host response on systemic health. Measurement of BMI helps in assessing the obesity of individual and recommended by the WHO. Therefore this current study will be observed association between BMI and Periodontitis. However, BMI measures body weight as it cannot give accurate assessment of body composition or body fat. Mehru et al (2016) have suggested that skinfold thickness measurements are better predictors for body fat as compared to BMI alone. A

Francis et al 2017¹² in their study found positive co-relation with increase in BMI between obesity and periodontitis. It was observed that for mean BMI score of 22.45 ± 05.27 , the prevalence of periodontitis was 29.2% .

Identification of individuals who are at risk through screenings are of utmost importance^{13,14,15} . Necessary actions and prevention measures should be advised to the individual to stop the progression of obesity and periodontal disease.

Conclusion

This study will be observed between BMI and periodontitis of overweight and obese study individuals having periodontitis. Based upon the results awareness can be created amongst the obese individuals for maintenance of oral hygiene so as to prevent the occurrence of periodontitis in rural population.

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