



FASSESSMENT OF PERIODONTAL STATUS AMONG PATIENTS WITH AND WITHOUT METABOLIC SYNDROME

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Article History: Received: 12.12.2022

Revised: 29.01.2023

Accepted: 15.03.2023

Abstract:

Background: Metabolic syndrome (MeS) is common among the Indian Population. Metabolic syndrome is a cluster of conditions that occur concomitantly and together they increase the risk of cardiovascular disease and double the risk of type 2 diabetes. This study was conducted to assess the association of periodontal status among patients with and without metabolic syndrome.

Materials and Methods: This cross-sectional study was conducted among 50 patients who had visited the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai, India between March 2022-July 2022. The patients were categorised into: Group 1: patients without metabolic syndrome (25 patients), Group 2: patients with metabolic syndrome (25 patients). The periodontal status was assessed using Silness&Loe gingival index (GI), probing pocket depth (PPD), and clinical attachment loss (CAL). Independent t-test was used to compare the clinical parameters between both the groups.

Results: GI, PPD, CAL of group 1 patients were 1.55 ± 0.48 , 2.25 ± 0.56 , 1.12 ± 0.83 respectively. GI, PPD, CAL of group 2 patients were 2.01 ± 0.72 , 4.42 ± 1.20 , 5.17 ± 0.92 respectively. The difference between both the groups in terms of GI, PPD and CAL was statistically significant with $p < 0.05$.

Conclusion: Gingival index, periodontal probing depth and clinical attachment loss were higher among patients with metabolic syndrome as compared to individuals without metabolic syndrome.

Keywords: Metabolic syndrome, Periodontal status, Diabetes, Hypertension, Hyperlipidemia

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DOI: 10.31838/ecb/2023.12.s2.157

1. Introduction

Periodontal disease is an important public health problem all over the world. Periodontal diseases are caused by an unhealthy interaction between bacteria populating tooth surfaces and the tissues that attach the teeth to the bone. Periodontitis is a chronic inflammatory disease which affects both the soft and hard tissues around the tooth. The primary etiology of the disease is bacterial plaque, however the disease is associated with various risk factors including age, gender, smoking, stress, socioeconomic status, genetic factors, systemic diseases and hormonal changes. (1-9) If the condition is left untreated, it leads to increase in pocket depth, gingival recession, clinical attachment loss, bone loss, furcation involvement, pathological migration and tooth mobility eventually leading to tooth loss.

The risk of cardiovascular disease and the risk of type 2 diabetes are both increased by the collection of disorders known as the metabolic syndrome. There are several definitions of metabolic syndrome, and they might vary significantly depending on the organisation providing them. The National Cholesterol Education Program Adult Treatment Panel III offers the definition that is most frequently used. (10,11) According to this definition, an individual must possess three or more of the risk characteristics listed below. (a) an increase in abdominal circumference, (b) low plasma levels of HDL cholesterol, (c) an increase in plasma triglyceride values, (d) an increase in blood pressure, and (e) an increase in blood glucose levels. Because it is linked to insulin resistance and is a strong indicator of type 2 diabetes with new start, prediabetes is also considered as a component of metabolic syndrome. (14)

Insulin resistance and abdominal obesity seem to be the main underlying risk factors for metabolic syndrome. Physical inactivity, age, and hormone imbalance are other disorders that are related. Visceral adiposity is one of the risk variables that appears to be the main initiator for the majority of the metabolic syndrome-related pathways. Although the precise processes causing this systemic reaction are yet unknown, research suggests that the inflammatory state brought on by the metabolic syndrome is linked to endothelial dysfunction, which may raise the risk of cardiovascular disease and type 2 diabetes. (15)

The oral flora of healthy people and those with periodontitis differs dramatically, and metabolic disorders affect the gut microbiome. Changes in the gut flora have also been connected to obesity and metabolic syndrome. Additionally, obesity can affect the type 2 diabetics' oral microbiome and lower the variety of bacteria in the distal intestine. More precisely, compared to those with high bacterial richness, people with lesser microbiome diversity had more overall obesity, insulin resistance, and dyslipidemia. (16) The main aim of the study was to assess the periodontal status among the patients with and without metabolic syndrome.

2. Materials and Methods

This cross-sectional study was conducted among 50 patients who had visited the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai, India between March 2022-July 2022. The ethical clearance was obtained from the Institutional Ethical Committee and a written informed consent was obtained from all the study participants.

The patients were categorised based on the systemic health condition as follows: Group 1: patients without metabolic syndrome (25 patients), Group 2: patients with metabolic syndrome (25 patients). The periodontal status of all teeth, excluding third molars, were assessed using, gingival index (GI) of Silness&Löe (1964) , probing pocket depth (PPD), and clinical attachment loss (CAL).

The data was analysed using Statistical Package for Social Sciences (SPSS Software, Version 23.0). Descriptive and inferential statistics were done for data summarization and presentation. Mean, Standard deviations were calculated. Independent t-test was used to compare the clinical parameters between both the groups.

3. Results

GI, PPD, CAL of group 1 patients were 1.55 ± 0.48 , 2.25 ± 0.56 , 1.12 ± 0.83 respectively. GI, PPD, CAL of group 2 patients were 2.01 ± 0.72 , 4.42 ± 1.20 , 5.17 ± 0.92 respectively. The difference between both the groups in terms of GI, PPD and CAL was statistically significant with $p < 0.05$ (Table 1).

Table 1: Inter group comparison of GI, PPD and CAL

Variable	Group 1 (n=25)	Group 2 (n=25)	p value
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GI	1.55±0.48	2.01±0.72	<0.05
PPD	2.25±0.56	4.42±1.20	<0.05
CAL	1.12±0.83	5.17±0.92	<0.05

4. Discussion

The present study was done to assess the periodontal status among the patients with and without metabolic syndrome.

Beck et al., showed individuals with MeS had much more severe and extensive periodontal disease than those without MeS. However, a causal link cannot be inferred from the findings of this cross-sectional investigation (27). Shimazaki et al., reported that MeS was linked to a higher risk of periodontitis in 584 Japanese women, and people who had more MeS components had substantially higher odds ratios for more severe PD and clinical attachment loss than people who had none (28).

Pozharitskaia et al., reported that in patients with MeS, chronic generalised periodontitis exhibits an active and aggressive course. They also found a connection between the severity and degree of chronic generalised periodontitis and the blood level of immunoreactive insulin (29). In contrast, the data of Borges et al., failed to suggest a link between periodontitis and metabolic syndrome (30).

A recent systematic review and meta analysis investigated the existence and magnitude of the link between periodontitis and metabolic syndrome (31). A systematic search of the literature was conducted looking for case-control, cross-sectional, cohort studies and population surveys including patients with measures of periodontitis and metabolic syndrome. A total of 20 studies were included in the review and showed that the presence of metabolic syndrome was associated with the presence of periodontitis. However, the direction of the association and factors influencing it should be investigated by longitudinal and treatment studies.

Our results are in accordance with the previous studies as gingival index, periodontal probing depth and clinical attachment loss were higher among patients with metabolic syndrome as compared to individuals without metabolic syndrome.

5. Conclusion

Gingival index, periodontal probing depth and clinical attachment loss were higher among patients with metabolic syndrome as compared to individuals without metabolic syndrome.

6. References

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