

A Study on the Prevalence of Periodontitis among Diabetic and Non-diabetic in Patna Population

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Abstract

Background: Periodontal disease is a high prevalent disease. In the United States, 47.2% of adults >30 years old have been diagnosed with some types of periodontitis. **Objective:** The objective of this study was to study the prevalence of periodontitis among diabetic and non-diabetic individuals. **Materials and Methods:** We evaluated the periodontal status in diabetic and non-diabetic individuals in Oral Medicine and Department of Patna Dental College And Hospital from July 20, 2022, to August 10, 2022. A total of 80 (31 diabetic and 49 non-diabetic) individuals were assessed. **Results:** In our study – out of 80 subjects, 31 diabetic patients exhibit periodontitis with prevalence of 38.75%. **Conclusion:** Controlling diabetes is likely to reduce the risk and severity of periodontitis. Furthermore, evidence suggests that resolution of periodontal inflammation can improve metabolic control through large multicenter. Randomized control trials are needed to further validate findings.

Keywords: Diabetic, Fasting glucose level, Non-diabetic, Periodontitis, Post-prandial glucose level.

INTRODUCTION

Periodontal disease is a high prevalent disease. In the United States, 47.2% of adults >30 years old have been diagnosed with some types of periodontitis. Longitudinal studies have demonstrated a two-way relationship between diabetes and periodontitis, with more severe periodontal tissue destruction in diabetic patient and poorer glycemic control. The level of glycemic control is of key importance in determining increased risk.^[1] For example in the US national health and nutrition examination survey (NHANES), adults with HBA1c level of >9% had significantly higher prevalence of severe periodontitis than those without diabetes.^[2] Both type 1 and type 2 diabetes mellitus are associated with elevated levels of systemic markers of inflammation.^[3] The elevated inflammatory state in diabetes contributes to both microvascular and macrovascular complications and it is cleared that hyperglycemia can result in the activation of pathway that increases inflammation, oxidative stress, and apoptosis.^[4] Serum levels of IL6 and C reactive protein are also raised in patients with periodontitis, with IL 6 levels correlating with extent of disease. Diabetes increases inflammation in the periodontal tissue. For example, gingival crevicular fluid, levels of PGE2, and IL-1beta are higher in type1 diabetic patients with either gingivitis or periodontitis compared with non-diabetic.^[5]

MATERIALS AND METHODS

We evaluated the periodontal status in diabetic and non-diabetic individuals in Oral Medicine and Department of Patna Dental College and Hospital from July 20, 2022, to August 10, 2022. A total of 80 (31 diabetic and 49 non-diabetic) individuals were assessed. CPI probe aided by a mouth mirror was used to compare the findings of diabetics with those of non-diabetic individuals. This is the standard index to access the periodontal health status. A person was considered to be diabetic according to the criteria given by the WHO. Criteria given by the WHO to be considered as diabetic:-

- Random blood sugar - >200 mg/dL
- Fasting plasma glucose > 126 mg/dL
- 2 h Postprandial glucose >200 mg/dL
- HB1AC- more than 6%.

Patients with any other systemic diseases such as hypertension and epilepsy were not included in the study. Those who were on

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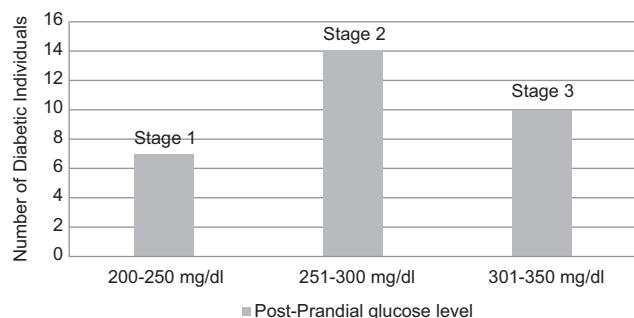
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Table 1: Prevalence of periodontitis in diabetic individuals (n=31)

Glucose level	Group A (n=7)	Group B (n=14)	Group C (n=10)
Fasting plasma glucose level	135–145 mg/dL	146–155 mg/dL	156–165 mg/dL
Post-Prandial glucose level	200–250 mg/dL	251–300 mg/dL	301–350 mg/dL
Stages of periodontitis	Stage 1	Stage 2	Stage 3

$P < 0.03$ using Chi-square test



antimicrobial medication and had undergone any periodontal therapy during past 6 month were excluded from the study.

Clinical evaluation of periodontitis includes periodontal probing to evaluate:-

1. Probing depth
2. Clinical attachment level
3. Bleeding on probing
4. Tooth mobility and furcation involvement.

The individuals who were diabetic were categorized into three groups according to the stages of periodontitis.

- Stage 1 – Initial
- Stage 2 – Moderate
- Stage 3 – Severe with potential tooth loss.

RESULTS

In our study – out of 80 subjects, 31 diabetic patients exhibit periodontitis with prevalence of 38.75%. These diabetic patients were further divided into three groups – Group A, Group B, and Group C on the basis of stages of periodontitis and sugar level (Table 1). Group A ($n = 7$) with postprandial glucose level 200–250 mg/dL shows stage 1 periodontitis. Group B ($n = 14$) with postprandial glucose level 251–300 mg/dL shows stage 2 periodontitis and Group C ($n = 10$) with glucose level 301–350 mg/dL shows stage 3. Graph showing stages of periodontitis with increased glucose level. This shows that there is strong association between periodontitis and diabetes.

DISCUSSION

In our study, results show that there is close association of periodontitis with diabetes. There is evidence from studies carried out over the past few decades.^[6,7] In the excellent reviews by Dr. Taylor in this issue^[8] that, the presence of diabetes increases the prevalence, incidence, and severity of periodontitis. If patient with diabetes has more periodontitis

than non-diabetic individuals, it would be reasonable to expect that the opposite relationship should hold true (i.e., individuals with periodontitis have a higher prevalence of diabetes than individuals without periodontitis). To test this hypothesis, data from the NHANES^[9] were examined. The epidemiological associations between periodontitis and diabetes could be the result of at least two similar but distinct pathogenic pathway: a direct causal relationship, in which the consequences of diabetes act as modifier of periodontal disease expression.^[10,11] These associations were statistically significant ($P < 0.03$) using Chi-square test. Furthermore, diabetic participants who managed their gingivitis successfully, also tended to report better glycemic control and had lower mean HbA1c level ($8.1 \pm 1.5\%$) compared with participants who did not manage their gingivitis effectively ($9.0 \pm 1.9\%$).^[12-17]

CONCLUSION

Controlling diabetes is likely to reduce the risk and severity of periodontitis. Furthermore, evidence suggests that resolution of periodontal inflammation can improve metabolic control through large multi-center. Randomized control trials are needed to further validate findings.

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