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Effects of diabetes on periodontal disease

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Abstract:

This study aimed to evaluate the effects of diabetes on periodontal disease. This casecontrol research has a cross-sectional design. A total of 1142 patients were enrolled from 2020 to 2022. (361 diabetic patients and 781 nondiabetics as controls). The patients were present in the diabetes outpatient clinic. Patients with type 2 DM who were dentate and over 45 years with fewer than six remaining teeth were included in the study. Edentulous patients were not accepted. Non-diabetic individuals who came to the outpatient clinic for other reasons served as the controls. The number of school years completed was used to determine education level. Patients who smoked cigarettes were classified as smokers, whereas those who had abstained for at least a year were classified as nonsmokers. Dental exams were carried out by dentists. The oral cavity was also examined as part of the oral health examination to determine the number and placement of teeth. There were reports of brushing and flossing. Two daily brushings, with or without flossing, were regarded as enough dental care and brushing. None of the patients we saw regularly cleaned their interdental spaces. The mean age of diabetics was 58.1 ± 3.2 vs 57.6 ± 5.1 years in the control group. The predominant sex in this study included women (51.5% of diabetics and 50.4% of the controls). There was no difference between the diabetics and controls in mean age, sex, educational level, tooth care (a least 2 times a day brushing), and smoking. There were no differences between diabetics and controls for mild or advanced illness, although moderate disease was more prevalent in diabetics.

In conclusion, Diabetics had much more moderate disease. There were no discernible changes in the DM and control groups' mean ages, sexes, educational levels, oral hygiene practices (at least twice daily brushing), or smoking habits.

Keywords: Diabetes, periodontal , patients.

Introduction:

Diabetes and periodontitis are two common health conditions that can affect individuals of all ages. While they may seem unrelated at first glance, there is a strong link between the two conditions. In this article, we will explore the connection between diabetes and periodontitis, as well as the impact that each condition can have on an individual's overall health and well-being (1).

Diabetes is a chronic condition that affects the way the body processes and uses sugar. There are three main types of diabetes: Type 1, Type 2, and gestational diabetes (2).

Type 1 diabetes, also known as insulin-dependent diabetes, is an autoimmune disorder in which the body's immune system attacks and destroys the cells in the pancreas that produce insulin. Insulin is a hormone that helps regulate the levels of sugar in the blood by allowing cells to use sugar as energy. Without enough insulin, sugar builds

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up in the blood and can lead to a range of complications, including heart disease, kidney damage, nerve damage, and blindness (3).

Type 2 diabetes, also known as non-insulin dependent diabetes, is the most common form of the disease. It occurs when the body is unable to use insulin effectively, a condition known as insulin resistance. This can lead to high blood sugar levels and an increased risk of complications(4).

Gestational diabetes is a form of diabetes that develops during pregnancy and typically goes away after the baby is born. However, women who have gestational diabetes are at an increased risk of developing Type 2 diabetes later in life(5).

Periodontitis is a type of gum disease that occurs when bacteria build up in the mouth and form a sticky film called plaque. If not removed, plaque can harden into a substance called tartar, which can lead to gum inflammation and infection(6).

Periodontitis can cause the gums to become red, swollen, and prone to bleeding. It can also cause the gums to recede, which can lead to the loss of teeth. In severe cases, periodontitis can also lead to an abscess, a pocket of pus that forms in the gum tissue(7).

There is a strong link between diabetes and periodontitis, with research suggesting that people with diabetes may be more prone to developing periodontitis. This may be due to several factors, including(8):

- High blood sugar levels: High blood sugar levels can weaken the immune system and make it more difficult for the body to fight off infections, including those in the mouth. In addition, high blood sugar levels can cause the mouth to produce less saliva, which can lead to dry mouth and an increased risk of gum disease.
- Insulin resistance: People with diabetes may have insulin resistance, which can make it more difficult for the body to control blood sugar levels. This can lead to high levels of sugar in the blood, which can increase the risk of periodontitis.
- Medications: Some medications used to treat diabetes, such as diuretics and steroids, can cause dry mouth, which can increase the risk of gum disease.

Periodontitis can have a significant impact on an individual's ability to manage their diabetes. In fact, research has shown that people with periodontitis may have a harder time controlling their blood sugar levels and may be at an increased risk of developing complications from diabetes(9).

One study found that people with periodontitis had higher levels of HbA1c, a marker for long-term blood sugar control, compared to people without periodontitis. Another study found that people with periodontitis (10).

This study aimed to evaluate the effects of diabetes on periodontal disease.

Materials and Methods:

This case-control research has a cross-sectional design. A total of 1142 patients were enrolled from 2020 to 2022. (361 diabetic patients and 781 nondiabetics as controls). The patients were present in the diabetes outpatient clinic. Patients with type 2 DM

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who were dentate and over 45 years with fewer than six remaining teeth were included in the study. Edentulous patients were not accepted. Non-diabetic individuals who came to the outpatient clinic for other reasons served as the controls.

The number of school years completed was used to determine education level. Patients who smoked cigarettes were classified as smokers, whereas those who had abstained for at least a year were classified as nonsmokers. Dental exams were carried out by dentists. The oral cavity was also examined as part of the oral health examination to determine the number and placement of teeth. There were reports of brushing and flossing. Two daily brushings, with or without flossing, were regarded as enough dental care and brushing. None of the patients we saw regularly cleaned their interdental spaces.

Statistical analysis was done by using SPSS version 23.

Results:

The demographic characteristics of 1142 patients are listed in Table 1. The mean age of diabetics was 58.1 ± 3.2 vs 57.6 ± 5.1 years in the control group. The predominant sex in this study included women (51.5% of diabetics and 50.4% of the controls). There was no difference between the diabetics and controls in mean age, sex, educational level, tooth care (a least 2 times a day brushing), and smoking.

Table 1. Diabetic Patients and control characteristics

Characters	**DM n* (%)**	**Control n* (%)**	**Total no.**
Sex: Male NO. (%) **Female NO. (%)**	175 (48.5) 186 (51.5)	387 (49.6) 394 (50.4)	562 580
Age (Mean±SE)	58.1±3.2	57.6 ± 5.1	
Educational level (Mean±SE)	4.1±0.2	3.9±0.1	
Smokers NO. (%)	278 (77)	613 (78.5)	891 (78)
Brushing NO. (%)	14 (3.9)	32 (4.1)	46 (4)
Total	361	781	1142

Table 2 shows a classification of periodontal disease according to severity. There were no differences between diabetics and controls for mild or advanced illness, although moderate disease was more prevalent in diabetics.

Table 2. Ranks Periodontal Disease by Severity

Periodontal disease	**DM n (%)**	**Control n (%)**	**Total**
Normal	26 (7.2)	73 (9.3)	99

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Mild	42 (11.6)	103(13.2)	145
Moderate	79 (21.9)	137 (17.5)	216
Sever or advanced	214 (59.3)	468 (59.9)	682
Total	361	781	1142

Discussions:

Both our patients and the controls had low levels of education. Only 4% of the patients who were included in the study had at least two daily brushings, indicating that oral hygiene was quite bad. Patients with type 1 and type 2 DM were investigated by Spangler and Konen(11) in relation to oral health practices. 74% of diabetic patients (including those with diabetes type 1 and type 2) reported brushing their teeth every day; 34% and 30%, respectively, reported flossing every day; and 23% and 40%, respectively, reported seeing the dentist at least once a year. Syrj et al.(12) observed a 50% rate for twice-day brushing, a 15% rate for daily interdental cleaning, and a 54% rate for at least yearly dental visits. Despite this, Bartold et al., (13) came to the conclusion that better dental hygiene had minimal impact on the prevalence of severe periodontal disease and that frequent, thorough subgingival debridement and ongoing monitoring of individuals at risk are essential for effective disease treatment.

The majority of our patients were smokers (78%). Smoking increases the risk of periodontal disease by nearly 10 times in diabetic patients.(14) Smoking may not only be associated with the development of periodontal diseases, but it may affect the successful outcome of periodontal treatment, and the management of diabetic patients should include strong recommendations to quit smoking.(15)

Only mild periodontal disease, as measured by pocket depth, was more prevalent in the diabetics compared to the controls. This has been made known. If the relative frequency of deep periodontal pockets was employed as the clinical criteria for periodontal disease severity, no significant relationships between DM and periodontal disease severity were discovered. (16) However, it has been shown that diabetes is highly connected with tooth loss, another disease indication.

There was no statistically significant difference in the depth of the probing pocket between the diabetic and control groups in Brazil, although there was significance for attachment loss (17). Grossi and colleagues(18) shown in a large cross-sectional research that diabetes patients were twice as likely to experience connection loss as nondiabetic controls.

Conclusion:

Diabetics had much more moderate disease. There were no discernible changes in the DM and control groups' mean ages, sexes, educational levels, oral hygiene practices (at least twice daily brushing), or smoking habits.

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