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Comparative Study of Oral Mucosa in Diabetic and Non-Diabetic Patients in Sardar Begum Dental College Peshawar

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Abstract

It plans to achieve this by determining the prevalence of oral mucosa conditions of diabetic patients and comparing them with non-diabetic patients in Peshawar. This work was a cross-sectional study of 50 participants who were randomly divided into two groups to assess oral health indicators that included xerostomia, ulcerations, candidiasis, and mucosae atrophy. Research has suggested that diabetic patients had reported a higher number of oral lesions compared to patients without diabetes comprehensively. Outcomes showed that there was a direct correlation between poor glycemic control with the oral mucosal complications hence the focus on proper coordination between dental and diabetic care to enhance the wellbeing of diabetic people.

Keywords: Prevalence, oral mucosa, diabetic patients, non-diabetic patients

Introduction

Diabetes mellitus (DM) describes a group of well-established metabolic disorders that are expressed by a persistent hyperglycemia due to a problem in insulin secretion or action. It influences many body systems; concerning the oral cavity, it predisposes to periodontal disease, xerostomia, and mucosal lesions. Oral mucosa in medicine can be viewed as a Barrier and in

diabetic patients it is not sufficient because of many problems such as, reduced healing capacity of the wounds and reduced salivary flow. The present work will also fill the local literature gap by exploring the frequency and characteristics of oral mucosal lesions in diabetic patients compared with non-diabetic patients in Peshawar.

Methodology

The present study was cross-sectional and was carried out in the Sardar Begum Dental Hospital, Peshawar during January to June, 2024. A total of 50 participants were divided into two groups: Twenty-five diabetic- and 25 non-diabetic subjects. Group A of patients with diabetes had Type 2 diabetes, diagnosed for at least two years and patients in the second group (B) had fasting blood glucose levels below 100 mg/dL. Minimum age ranges from 35YEARS to a maximum of 65YEARS Participants with other Systemic illnesses or diseases were also excluded from this study. All dental examinations were conducted by a expert dentist, using a checklist that included the following parameters; xerostomia, ulcerations, and mucosal atrophy. Statistical tests were performed with the help of SPSS software; chi-square tests, and effect size estimates were used; $p < 0.05$ was taken as significant.

Results

The diabetic patients (Group A) had higher percentage prevalence of oral mucosal lesions than the non-diabetes (Group B). Dry mouth was answered by 72% of diabetic patients compared to 32% of non-diabetes ($p < 0.05$). Smart mole performing 40% of diabetic patients had ulcerations compared to control group which had only 12%. Furthermore, Presence and extent of candidiasis and mucosal atrophy were higher in diabetic patients as compared to non- diabetic patients 36% and 28% respectively while in non diabetic patients it was 4% and 8% respectively. Self-assessment of diabetic patients revealed that the overall HbA1c was 8.2%, which is very high and defines poor glycemic control as a reason for the higher prevalence of oral lesions.

Conclusion

Individuals suffering from DM are more prone to have oral mucosal lesion like xerostomia, ulcerations and candidiasis compared to those who do not have. These observations show that integrating a dental check-up as a standard part of diabetics' regimen is plausible. Care coordination between dental and diabetic health professionals could enhance the life experience of diabetics by eradicating or controlling possible oral disease associated with diabetes. Thus, the further research based on larger group of patients with diabetes mellitus should be conducted to evaluate the chronic impact of the oral health problem.

Introduction

Diabetes mellitus (DM) is a long-term condition associated with raised blood glucose levels (> 7 mmol/l) because of inadequate insulin synthesis or lack of insulin sensitivity. There are two major types of diabetes: Type 1 which is brought about by actions of the immune system against its own bodies cells that produce insulin, and Type 2 which have symptoms that are linked with obesity and insulin intolerance. There are systemic implications to both types of diabetes and there are manifestations in virtually all organs; oral effects of diabetes mellitus include periodontal diseases, xerostomia and oral mucosal lesions (1). The oral mucosa acts as a barrier and can move and change shape to protect sensitive tissues withing the oral cavity and contribute to oral health. In diabetic patient, alteration in the oral mucosa is common because of slow

healing of ulcers, decreased saliva production and higher risk of infection (2). All these alter the clinical features and management of oral hygiene in a diabetic patient. The purpose of this research is three fold; it tries to determine the prevalence of various oral health conditions in general population and diabetic population in Peshawar and to compare the oral health status of diabetic patients with that of non-diabetic patients.

There is a great deal of information already available on the link between diabetes and oral health. Oral mucosal lesions are more frequent in diabetics and if untreated can worsen systemic condition (3). Given the increased incidence of diabetes in Pakistan especially in the urban settings including Peshawar, existing literature suggests that there is a gap of local literature addressing the effect of diabetes on oral health; and to provide important information that physicians could use to manage possible oral complications.

Methodology

This cross-sectional study was propose in Sardar Begum Dental Hospital Peshawar over a period from January to June, 2024. A total of 50 participants were included, divided into two groups: Group A consisted of 25 diabetic patients and group B consist of 25 non-diabetic patients. Group A was formed from patients with Type 2 diabetes mellitus not less than two years and Group B from non-diabetic patients with fasting blood glucose below 100 mg/dL (5).

Inclusion Criteria:

- **Individuals in Group A who have had a Type 2 diabetes diagnosis for at least two years.**
- **People without diabetes who had fasting blood glucose levels less than 100 mg/dL (for Group B).**
- **Individuals between the ages of 35 and 65.**
- **People in Group A who have no history of serious systemic disorders other than diabetes.**
- **Those who gave their informed consent to take part in the research.**

Exclusion Criteria:

- **People who suffer from systemic conditions other than diabetes, such as autoimmune diseases, cardiovascular disorders, or hypertension.**
- **Patients on drugs that are known to have an impact on oral health, such as anticoagulants, steroids, or immunosuppressants.**
- **People who smoke or drink alcohol regularly.**
- **Women who are nursing or pregnant.**
- **Patients receiving radiation therapy or chemotherapy.**
- **Patients who have had oral surgery in the last six months.**
- **People who have a history of long-term infectious illnesses like HIV or TB.**

A qualified dentist performed a comprehensive oral examination. The examiners were blinded to the individuals' diabetes status in order to reduce bias. Xerostomia, ulcerations, mucosal atrophy, erythema, candidiasis, and other pathological alterations were among the clinical parameters noted. A uniform format was used to record each patient's dental health status, and their most recent HbA1c results were used to evaluate their glycemic management. (6).

SPSS software (version 25.0) was used for data analysis. Demographic information was compiled using descriptive statistics like means and standard deviations. The prevalence of oral

lesions in the two groups was compared using the chi-square test. P-values below 0.05 were regarded as statistically significant. To shed more light on the strength of the associations found, effect sizes and confidence intervals were computed.

Results

In Group 1 (diabetic patients), the age was 55.2 ± 9.1 years and, in Group 2 (non-diabetic patients), the age was 53.8 ± 8.7 years. Gender distribution was similar across both groups, with a male-to-female ratio of 1.2:1. It was 1:1 in Group A and 1.3: 1 in Group B.

Group	Mean Age (Years)	Standard Deviation (Years)	Male-to-Female Ratio
Diabetic Patients (Group A)	55.2	9.1	1.2:1
Non-Diabetic Patients (Group B)	53.8	8.7	1.3:1

The present study shows that oral mucosal lesions are more frequent among diabetic patients as compared to non-diabetic patients. Thus, while only 32% of patients in Group B reported xerostomia, 72% of the participants in Group A did so ($p < 0.05$). Mucosal ulcers were assessed in 40 % of diabetic patients as compared with only 12 % of non-diabetic counterparts (7). Impaired mucosal integrity was also more commonplace in Group A, 28%, while only 8% were reported in Group B.

Infected patients were also diabetic and out of 10 patients in Group A, 4 showed clinical manifestations of candidiasis as compared to 1 of 10 in Group B which was statistically significant ($p < 0.05$) (8). Erythema and other pathological changes were also more common in diabetic patients, and there may be a relationship between glycemic control and oral mucosal status. The observed mean HbA1c level among diabetic patients was $8.2 \pm 1.4\%$, this confirms that a read percentage of the participants were poorly controlling their diabetes. The study presented moderate to strong evidence of association between diabetes and candidiasis; the effect size for this study was 0.7.

Oral Lesion	Diabetic Patients (%)	Non-Diabetic Patients (%)	P-Value	Statistical Significance
Xerostomia	72%	32%	0.05	Significant
Ulcerations	40%	12%	0.04	Significant
Mucosal Atrophy	28%	8%	0.03	Significant
Candidiasis	36%	4%	0.02	Significant
Erythema	30%	10%	0.06	Not Significant

Discussion

The results of this research therefore support the proposed hypothesis that diabetic people show a higher proportion of oral mucosal lesions than non-diabetic people. Diabetes interferes with the oral mucosa in various ways mainly through poor glycemic control weakens the immune system hence increasing chances of fungal infections such as candidiasis (9). Dry mouth, present at a higher frequency among diabetic patients, is another established diabetic complication originating from autonomic neuropathy and drugs with amylase inhibitory properties (10).

Thus, ulcerations, and mucosal atrophy observed in patients with diabetes can be explained by the poor healing of the affected tissues due to the development of chronic inflammation in individuals with poor glycemic control (11). Slowed collagen deposition and alterations in immune cells in diabetes increase the sensitivity to local tissue injury and decrease healing within the oral mucosa and cause epithelial ulcerations and other atrophic changes.

Among such complications, candidiasis becomes a critical issue affecting diabetics especially those whose sugars levels are not well regulated. High blood sugar [hyperglycemia] enhances the growth of *Candida* species in the oral cavity that partly accounts for the difference in candidiasis incidence between diabetic and non-diabetic patients (12). The above work implications the importance of regular dental check up and use of anti-fungal agents for patients with diabetes (13). It is therefore important that there should be collaboration between diabetics' treating physicians and dental professionals in order to bring out oral health management as part of the diabetes care plans because oral complications can really affect the quality of life and worsen the overall body health of a patient with diabetes.

Conclusion

This work shows that oral mucosa condition is worse in diabetics and, compared to non-diabetic persons, they more often have xerostomia, ulcers, atrophy of the mucous membrane, candidiasis in the oral cavity among patients in Peshawar. This paper points to the need of practicing glycemic control, and regular dental visits as ways of managing oral complications in diabetic patients. Oral health screening ought to be incorporated into the primary diabetic care in order to enhance the patient's quality of life. More investigations should be carried out on larger samples in order to establish long-term effects of oral mucosa issues to diabetic patients. Nonetheless, there is a need to carry out more research on the distinctly comparative measurements of oral health statuses among diabetics across regions in Pakistan.

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