

A COMPARATIVE STUDY ON ORAL MUCOSAL LESIONS IN PATIENTS WITH DIABETES MELLITUS TYPE 2 AND HEALTHY SUBJECTS

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ABSTRACT

Objectives: The study was carried out to assess the prevalence of oral lesions in Type 2 Diabetes Mellitus (DM) patients and a control group comprising of non diabetic healthy patients. The findings of both groups were compared.

Methods: A total of 110 patients with Type-2 diabetes mellitus (Group A) and 110 healthy patients (Group B) were enrolled in this study. Oral examination was done to assess and compare the prevalence of oral mucosal lesions in both groups. All variables were described as relative and absolute values. Frequency distribution tables were made, mean and standard deviations were calculated. Categorical variables were measured as percentages, while continuous variables were expressed as mean±standard deviation.

Results: The male-to-female ratio of patients was 1:1.68 in Group A and 1:1.75 in Group B. The mean age was 52.68±11.42 years in Group A and 52.19±12.16 years in Group B. Majority of the patients (40.91%) reported a disease duration of 10–15 years. Oral lesions were more prevalent in the diabetic group 79.09% (n=87) than in the non-diabetic group (53.64%). The most common oral lesion was the coated tongue in the diabetic (71.81%) and the control group (40.91%).

Conclusion: The prevalence of oral mucosal lesions was found to be higher in the diabetic group in comparison to the control group.

Keywords: Diabetes mellitus, Oral mucosal lesions, Complications, Prevalence.

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INTRODUCTION

Diabetes is characterized by hyperglycemia which results because of defect in insulin secretion and/or insulin action [1,2]. The disease is characterized by glycosuria, polyuria, polyphagia, and polydipsia [3]. Diabetes is broadly classified into Type I (β -cell destruction, usually leading to total insulin deficiency) and Type II (characterized by insulin resistance with relative insulin deficiency or an insulin secretory defect with insulin resistance). This disease can clinically present its features in variable regions of body.

Xerostomia, dental caries, gingivitis, periodontal disease, increased vulnerability to oral infections, burning mouth, taste disturbance, and poor wound healing are the common presenting features in oral cavity. Oral complications in diabetic patients negatively affect the quality of life [4].

The study was conducted with an aim to assess the prevalence of oral mucosal lesions in Type 2 diabetic patients and to evaluate the findings in comparison to a control group.

METHODS

A prospective study was conducted from August 2022 to December 2022. 110 patients with diabetes mellitus (DM) Type 2 reporting to UHTC associated with Shyam Shah Medical College Rewa M.P during the study period, who consented to be a part of the study were designated as Group A. Previously diagnosed diabetic patients with no other complications were included in the study. An equal number of non-diabetic individuals (assessed through fasting blood glucose level) without other illnesses and similar age were recruited as Group B (control group). Informed consent for participation was taken from the

participants after explaining the objective of the study. The exclusion criteria were pregnant mothers, immunocompromised patients, those suffering from systemic illness other than DM, patients with oral habits such as smoking, alcohol or tobacco consumption, betel nut chewing, or those who did not consent to participate. Patients with ulcerative colitis, chronic active hepatitis, myasthenia gravis, and Type 1 diabetes were excluded from the study.

The oral examination was carried out under visible light using a dental mirror and cotton gauze. For descriptive statistical analysis, all variables were described as relative and absolute values. Frequency distribution tables, means, and SD (Standard deviation) were used. Categorical variables were measured as percentages, while continuous variables as mean±standard deviation using Epi info version 7.

RESULTS

The male-to-female ratio of patients with Type 2 diabetes (Group A) was 1:1.68 (69 females and 41 males) and a similar ratio of 1:1.75 was seen in Group B (70 females and 40 males). The mean age was 52.68±11.42 years in Group A and 52.19±12.16 years in Group B. In Group A, 37.27% of participants were males and 62.73% were females and in Group B, 36.36% were males and 63.64% were females (Table 1). About 40.91% of patients reported with a disease duration of 10–15 years, followed by 23.64% of patients who reported a disease duration of 6–10 years (Table 2).

The prevalence of oral lesions was 79.09% (n=87) in the diabetic group compared to 53.64% (n=59) reported in the non-diabetic group. The most common lesion was the coated tongue in both groups. It was seen in 70.81% of patients in Group A and 40.91% of patients in Group B. It was followed by melanin pigmentation (12.73%) and fissured tongue

Table 1: Distribution (gender-wise) of patients in both groups according to age group

Age group (in years)	Number of participants Group A		Number of participants Group B	
	Males	Females	Males	Females
18-20	0	1	0	1
21-30	1	1	0	2
31-40	2	9	3	8
41-50	7	29	8	28
51-60	19	21	19	23
61-70	9	5	8	4
71-80	3	2	2	3
Above 80	0	1	0	1
Total (%)	41 (37.27)	69 (62.73)	40 (36.36)	70 (63.64%)
Mean age±standard deviations	52.68±11.42		52.19±12.16	

Table 2: Distribution of patients in Group A according to the disease status (n=110)

Duration of the disease (in years)	n	%
1-2	7	6.36
2-5	13	11.82
6-10	26	23.64
10-15	45	40.91
>15	19	17.27
Distribution of patients based on treatment		
	n	%
Oral hypoglycemic	64	58.18
Insulin	11	11
Oral hypoglycemics+insulin	25	22.73
No treatment	7	6.36
Ayurvedic/home treatment methods	3	2.73

(12.73%) in Group A. In Group B, similar findings were seen and melanin pigmentation was present in 8.18% and fissured tongue in 5.45% of patients. Lingual varicosity was seen in 8.18% of patients in Group A and 2.73% of individuals in Group B (Table 3).

DISCUSSION

Gingivitis, periodontitis, and periodontal absces are common in patients with Diabetes Mellitus [3]. In diabetic patients, periodontitis has a bidirectional effect on glycemic control. Periodontitis occurs frequently in diabetic patients with poor glycemic control and literature also suggests that a poor periodontal state can deteriorate glycemic control in patients [5].

The prevalence of caries is higher among patients with DM. This can be ascribed to a higher content of salivary glucose in diabetic patients and low salivary pH, flow rate, and calcium levels. These factors create a favorable environment for caries progression by promoting the demineralization of the tooth structure by cariogenic substances [6,7].

Epidemiological studies on oral mucosal lesions are rare in comparison to studies focusing on dental caries and periodontal diseases [8,9]. Hence, this study was conducted to study the prevalence of oral lesions in diabetic patients and compare the findings with healthy participants.

The prevalence of oral lesions was reported to be 79.09% in the diabetic group and 53.64% in the control group. Bastos *et al.*, in their study, found a statistical difference ($p < 0.001$) in the occurrence of oral soft-tissue lesions in diabetic patients (88%) and the control group (45.05%) [10]. In another study by Al-Maweri SA *et al.*, the prevalence of oral mucosal lesions was 45.5% in type 2 DM patients and 38.4% in non-diabetic control group and the difference between the groups was statistically significant ($p = 0.042$) [11].

The most common oral lesion was coated tongue in both the groups in our study which can be attributed to a decrease in salivary flow, thickened saliva, reduced action of salivary antimicrobial factors, and

Table 3: Distribution of patients in both groups according to the prevalence of oral mucosal lesions

Type of oral mucosal lesion	Group A (n=110)	Group B (n=110)
	Number of participants (%)	Number of participants (%)
Fissured tongue	14 (12.73)	6 (5.45)
Coated tongue	79 (71.81)	46 (40.91)
Geographic tongue	1 (0.91)	0 (00)
Leukoplakia	4 (3.64)	1 (0.91)
Erythroplakia	1 (0.91)	0 (00)
Melanin pigmentation	14 (12.73)	9 (8.18)
Lingual varicosity	9 (8.18)	3 (2.73)
Denture stomatitis	2 (1.82)	1 (0.91)
Traumatic ulcer	3 (2.73)	1 (0.91)
Aphthous ulcer	2 (1.82)	1 (0.91)
Smokers palate	2 (1.82)	1 (0.91)
Traumatic keratosis	1 (0.91)	0 (00)
Fordyce granule	0 (00)	0 (00)
Oral lichen planus	2 (1.82)	0 (00)
Linea alba	3 (2.73)	2 (1.82)
Oral submucous fibrosis	5 (4.55)	2 (1.82)

decreased cleaning capacity of the tongue [9]. This finding was similar to the study by Madathil *et al.* where the prevalence of coated tongue was reported to be 89.25% in the diabetic group and 65.5% in the non-diabetic group [12].

Fissuring in the tongue can affect about 5% of the general population [13]. In our study, the prevalence of fissured tongue was 12.73% in Group A and 5.45% in Group B.

The prevalence of ulcerative lesions (traumatic and aphthous) in diabetic patients has been reported to be 24.6% and 22% in studies by Silva *et al.* and Bajaj *et al.*, respectively [14,15]. However, in this study, a low prevalence of oral ulcers (4.54%) was reported in the diabetic group which was in accordance with 1% reported in the study by Madathil *et al.* [12].

A higher prevalence of leukoplakia (3.64%) and erythroplakia (0.91%) was noted in the diabetic than in the control group (0.91% and 00%, respectively) which was in accordance with the literature [16,17].

A greater prevalence of oral mucosal lesions was found in patients suffering from Type 2 DM in this study. However, the limitation of the study was a small sample size, more studies with larger sample sizes need to be conducted to establish an association between Type 2 DM and the prevalence of oral mucosal lesions.

CONCLUSION

Patients with DM are supposed to be referred to dental professionals for regular dental examinations to ensure early diagnosis and management of oral mucosal lesions. Dentists can play an essential role

in diagnosis of the diabetic status of a patient by being vigilant during the oral examination that the oral mucosal lesions in patients might be indicative of diabetes.

AUTHORS' CONTRIBUTIONS

Divashree Sharma and Medha Singh Tiwari were involved in conceptualization, methodology, data collection, data interpretation, manuscript drafting, and editing. Ambrish Mishra and Anshuman Sharma were involved in conceptualization, methodology, statistical analysis, data interpretation, manuscript drafting, editing, and review.

CONFLICTS OF INTEREST

All authors declare no conflicts of interest in publishing this article.

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