

Prevalence of oral mucosal lesions among diabetic patients in south kerala, India.

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Abstract

Aim: To evaluate the prevalence of oral mucosa lesions among diabetic patients in, South Kerala, India.

Methods: A cross-sectional observational study was conducted among diabetic patients (n=75), aged between 10-80 years, who visited a dental college during a one month period. They were interviewed regarding the history of diabetes mellitus, any abusive habits like smoking, chewing tobacco or alcoholism. Patients with type I and II diabetes were included in the study. Smokers, ex-smokers, alcoholics and patients with immunosuppressant disease associated with diabetes were excluded from the study. Gingival and periodontal diseases were not taken into account.

Result: Among the 75 diabetic patients, 50 (67%) were females and 25 (33%) males. Most of them were between the age group of 61-80 years. Most of the patients (57, 76%) subjects had oral mucosal lesions. Denture stomatitis observed in 18 (24%), followed by angular cheilitis in 11 (14.6%), fissured tongue in 9 (12%), lingual varicosities in 7 (9.3%), sialosis among 5 (6.6%), xerostomia in 4 (5.3%) and oral lichen planus in 3 (4%) subjects.

Conclusion: Denture stomatitis, angular cheilitis, fissured tongue and lingual varices are the common oral lesions; mostly associated with type II diabetes.

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Background

Diabetes mellitus is an endocrine disorder characterized by the deficiency in the production of insulin, which may be due to the pancreatic beta cell destruction (type 1) or due to an increased resistance of the tissues to insulin (type II) with alteration in the blood glucose levels [1,2]. Basically there are two types of diabetes mellitus: type I DM and type II DM. It is estimated that there are about 422 million people with diabetes mellitus worldwide according to latest 2016 data from WHO. In India, 69.1 million cases of diabetes have been reported in 2015 and 138 out of 1000 persons are diagnosed with diabetes in Kerala every year.

WHO has considered diabetes mellitus as a public health concern since 1975 [1]. Main symptoms of patients with diabetes include polyuria, polydipsia, polyphagia, weight loss, blurred vision, fatigue, tingling and numbness of lower limbs [2]. The common oral manifestations in diabetic patients include xerostomia, burning sensation, candidal infections, angular cheilitis, denture stomatitis, lichen planus, ulcerations, sialosis, gingival and periodontal problems, altered taste and glossodynia [3,4]. In 1993, the WHO included periodontal disease as a complication of diabetes.

Aim of the Study

Given the importance of the disease, and the need for deeper knowledge on oral mucosal lesions, the aim of our study was

to determine the prevalence of oral mucosal lesions among patients with diabetes mellitus in a south Kerala population.

Methods

A cross-sectional observational study was conducted among diabetic patients who visited the Department of oral medicine and radiology, Pushpagiri college of Dental Sciences, Kerala, South India during a 1-month period. A total of 75 patients were interviewed regarding the history of diabetes mellitus, any abusive habits like smoking, chewing tobacco or alcoholism. Both type 1 and type 2 diabetes mellitus were included in the study. Patients who are smokers or ex-smokers and those who consume alcohol, patients with an immunosuppressant disease associated with diabetes were excluded from the study.

Patients were clinically examined by experienced professionals in the outpatient department for oral mucosal lesions based on WHO codes.

For intraoral examination mouth mirrors, wooden spatula, and gauze were used. All the regions of the oral mucosa were examined in detail that includes lips, labial mucosa, buccal mucosa, tongue, gingiva, palate and the floor of the mouth. During clinical examination, all the mucosal findings were recorded. In the records of lesions we did not take into account the gingival and periodontal disease. The diagnoses of the lesions were based on the clinical examination and whenever necessary incisional biopsy and histopathological examination was done to confirm the diagnosis.

Results

The age of the participants in the study ranged between 10 and 80 years. Out of the 75 subjects, 42 were older than 60 and 33 were less than 60 years of age. According to the gender, 50 were females and 25 were males. All of the patients in our study had type II diabetes. Among the 75 diabetic patients, 57 (76%) subjects had oral mucosal lesions.

The most common lesion observed was denture stomatitis 18 (24%), followed by angular cheilitis 11 (14.6%), fissured tongue 9 (12%), lingual varicosities 8 (9.3%), sialosis 5 (6.6%), xerostomia 4 (5.3%) and oral lichen planus in 3 (4%) of the study population. The distributions of oral mucosal lesions are as shown in Table 1.

Discussion

Diabetes mellitus has a worldwide distribution, occurring in about 1 to 2% of the world population, mostly due to high calorie diet. This is more prevalent 85% among individuals above the age of 40 years. Only 5% of the patients develop the disease before the age of 20. According to the gender females are more commonly affected as compared to males.

Out of the 75 patients examined in our study, 42 (56%) of them were older than 60 years and 33 (44%) were less than 60 years of age. This finding is in accordance to the studies done by Marcondes et al. and Sousa et al. where 66.6% of them were females and 25 (33.4%) were males [5].

Out of the 75 patients, 57 subjects had oral mucosal lesions. The most common lesion was candidal infection. This is in accordance with the high frequency reported by Neville et al. [6]. Quirino, Birgman and Paula linked this high frequency of candida infection due to xerostomia. Diabetic patients have a high risk of opportunistic infection due to immunosuppression [7,8]. Martinez et al. also reported that 55.1% of individuals had candidal infection in diabetic patients in Mexico [9]. Around 18 (24%) subjects had denture stomatitis. The use of ill-fitting partial and complete dentures, poor oral hygiene all contribute to denture stomatitis in elderly age group.

Next common finding was angular cheilitis seen in 11 (14.6%) subjects. Guggenheimer et al. and Cristante et al. also reported a high prevalence of angular cheilitis. The main reason being

Table 1. Distribution of oral mucosal lesions according to age and gender.

Lesion	Gender	Age (in years)				Total (%)
		2-20	21-40	41-60	61-80	
Denture stomatitis	F	0	2	3	7	18 (24%)
	M	1	1	1	3	
Angular cheilitis	F	0	0	2	5	11 (14.6%)
	M	0	1	0	3	
Fissured Tongue	F	0	2	2	3	9 (12%)
	M	0	1	0	1	
Varisites	F	0	0	2	2	8 (9.3%)
	M	0	1	2	1	
Xerostomia	F	0	0	0	2	4 (5.3%)
	M	0	0	1	1	
Oral Lichen planus	F	0	2	0	0	3 (4%)
	M	0	0	0	0	

the ill-fitting and poor vertical height of the prosthesis is due to superadded candidal infection [3].

In our study the next common lesion was fissured tongue seen in 9 (12%) subjects. There is an association between diabetes and fissured tongue. The pathogenesis of fissured tongue can be developmental, as a result of aging, or changes in the environment [10]. This is in accordance with the findings of Guggenheimer et al., Yuli Muller and Yuraima where they also noticed high prevalence of fissured tongue [3].

Lingual varicosities were observed in 8 (9.3%) of the subjects, as it is seen as a common finding in elderly. It is a usual finding in elderly patients may be related to circulatory abnormalities associated with diabetic patients. The prevalence of lingual varicosities was less as compared to the preliminary studies done by Vasconcelos et al. in diabetic patients.

Sialosis has been reported among 5 (6.6%) subjects in the study group. Russoto reported that the asymptomatic increased volume of parotid gland in diabetic patients is not common [11]. Neville et al. stated that the diabetic sialosis can be seen in patients with both type of diabetes. But in our study, the prevalence was more as compared to other studies, where there are no reports of sialosis. Sialosis is caused by fatty infiltration of the interstitium and enlargement of the acinar cells and, in diabetics, is characterized by bilateral enlargement of the parotid salivary glands though the submandibular gland may also be involved. Compensatory hyperplasia of the glandular parenchyma following a declining plasma insulin concentration, and a compensatory mechanism to combat xerostomia in diabetics has been interpreted by investigators as the causes of the glandular enlargement

Xerostomia was reported also reported in 5 subjects who represent only (5.3%) of individuals studied [12]. This finding is not in accordance to the studies conducted by Ogunbodede EO et al. and Quirino MR7, which showed that xerostomia was predominant among diabetic patients [13]. Carvalho, Jorda et al. and Tofoli et al. reports that this lesion even if present is not one of the most prevalent ones. The pathogenetic mechanisms behind diabetes-related changes in salivary gland function remain unclear. Dehydration, as the result of prolonged hyperglycaemia and consequently polyuria, is considered a major cause of xerostomia and salivary gland hypofunction in diabetics [14]. Also, lymphocytic infiltrates observed in labial salivary gland tissues of patients with type 1 diabetes, indicates that the salivary gland tissue can be a target for the same autoimmune process as the pancreatic b-cells [15]. Gradual degeneration of salivary gland tissue can lead to salivary hypofunction and altered salivary composition.

Oral lichen planus was observed in 2 (4%) of the study population. This is in accordance with the studies conducted by Petrou-Amerikanous et al. where, approximately in 5% of the patients with type 2 diabetes mellitus had oral lichen planus [16]. In a study with 80 patients with oral lichen planus, 20% were diabetic showing a strong association with diabetes [17]. The same authors suggested that the duration of lichen planus lesions were significantly longer when compared with the lesions in non-diabetic patients. A meta-analysis study showed

an association between oral lichen planus with diabetes mellitus, but this association was not significant in previous studies. This could probably be because of different selecting of age, sex, type of diabetes mellitus, medications and criteria [18].

This association of lichen planus to diabetes can be due to the endocrine dysfunction in diabetes mellitus that may be related to an immunological defect and contribution to the development of oral lichen planus [16]. Antidiabetic drugs and certain antihypertensive drugs in DM patients can also cause oral lichen planus [19].

Conclusion

Diabetes is a disease that requires a deep understanding by all health care professionals. It is necessary to know how to correctly diagnose, prescribe and manage diabetic patients, thus eliminating the risk of complications and at the same time improving the quality of life of the patient. Most of the diabetic patients had at least one oral mucosal lesion. Fungal infections and tongue alterations like coated and fissured tongue were the most frequent disorders in the oral mucosa. This data emphasize the importance of dentists in monitoring the oral health of diabetic patients.

References

1. International Diabetes Federation, IDF Diabetes Atlas, International Diabetes Federation, 2015; 7th Edition.
2. American Diabetes Association Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2005;28:S37-S42.
3. J Guggenheimer, PA Moore, K Rossie, et al. Insulin – dependent diabetes and oral soft tissue pathologies, prevalence and characteristics of non- candidal lesions. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2000;30:182-192.
4. IB Lamster, E Lalla, WS Borgnakke, et al. The relationship between oral health and diabetes mellitus. *J Am Dent Assoc*. 2008;139:19-24.
5. MFA Silva, KGN Barbosa, JV Pereria, et al. Prevalence of oral mucosal lesions among patients with diabetes mellitus type 1 and 2. *An Bras Dermatol*. 2015;90(1):49-53.
6. Neville BW. *Oral and Maxillofacial Pathology* (2 edn). 2002; WB Saunders, Philadelphia, USA.
7. MR Quirno, EG Birgman, CR Paula. Oral manifestations of Diabetes Mellitus in Controlled and Uncontrolled Patients. *Braz Dent J*. 1995;2(6):131-6.
8. SV Nirmala, D Saikrishna. Dental care and treatment of children with diabetes mellitus: An overview. *J Pediatr Neonatal Care* 2016;4(2):00134.
9. RF Martinez, A Jaimes- Avelandanez, Hernandez- Perez F, et al. Oral Candida spp carriers; its prevalence in patients with type 2 diabetes mellitus. *An Bras Dermatol*. 2013;88(2):222-25.
10. FM Madani, AS Kuperstein, “Normal variants of oral anatomy and common oral soft tissue lesions; evaluation and management. *Med Clin North Am*. 2014;98(6):1281-98.
11. SB Russoto. Asymptomatic parotid gland enlargement in diabetes mellitus. *Oral Surg Oral Med Oral Pathol*. 1981;52(6):594-8.
12. PJ Lamey, AM Darwazeh, BM Frier. Oral disorders associated with diabetes mellitus. *Diabet Med*. 1992;9(5):410-16.
13. EO Ogunbodede, OA Fatusi, A Akintomide, et al. Oral health Status in a population of Nigerian Diabetics. *J Contemp Dent Pract* 2005;6(4):1-7.
14. Sreebny, A Yu, A Green, et al. Xerostomia in diabetes mellitus. *Diabetes Care* 1992;15:900-904.
15. AK Markopoulos, M Belazi. Histopathological and Immunohistochemical Features of the Labial Salivary Glands in Children With Type I Diabetes. *J Diabet Complications* 1998;12:39-42.
16. C Petrou- Amerikanou, AK Markopoulous, M Belazi, et al. Prevalence of oral lichen planus in diabetes mellitus according to the type of diabetes. *Oral Dis*. 1998;4(1):37-40.
17. N Atefi, M Majedi, S Peyghambari, et al. Prevalence of diabetes mellitus and impaired fasting blood glucose in patients with Lichen planus. *Med J Islam Repub Iran*. 2012;26(10):22-26.
18. HR Mozaffari, R Sharifi, M Sadeghi. Prevalence of Oral Lichen Planus in Diabetes Mellitus: a Meta-Analysis Study. *Acta Inform Med*. 2016;24(6):390-93.
19. R Kaomongkolgit. Oral lichenoid drug reaction associated with antihypertensive and hypoglycemic drugs. *J Drugs Dermatol*. 2010;9(1):73-5.

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