



ORAL HEALTH MANIFESTATIONS IN DIABETIC PATIENTS – A REVIEW

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Abstract

Diabetes is a systemic disorder which can cause periodontitis, dental caries and other oral conditions which include fungal infections, salivary gland dysfunction, neuropathy and mucosal disorders. Many of these lesions can be easily examined and documented by non-dental providers. The disease can affect oral cavity, eyes, nerves, kidneys, heart as well as other parts of your body. Diabetes lowers the resistance against infection and thus body becomes prone to infection, cause soreness, ulcers and the healing process also slows down. Smoking in diabetics makes these problems worse. Good blood glucose control is key to control and prevent oral problems.

Keywords: Diabetes mellitus; Infections

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INTRODUCTION

Diabetes affects millions of people each year. Diabetes mellitus is a syndrome of abnormal carbohydrate metabolism that results in acute and chronic complications due to the relative lack of or decreased insulin secretion. Diabetes mellitus is a systemic disease which can affect every system of the body.¹ The disease can affect oral cavity, eyes, nerves, kidneys, heart as well as other parts of your body. Diabetes lowers the resistance against infection and thus body becomes prone to infection, cause soreness, ulcers and the healing process also slows down. Smoking in diabetics makes these problems worse. It can cause profound effects upon oral tissues. In addition to elevated glucose levels, many other pathophysiological changes in diabetics increase the risk of periodontal disease.¹⁻⁴ Maintenance of proper oral hygiene for good oral health is an accepted part of

the normal recommendations for a healthy lifestyle. Poor oral hygiene is associated with gingivitis, which can progress to more severe infection and inflammation leading to periodontitis. The dentist plays a major role with other members of the health team in helping a patient maintain glycemic control by achieving optimal oral health and by referring undiagnosed patients with complications suggestive of diabetes to physicians for further evaluation. Prevalence of diabetes is pandemic in both developed and developing countries. In 2000, there were an estimated 175 million people with diabetes worldwide and by 2030 the projected estimate of diabetes is 354 million. In India alone, the prevalence of diabetes is expected to increase from 31.7 million in 2000 to 79.4 million in 2030.⁵ The most common oral health problems associated with diabetes are⁶

- Tooth decay
- Periodontal (gum) disease

- Salivary gland dysfunction
- Fungal infections
- Lichen planus and lichenoid reactions (inflammatory skin disease)
- Infection and delayed healing
- Taste impairment
- burning mouth syndrome
- premalignant lesions and malignancy

Tooth Decay

Tooth decay or dental caries is a bacterial infection of the mouth that can result in demineralisation of teeth that further lead to cavity formation. Patients with diabetes are susceptible to periodontal and salivary disorders which increases their risk of developing new and recurrent dental caries.⁷ But the probability of detecting an increased prevalence of dental caries in patients with type 1 diabetes is more controversial.⁸⁻¹⁰ The basic factors are the presence of the causal microorganism, the host (tooth), substrate (diet) and immune capacity of the patient. The microorganisms associated with dental caries were studied by Twetman et al¹¹ in diabetic patients and reported a high proportion of *Streptococcus mutans* in the aerobic flora of the oral cavity. Other authors^{12,13} have reported a decrease in the presence of salivary lactobacilli, due to the diet prescribed in such patients.

Periodontal Diseases

70% of the diabetic people develop periodontal disease. Periodontal diseases are inflammatory in nature and they may alter glycemic control. It has been remarked that the periodontium is a richly vascularised end organ, similar in many respects to the retina and the glomerulus.⁵ Thus, like other complications of diabetes, periodontal disease is also linked to glycemic control. Glycemic control is the best protection against periodontal disease. Studies have shown that diabetic patients with periodontal infection have a greater risk of worsening glycemic control over time compared to diabetic subjects without periodontitis.¹⁴

Salivary Gland Disinfection

Increased prevalence of dry mouth (xerostomia) has been reported in diabetic patients due to poor blood glucose control or use of specific medications (such as tricyclics for neuropathic pain). The mechanism of reducing salivary flow in diabetic patients is thought to be the result of dysfunction of autonomic nerve or microvascular

changes that affect the ability of salivary glands to respond to neural and hormonal stimulation.^{15,16} Other causes may include dehydration or adverse effects of drug therapy commonly used in diabetic patients (e.g. diuretics, antidepressants, antihypertensives). Xerostomia is reported to occur in 40–80% of diabetic patients and is related to decreased salivary flow rates, particularly in unstimulated whole saliva (the combination of secretions from all the salivary glands in the mouth).¹⁷⁻¹⁹ Flow rates have been reported to be significantly lower in patients with poorly controlled diabetes^{18,20} compared to patients with controlled diabetes or nondiabetic patients. Lack of adequate saliva leads to an increased risk of oral yeast infections, increased caries rate and difficulty in maintaining oral hygiene, as well as decrease in quality of life because of discomfort during eating, swallowing and talking.²¹

Tongue Abnormalities

After periodontal tissues, tongue is the most frequently affected in diabetic patients. A unique condition in which an atrophic “bald” spot is located at the midline of the tongue, posterior surface of the tongue, anterior to the V-shaped circumvallate papillae, called as median rhomboid glossitis. It is commonly smooth and flat, but may be depressed or have a lobular to papillary surface. It is a recognized manifestation of chronic candidiasis. In a study conducted among 176 diabetic patients,²² atrophy of the tongue was found in 26.9% of the patients, with almost all patients appearing as central papillary atrophy. In another study,²³ median rhomboid glossitis was significantly more prevalent in diabetic patients than in nondiabetic patients and was associated with elevated levels of *Candida pseudohyphae* in oral smears and diabetic complications of nephropathy and retinopathy.

Oral Candidiasis

The combination of a decreased flow rate of saliva and immune deficiency greatly increases the risk of oral candidiasis with significantly high rates of candida carriage in patients with diabetes compared to non diabetic patients.^{24,25} This may also be the result of increased salivary glucose levels, which promote over-growth of *Candida*,^{26,27} with decreased antifungal immunoglobulins in saliva caused because of diabetes.²⁸

Oral Lichen Planus and Lichenoid Drug Reactions

White patches of the mucosa that do not wipe off is a sign of a condition known as lichen planus, a chronic subepithelial inflammatory disorder that results in a characteristic lesion or patch-like white pattern over inflamed mucosa. Although, exact etiology is unknown, but the presence of this mucosal disease has been frequently associated with diabetes.^{29,30} However, a similar mucosal change called lichenoid drug reaction occur as an adverse side effect of medications that diabetic patients are commonly prescribed.³¹ These include hypoglycemics and antihypertensive medications.³⁰ Lichen planus or lichenoid reaction causes pain, burning sensation and sensitivity to acidic foods. They are associated with an increased risk for dysplastic or cancerous transformation³²

Burning Sensation of the Oral Mucosa

A burning sensation of the oral mucosa is a frequent complaint in diabetic patients as oral mucosal conditions such as Candida infections, lichen planus and dryness can cause burning sensations in diabetic patients.³³ The burning sensations in diabetic patients are frequently accompanied by impairment of taste (dysgeusia) or other sensory distortions.³⁴⁻³⁶ Additionally, neuropathic patients with peripheral diabetic neuropathy are more likely to suffer from burning sensations in oral tissues than those without peripheral neuropathy.³⁷ Therefore, information about sensations of burning in the oral mucosa will be helpful to diagnose the possible presence of candidiasis, lichen planus, oral dryness, or neuropathy.

Oral Cancer

Patients with diabetes are at a higher risk for oral cancer occurrence than patients without diabetes, particularly patients with habits of smoking tobacco and alcohol intake.³⁸⁻⁴⁰ Lesions of the dorsal surface of the tongue are unlikely to be cancerous but should be referred to the dental hospital for diagnosis and treatment. However, the occurrence of a lesion of the lateral or ventral tongue, whether it is white or red or a non-healing ulceration is always a concern and should be referred immediately to rule out squamous carcinoma.⁴¹ This recommendation also applies to lesions occurring in other areas of high cancer risk such as the floor of the mouth and tonsillar areas.

Effects of Smoking

There is a substantial evidence that the presence of a smoking habit in diabetic patients significantly increases not only the risk of oral cancer, but also the risk periodontal disease⁴² along with mucosal disorders of any type.^{43,44} These factors thus support frequent thorough oral examinations and regular oral care, as well as smoking cessation programs in the management of oral mucosal and periodontal disease in diabetic patients with smoking habit.

CONCLUSION

Patients with diabetes should visit dentist every 3 months. Health care professionals should Recognize periodontal disease as a chronic inflammatory disease with systemic ramifications, Assume patient with diabetes is at risk for periodontal disease, Refer for periodontal screening, Educate patients on the importance of oral health and regular dental visits.

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