

# Diabetes and Oral Health: A Review

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## Abstract

A healthy mouth is important for everyone, but high blood sugar can make it harder to keep mouth healthy. Diabetes mellitus is a major source of morbidity and mortality and a global epidemic that should be taken very seriously. Diabetes Mellitus is a chronic, non-communicable metabolic disease characterized by abnormalities in insulin production, action, or both. The prevalence of diabetes mellitus, a prevalent systemic disease, is rising in the modern world. Diabetes is a prevalent illness that has an effect on dental care due to its concurrent oral symptoms. This review aims to provide an overview of diabetes prevalence, symptoms, diagnosis, and treatment options, along with dental care considerations for those with the condition. The general population and people who have diabetes have demonstrated an unacceptable level of awareness regarding the bidirectional association between diabetes mellitus and general oral health, while physicians and dental practitioners have a satisfactory level of understanding.

**Keywords:** Oral Health, Dental caries, hyperglycemia, diabetes mellitus, salivary dysfunction, periodontal disease, infection, awareness, and a multidisciplinary approach

## Introduction

Diabetes is a well-known chronic systemic illness characterized by elevated blood glucose levels mostly brought on by low insulin levels or improper insulin action. Type 1 diabetes mellitus, or insulin-dependent diabetes (IDDM), and type 2 diabetes mellitus, or Non-insulin-dependent diabetes, are the two primary categories into which diabetes is typically classified (NIDDM) And Gestational diabetes (diabetes while pregnant) Adolescents and younger people are more likely to develop type 1 diabetes because of total insulin insufficiency brought on by the pancreatic  $\beta$ -cells' degeneration. 90-95% of diabetics have type 2 diabetes, which is mostly caused by insulin resistance in adults. Symptoms of diabetes for both types 1 and 2 are common with hyperglycemia, polyphagia, polydipsia, and polyuria. Complications of diabetes mellitus have been seen in the long-term comprise of neuropathy, nephropathy, retinopathy, genitourinary, cardiovascular, and sexual dysfunction. Cardiovascular manifestations mainly include hypertension, atherosclerosis, peripheral vascular disease, and cerebrovascular disease Research has shown that the oral cavity is one of the body's systems that can be impacted by diabetes. Common symptoms include dental caries, an inhibition of salivary flow, diseases of the oral mucosa such as glossodynia, lichen planus, candidiasis, xerostomia, burning mouth

syndrome, recurrent aphthous stomatitis, and most significantly, delayed wound healing, tongue abnormalities, halitosis gingivitis and periodontitis.

### **Diabetes Symptoms**

- Urinate (pee) a lot, often at night
- Are very thirsty
- Lose weight without trying
- Are very hungry
- Have blurry vision
- Have numb or tingling hands or feet
- Feel very tired
- Have very dry skin
- Have sores that heal slowly
- Have more infections than usual

### **PREVALENCE AND INCIDENCE OF DIABETES-**

The prevalence of diabetes has risen by 30 to 40% over the last 20 years, and as the population ages, so too will the burden of diabetes and its complications.

At any age, obesity is a significant risk factor for the development of diabetes, and throughout the past 20 years, there has been a noticeable rise in the proportion of overweight kids and teenagers. In conclusion, diabetes is a medical condition that is on the rise and that can impact individuals of all ages. It also has associated morbidity and death.

### **Prevalence of the most common oral diseases**

**Periodontal diseases-**A majority of any population in the world suffer from periodontal disease (gum disease). The reversible form, gingivitis, manifests itself as bleeding and swelling of only the soft tissues around the teeth and affects 50%–90% of the adult population worldwide

Other disease like Caries, Tooth loss, Periapical lesions, Peri-implant diseases, Early tooth eruption, Dry mouth, Candidiasis, Delayed wound healing, Iron precipitation in dental tissue, Oral cancer etc.

### **Diabetes systemic complications:**

**Diabetic neuropathy-**Diabetic neuropathy is a type of nerve damage that can occur if you have diabetes. High blood sugar (glucose) can injure nerves throughout the body. Diabetic neuropathy most often damages nerves in the legs and feet.

**Diabetic retinopathy-**Diabetic retinopathy is a diabetes complication that affects eyes. It's caused by damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina).

**Diabetic nephropathy-**Diabetic nephropathy is a serious complication of type 1 diabetes and type 2 diabetes. It's also called diabetic kidney disease. Diabetic nephropathy slowly damages the kidneys' filtering system. Early treatment may prevent this condition or slow it and lower the chance of complications. Diabetic kidney disease can lead to kidney failure.

**Oral manifestations in patients with diabetes mellitus-**Dry mouth (xerostomia), tooth decay (including root caries), periapical lesions, gingivitis, periodontal disease, oral candidiasis, burning mouth (especially glossodynia), altered taste, geographic tongue, coated and fissured tongue, oral lichen planus

(OLP), recurrent aphthous stomatitis, increased susceptibility to infections, and impaired wound healing are among the oral manifestations and complications associated with diabetes mellitus.

### **Diagnosis**

Clinicians can evaluate the blood glucose control of their patients using a variety of diagnostic methods. The fasting plasma glucose (FPG) test gauges blood glucose levels after a minimum of eight hours without consuming any calories. FPG levels of 5.6 mmol/L or less are regarded as normal. The hemoglobin A1C (HbA1c) test yields data on the three months' average blood glucose levels. Clinicians utilize this test, which is expressed as a percentage, to evaluate DM control and management. A normal HbA1C level in a healthy, non-diabetic patient is 5.7% or less.

### **Dental Management Considerations-**

Dentists need to be aware of crucial dental management issues before beginning treatment for a diabetic patient. By doing this, the dental surgeon can lessen the possibility of an oral diabetes consequence of the condition and the risk of an intraoperative diabetic emergency.

The first step in treating a diabetic patient effectively is for the dentist to perform a system assessment and obtain a complete medical history. The patient's recent blood glucose levels, at-home monitoring habits, frequency of HbA1C tests and their results, and frequency of hypo- or hyperglycemic episodes should all be gathered by dentists. Additionally, the dentist should go over the current DM management plan, which includes all medication dosages and schedules as well as any dietary or activity modifications.

- Consult with patient's physician to assess diabetes control.
- Update medical history and medications and review systems at each appointment.
- Confirm that patient has eaten and taken medications before initiating treatment.
- Anticipate and be prepared to manage hypoglycemia.
- Prevent, treat and eliminate infections promptly.
- Do not use or recommend aspirin-containing compounds.
- Achieve profound local anesthesia.
- Ensure excellent oral hygiene and provide profound preventive care.
- Reinforce regular diet and medication regimen before and after dental appointments.
- Take glucometer reading if patient is high risk, on insulin or having surgery.

### **Conclusion**

According to recent estimates, 318 million individuals globally are thought to have diabetes. Any dentist practicing in India would surely see a lot of patients with DM throughout the course of their career. Given the wide range of oral symptoms of diabetes mellitus and the potential for an intraoperative diabetic emergency, it is critical for dental professionals to understand the disease's effects on dental treatment. By having a comprehensive awareness of diabetes mellitus (DM) and its dental management implications, the dental healthcare team can collaborate efficiently to deliver superior oral health care to patients with diabetes. Dental health and diabetes are negatively correlated in a vicious cycle. DM has an adverse effect on the majority of oral illnesses and ailments. The administration of non-surgical periodontal therapy and the extraction of teeth affected by periodontitis or pulpal necrosis resulting from significant dental caries decrease blood levels of inflammatory markers and glycated hemoglobin.

Missing or moving teeth can make it difficult to consume a healthy diet, which can result in malnutrition and a lower quality of life due to oral health issues. Additionally, replacing lost teeth by prosthodontics with fixed bridges or dentures may enhance eating habits, food preferences, self-esteem, and overall quality of life.

Healthcare practitioners have a new weapon at their disposal for managing and preventing diabetes of any kind awareness of the critical role that oral health plays in the disease.

Diabetes mellitus (DM) screening in dentistry and oral health education in medicine, when combined with appropriate reciprocal referrals and possible co-management of patients by both medical and dental professionals, should have a good chance of improving mutual patients' quality of life as well as their overall health.

## REFERENCES

1. American Diabetes Association. (2010). Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 33(Suppl 1):S62–69. doi:10.2337/dc10-S062
2. Al Qahtani NA, Joseph B, Deepthi A, Vijayakumari BK. Prevalence of chronic periodontitis and its risk determinants among female patients in the Aseer region of KSA. *J Taibah Univ Med Sci* 2017;12:241–8. <https://doi.org/10.1016/j.jtumed.2016.11.012>
3. Adams PF, Hendershot GE, Marano MA. Current estimates from the National Health Interview Survey, 1996. Hyattsville, Md.: National Center for Health Statistics, Vital Health Statistics; 1999:10(200).
4. Diabetes Canada Clinical Practice Guidelines Expert Committee, Punthakee Z, Goldenberg R, Katz P. Definition, classification and diagnosis of diabetes, prediabetes and metabolic syndrome. *Can J Diabetes*. 2018;42(Suppl. 1):S10-5.
5. Gosmanov AR, Gosmanova EO, Dillard-Cannon E. Management of adult diabetic ketoacidosis. *Diabetes Metab Syndr Obes*. 2014;7:255-64.
6. Al-Maskari AY, Al-Maskari MY, Al-Sudairy S. Oral manifestations and complications of diabetes mellitus: a review. *Sultan Qaboos Univ Med J*. 2011;11(2):179-86.
7. McKenna SJ. Dental management of patients with diabetes. *Dent Clin North Am*. 2006;50(4):591-606.
8. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. *Lancet* 2005;366:1809-20. [https://doi.org/10.1016/S0140-6736\(05\)67728-8](https://doi.org/10.1016/S0140-6736(05)67728-8)
9. Khan T. Oral manifestations and complications of diabetes mellitus: a review. *Int J Med Health Res*. 2018;4:50–52. doi:10.22271/ijmhr
10. Al-Maskari AY, Al-Maskari MY, Al-Sudairy S. Oral manifestations and complications of diabetes mellitus: a review. *Sultan Qaboos Univ Med J*. 2011;11(2):179–186.
11. Mohanty S, Mohanty N, Rath S. Analysis of oral health complications in diabetic patients – a diagnostic perspective. *J Oral Res*. 2018;7(8):278–281. doi:10.17126/joralres.2018.072
12. Poudel P, Griffiths R, Wong VW, et al. Perceptions and practices of diabetes educators in providing oral health care: a Qualitative Study. *Diabetes Educ*. 2018;44(5):454–464. doi:10.1177/0145721718796055

13. Davis TME, Bruce DG, Curtis BH, Barraclough H, Davis WA. The relationship between intensification of blood glucose-lowering therapies, health status and quality of life in type 2 diabetes: the Fremantle Diabetes Study Phase II. *Diabetes Res Clin Pract.* 2018;142:294–302. doi:10.1016/j.diabres.2018.05.047
14. Jain A, Chawla M, Kumar A, et al. Management of periodontal disease in patients with diabetes—good clinical practice guidelines: a joint statement by Indian society of periodontology and research society for the study of diabetes in India. *J Indian Soc Periodontol.* 2020;24(6):498–524. doi:10.4103/jisp.jisp\_688\_20
- Badiah B. A preliminary survey on awareness of periodontal risk and oral health practices among diabetic patients in hospital Kuala Lumpur. *Malaysian Dent J.* 2012;34(1):1–7.