

# RSSDI Indian Diabetes

EDUCATOR JOURNAL



**Theme of the Month**

**Diabetes and Oral Health**

To keep Members Diabetes Care team abreast about  
DSME /DSMS - (Diabetes Self management Education / Support) Concepts

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## FOREWORD

Research Society for the Study of Diabetes in India (RSSDI) founded by Prof MMS Ahuja in the year 1972 is the biggest scientific association of healthcare professionals involved in promoting diabetes education and research in India. RSSDI is happy to collaborate with USV to support their endeavour to make India the 'Diabetes care capital of the world'. Through this collaboration, RSSDI would like to strengthen the cadre of diabetes educators by empowering them with recent updates in diabetes management helping bridge the gap between the physician and the patient. Today, the rule of 50% is prevailing in terms of awareness, detection, treatment and control in T2DM. Our aspiration is to achieve 90-90-90-90 i.e. 90% of people with diabetes should be made aware, 90% should be detected, 90% of those detected should be treated, and 90% of those treated should reach their goals.

Indian Diabetes Educator Journal (IDEJ) is the first of its kind in India, and the longest running monthly diabetes educator journal since April 2015 & continues its endeavour to spread awareness, knowledge and enable healthcare teams to manage individuals with diabetes and empower them for self-care. RSSDI IDEJ will continue to keep the members of diabetes care team abreast with concepts of Diabetes Self-Management Education/Support (DSME/S) with a reach of 44000 doctors and diabetes educators digitally.

People with diabetes who have uncontrolled blood glucose levels have a higher risk of tooth issues and gum disease. Awareness about the oral complications of diabetes is poor and so this month's IDEJ aims to propagate information about maintaining good oral health while having diabetes and how to prevent complications of the mouth cavity in association with high blood glucose levels. We hope this journal will help to spread awareness about oral health and its importance in people with diabetes.

We sincerely thank our contributors for making this issue delightful reading for our readers. We dedicate this journal to all the healthcare professionals who are working relentlessly towards making "India–The Diabetes Care Capital of the World."

Sincere Regards,

Dr. Sanjay Agarwal  
RSSDI Secretary

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# Expert Contributors

## of the month



### **Dr. Parag Shah**

**MBBS, MD Medicine, D. M. (Endocrinology), DNB (Endocrinology)**

Consultant Diabetologist & Endocrinologist, Gujarat Endocrine Centre, Gujarat

**Article:** Oral Health and Diabetes



### **Dr. Prem Narayanan**

**MBBS, MD (Med), DM (Endocrinology)**

Consultant and Head of Dept, Ahalia Diabetes Hospital, Palakkad

**Article:** Diabetes and Risk of Oral Cancer



### **Dr. M. Surendra Nehru**

**MBBS, MD General Medicine**

Senior Consultant Physician, Surendra Nehru Hospitals, Telangana

**Article:** Oral Health Status and Diabetes Mellitus in Patients with Cardiovascular Diseases



### **Dr. Aushili Mahule**

**BDS, MDS, PGDCR**

Medical Advisor, USV Pvt Ltd, Mumbai

**Article:** The Role of Dentist in Diagnosis and Awareness of Diabetes



### **Dr. Abhishek Arun**

**MBBS, MD, M Med, MRCP, FRCP, MAMS, Phd, Fellowship in diabetes**

Consulting Diabetologist & Metabolic Physician, Vishudh Diabetes Clinic, Lucknow

**Article:** The Significance of Diet in Maintaining Oral Health in Diabetes



### **Dr. Sucheeth Avanti**

**MBBS, MD Geriatrics**

Consulting Diabetologist, Cardiologist & Intensivist, Ashtvinayak Hospital, Navi Mumbai

**Article:** Diabetes Tongue



# Table of Content

Cover story: Oral Health and Diabetes

01

*Dr. Parag Shah*

The Significance of Diet in Maintaining  
Oral Health in Diabetes

16

*Dr. Abhishek Arun*

Frequently Asked Questions

05

Diabetes Tongue

18

*Dr. Sucheeth Avanti*

Diabetes and Risk of Oral Cancer

07

*Dr. Prem Narayanan*

Diabetes Educator Tip of the Month

21

*Ms. Samrin Khan*

Did You Know?

10

Superfood: Red Lentils (Masoor)

22

Facts and Figures

11

Recipe: Red Lentil Soup

24

What's Trending? Oral Health Status  
and Diabetes Mellitus in Patients with  
Cardiovascular Diseases

12

*Dr. M. Surendra Nehru*

Dia-Games

25

The Role of a Dentist in Diagnosis and  
Awareness of Diabetes

14

*Dr. Aushili Mahule*

Patient Speaks

26

# Cover Story: Defining the 3 R's of Diabetes



## Dr. Parag Shah

**MBBS, MD Medicine, D. M. (Endocrinology),  
DNB (Endocrinology)**

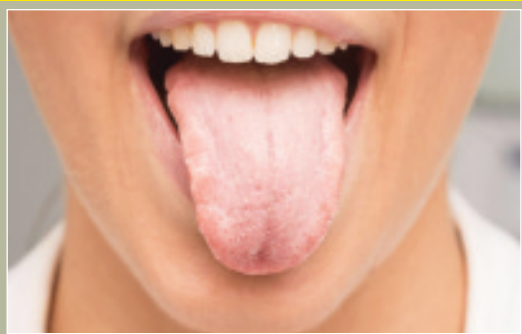
Consultant Diabetologist & Endocrinologist,  
Gujarat Endocrine Centre, Gujarat

Diabetes mellitus (DM) is a chronic metabolic condition characterized by hyperglycemia caused by either a lack of insulin secretion, a resistance to the action of insulin, or both. Blood glucose regulation is crucial because chronic hyperglycemia can cause damage to various organs such as the eyes, heart, kidney, blood vessels, nerves, etc. These

are the well-known micro- and macro-vascular complications of diabetes. However, hyperglycemia can also manifest many issues in the mouth cavity which are often not associated with diabetes but actually are! Impaired neutrophil function, increased collagenase activity, a decrease in collagen synthesis, microangiopathy, and neuropathy are a few potential pathways that may be connected to oral problems of diabetes. 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 tendency to infections, and poor wound healing are oral manifestations and complications associated with DM.



## Xerostomia



Diabetes causes salivary dysfunction, which can result in altered saliva composition and reduced saliva flow. Xerostomia can cause a variety of issues, including trouble speaking, swallowing, and eating. In actuality, it can lower people's quality of life. Numerous studies have found that people who have diabetes have reduced salivary function. Although the cause is uncertain, it could be connected to polyuria, autonomic neuropathies, microvascular abnormalities, and changes in the salivary glands' basement membranes. Salivary glucose levels and the severity of xerostomia are significantly correlated. Notably, individuals with poor glycemic control show the greatest level of salivary dysfunction.



## Dental Carries

Diabetes increases the risk of developing both new and recurring dental caries. Tooth decay may become more common due to decreased salivary cleansing and buffering abilities, increasing carbohydrate content, and levels of oral yeasts, mutans streptococci, and lactobacilli. Chronic hyperglycemia can also result in pulp necrosis by causing irreversible pulpitis. According to several research, people with diabetes had a higher prevalence of apical periodontitis and radiolucent periapical lesions than people without diabetes.



## Periodontal Disease (Gum infection)



Evidence suggests that periodontal changes are the first clinical manifestation of diabetes. Gingivitis, periodontitis, and alveolar bone loss can all develop and advance at different rates depending on how well the blood glucose is controlled. People with type 1 and type 2 diabetes have been shown to have a higher incidence and prevalence of the periodontal disease. Alterations in the host defense system (such as neutrophil dysfunction), subgingival microbiota, collagen structure and metabolism, vascularity, gingival crevicular fluid, and inheritance patterns are a few potential explanations for the increased vulnerability to periodontal illnesses.

Furthermore, it has been noted that a number of risk factors, such as poor dental hygiene, poor metabolic management, prolonged diabetes, and smoking, increase these individuals' susceptibility to developing periodontal disease. It is interesting that multiple studies have demonstrated a link between periodontal disease and diabetes, and that managing periodontal disease improves blood glucose management. Treatment for infections results in a reduction in inflammation, which then lowers insulin resistance, which lowers glucose levels. Therefore, there is a reciprocal association between diabetes and periodontal disease. The primary cause of adult tooth mobility and subsequent tooth loss is periodontal disease. Consequently, treating periodontitis can stop tooth loss in addition to lowering blood glucose levels.

## Oral Infections

Diabetes increases a person's risk of developing a variety of oral infections, including bacterial and fungal infections. These infections can be brought on by a decreased salivary flow rate and the lack of antibacterial properties. Infection development may also be significantly influenced by a compromised immune system and ineffective metabolic regulation. A fungal infection that is seen commonly is oral candidiasis. Numerous risk factors, including xerostomia, can lead to the development of oral candidiasis. In



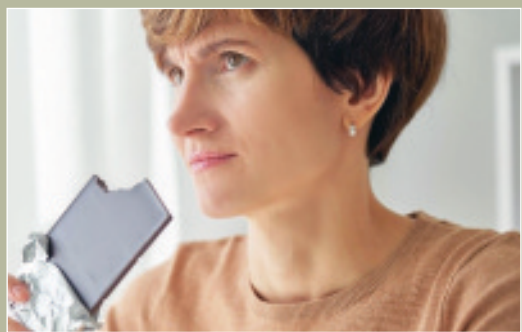
these individuals, salivary dysfunction may be a factor in the increased fungus carriage. Denture stomatitis, angular cheilitis, and median rhomboid glossitis are examples of lesions caused by candida. People with diabetes who smoke, wear dentures, have poor glycemic control, use steroids, and take broad-spectrum antibiotics are more likely to have a candida infection.

### Burning Mouth

Diabetes-related oral burning or dysesthesia is linked to poor glycemic control, metabolic changes in the oral mucosa, angiopathy, candida infection, and neuropathy. Symptoms include neuropathic pain such as burning, tingling, electric shocks, or stabbing sensations, all of which can be quite distressing. These pain sensations have a significant impact on both physical and psychological processes, and they are linked to varying degrees of insomnia, anxiety, and depressive symptoms.



### Taste Dysfunction



People who have poorly controlled diabetes may experience taste impairment. People with diabetes and pre-diabetes were found in a cross-sectional study to have a sweet taste abnormality in 5.7% of cases and a salt taste issue in 8.6% of cases. Raised detection thresholds or altered taste perception can result from salivary malfunction as well as neuropathy.

### Oral Mucosa Alteration

Diabetes may be linked to some oral mucosa changes such as coated and fissured tongue, geographic tongue, recurrent aphthous stomatitis, and various premalignant diseases like oral lichen planus (OLP). Type 1 diabetes is regarded as an autoimmune disease, and OLP has an underlying autoimmune mechanism, hence people with type 1 diabetes experience OLP more commonly than people with type 2 diabetes.





## Poor Oral Wound Healing

One well-known concern with oral surgery in people with diabetes is the slow healing of soft and hard tissues. According to some research, the delayed wound healing may be due to variables like delayed vascularization, reduced blood flow and hypoxia, a loss in innate immunity, a reduction in the generation of growth factors, and psychological stress.

By raising people's awareness of diabetes and its relationship to oral health, it is possible to prevent oral complications and enhance the quality of life. People with diabetes should be encouraged to practice good oral hygiene, go for timely routine oral checkups and manage the condition by maintaining healthy blood glucose levels to avoid oral problems. Dentists should be a part of an interdisciplinary team of healthcare professionals for diabetes management.



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## Frequently Asked Questions

1. I am a 45-year-old female, diagnosed with type 2 diabetes for the past 15 years. My HbA1c levels have constantly been on the higher side. Recently I have noticed that my oral health has been deteriorating. My gums have started getting inflamed and sometimes bleed while brushing. Kindly let me know ways in which I can maintain good oral health.

**Ans.** It is important for everyone to maintain good oral health, but those with high blood glucose may find it more challenging to do so. Gum disease also known as periodontitis is common in people with uncontrolled blood glucose levels. One way to reduce the occurrence is to keep the blood glucose levels in the target range. Of course, oral hygiene needs to be maintained too. A few simple ways through which you can maintain good oral health are: At least twice daily, use fluoride toothpaste to brush your teeth. Regularly floss your teeth. If you have diabetes, let your dentist know. Consult your dentist if your gums are swollen, red, or prone to bleeding. These could indicate gum disease. Dry mouth, loose teeth, or oral pain are other symptoms. If you are prone to gum disease make sure you visit your dentist regularly for dental check-ups and follow-ups. It is important to get treated as oral infections can further lead to high blood glucose levels.



2. I am a 67-year-old diagnosed with diabetes 17 years ago. I was experiencing very sharp pain in the left side of my jaw for the past few months. I visited my dentist, and I underwent a tooth extraction. Can I get a tooth implant, even if I have diabetes?



**Ans.** Numerous studies have demonstrated that individuals with diabetes can be suitable candidates for dental implants; however, as dental implants necessitate minor surgery, there are some safety concerns to be considered before it is done. People with diabetes usually have slow-healing wounds and are more prone to infections. Research has also shown that it takes longer for the bone to heal following dental implantation in people with diabetes and poor glucose control. Your dentist will consider these factors while planning the implant surgery and advise accordingly.

3. I am a 37-year-old man with type 2 diabetes. I am a chain smoker and my HbA1c is 8%. Recently I have noticed that my gums are swollen, and they bleed easily. Is this related to my smoking or diabetes? Is it of great concern?

**Ans.** The association between diabetes and oral health problems is high blood glucose levels. Since your diabetes is not in good control, firstly aim at getting the blood glucose levels in the target range and bringing down the HbA1c to 7% or lesser. People with diabetes who smoke, have 20 times higher risk to develop thrush and periodontal disease (gum disease) as compared to non-smokers. Smoking also hampers blood flow to the gums, which might delay wound healing in this tissue area. Therefore, it is important to take steps towards quitting smoking as both diabetes and smoking are increasing your risk towards poor oral health and oral infections.





4. I am a 25-year-old individual with type 2 diabetes. I have a liking towards chewing-gums. But since I have been diagnosed I was advised to stop using them. Is there any other alternative that I can use?

**Ans.** Yes, sugarless chewing gums are available and can be used. For individuals with diabetes, chewing sugarless gum is beneficial since it increases salivation. Increased saliva flow delivers calcium, phosphate, and fluoride that can help re-mineralize the dental enamel. Saliva prevents tooth decay and gum illnesses by neutralising acids produced by plaque bacteria and acting as a natural mouthwash by dissolving the volatile sulphur compounds. Also, proteins from saliva help to create an acquired enamel pellicle on dental surfaces, which prevents dental erosion.



# Diabetes and Risk of Oral Cancer



**Dr. Prem Narayanan**

**MBBS, MD (Med), DM (Endocrinology)**  
Consultant and Head of Dept, Ahalia Diabetes  
Hospital, Palakkad

**Cancer** is the leading cause of death worldwide, accounting for nearly one in six deaths or 10 million deaths in 2020, according to WHO. Oral cancer, a subtype of head and neck cancer is any cancerous tissue growth located in the oral cavity like the lip, tongue, gums, floor of the mouth, tonsils, other parts of the mouth, and the oropharynx and combined

rank as the 13<sup>th</sup> most common cancer worldwide; more likely to develop in males than in females.

**Oral cancer** is one of the most prevalent cancers to occur in the Indian population, largely attributed to the use of tobacco (chewing/smoking forms). Tobacco use, alcohol consumption, and infection with the carcinogenic human papillomavirus (HPV) are estimated as risk factors for head and neck cancer (HNC), of which cancer-causing infections, such as HPV and hepatitis, are responsible for around 30% of cancer cases in developing nations like India. Additionally, a growing body of research indicates that abnormalities in glucose metabolism and diabetes may also contribute to HNC.

**Oral cancer and diabetes** form part of the top four non-communicable diseases (NCDs) responsible for mortality and morbidity among the Indian population. In recent years, there has been an increase in the number of studies looking into the role of diabetes in oral cancer and discussing the co-existence of diabetes and cancer.

## Common Risk Factors for Diabetes and Oral Cancer

A rapid shift in income, lifestyle, and nutrition has contributed to the spike in the number of NCDs such as diabetes and cancer. Shared risk factors set up the case for an association between cancer and diabetes. Non-modifiable risk factors for both conditions include age, gender, ethnicity and genetic makeup, while modifiable risk factors include a sedentary lifestyle, excess alcohol consumption, tobacco use and an unhealthy diet.

### COMMON RISK FACTORS FOR DIABETES AND ORAL CANCER

#### NON-MODIFIABLE RISK FACTORS

- Ageing
- Gender
- Genetic factors
- Ethnic differences

#### MODIFIABLE RISK FACTORS

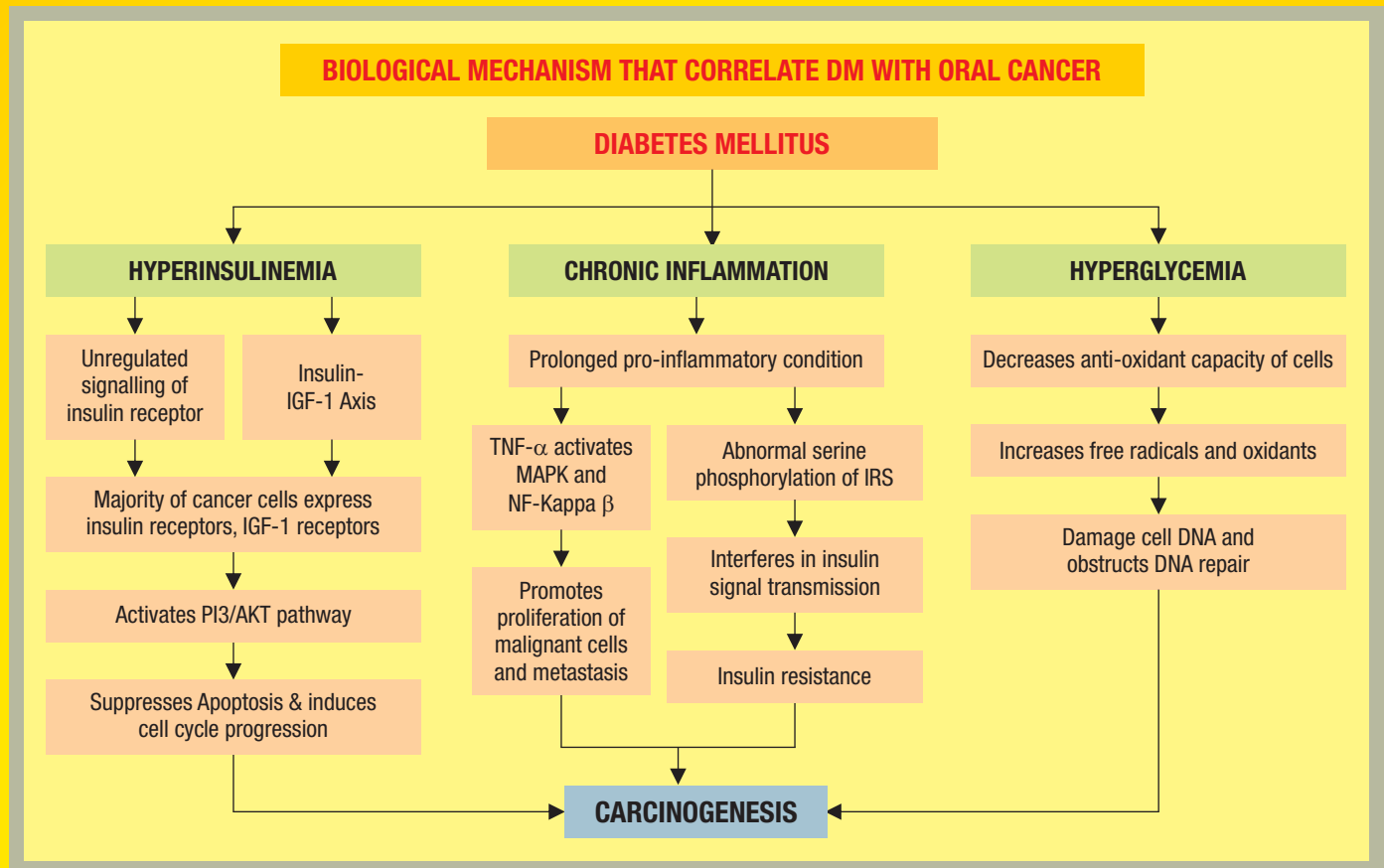
- Dietary factors
- Tobacco use
- Alcohol intake

#### OTHER RISK FACTORS

- Infection
- Socio-economic factors

## Association Between DM and Oral Cancer

Cancer and diabetes (DM) may co-occur due to common risk factors. The biological mechanism linking Type 2 DM and Oral Cancer may be contributed to - hyperinsulinemia, hyperglycemia, and chronic inflammation.



According to one observational study, non-obese people with hyperinsulinemia had a higher risk of death resulting from cancer than people without the condition. While Sen *et al.* in their clinical study, concluded that the risk of oral cancer increased two-fold in patients with **hyperglycemia**.

Evidence supporting the involvement of **inflammatory mediators** in the development of cancer and DM is increasing. DM with poor control has the potential to become chronically inflammatory. These inflammatory indicators can be seen in patients' saliva. Studies have shown that people with oral cancer have higher levels of TNF- $\alpha$ , IL-6, IL-1 $\beta$ , IL-8, and C-reactive proteins in their saliva. Although cancer and diabetes may co-occur due to common risk factors, the biological link between the two disorders still remains unclear.

A retrospective cohort study conducted in Taiwan using the National Health Insurance Program Database concluded that individuals with diabetes are at high risk for oral cancer.



According to an Indian population-based study conducted in 2020, the diabetes drug metformin suppresses AKT activation, which is an early event that plays a critical role in triggering tobacco-induced oral carcinogenesis. This was the first study of its kind to evaluate the impact of habits in relation to DM and metformin in the origin of mouth cancer while also linking the relationship of DM and oral cancer with metformin.

A former 10-year (2002-2011) retrospective study analyzed data from the Cancer Registry Database of Taipei Veterans General Hospital that comprised 191 patients with oral squamous cell carcinoma (OSCC) and reported that patients with diabetes revealed lower 5-year overall survival rates.

A research published in *Diabetologia* revealed diabetes as a risk factor for all-site cancer in both males and females, with a stronger effect in women than men. Women with diabetes had a 13% increased risk of developing oral cancer. The study also reported that diabetes raised the risk of cancer development in both men and women by 19% and 27% respectively.

While many studies showed that diabetes is a risk factor for oral cancer, some studies contradict these findings. Tseng *et al.* (2013) used data from Taiwan's National Health Insurance database to examine the connection between diabetes and cancer and came to the conclusion that diabetes is not a cause of cancer. Similarly, Lai *et al.* observed that diabetes was not a factor for oral cancer in the prospective cohort of the National Institute of Health American Association of Retired Persons Diet and Health Study.

To conclude, available data reveals diabetes and oral cancer as rapidly emerging public health issues, but the magnitude of the problem associated with their coexistence is not known. It is still unclear based on the data in hand whether diabetes causes mouth cancer or vice versa. There is a connection between the two disorders, according to some studies, but the underlying mechanisms are complicated and need further research for detailed understanding.

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## Did You Know?

### A yellow-coated tongue is associated with type 2 diabetes?

Typically, a yellow tongue is a harmless condition that results in a thick, yellowish coating on the tongue. The yellow tongue tends to occur when dead skin cells, bacteria, or discoloring particles become trapped or build up on the tongue's surface. With simple home remedies, the yellow tongue usually gets clear. However, in rare cases, the condition is a sign of a more severe health issue that needs medical attention, typically one like diabetes mellitus. The texture and shape of the tongue can also be impacted by other medical conditions. The possible causes of yellow tongue in people with type 2 diabetes are periodontal disease, fungal infections, and xerostomia which promotes bacterial buildup in the oral cavity. It has been seen that medication for lowering hyperglycemia helps in changing the yellow-coated tongue to normal.



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## Facts and Figures

A study in 2017 by Kejriwal S. *et al.*, was done to assess the knowledge and attitude of people with diabetes (PWD) on oral health, their practice in oral hygiene, and the sources of information about their oral health in Mangalore, India. This study reported that:

- 1) Only 50% of PWD have knowledge about increased risk for oral diseases while 81% have knowledge about systemic complications like retinopathy, cardiac diseases, neuropathy, and nephropathy.
- 2) When it comes to their oral hygiene practices, 62% of the PWD brushed their teeth twice daily while only 24% of the PWD used other means to maintain their oral hygiene.
- 3) 57% of PWD preferred to visit a dentist for oral problems, while 41% still visited a general physician for the same.
- 4) Only 18% of PWD were referred to a dentist by their diabetologist for an oral check-up.



### Resources:

- Kejriwal S, Thomas B, Bhandary R. Assessment of Knowledge and Attitude of Diabetes Mellitus Type 2 Patients about Their Oral Health in Mangalore, India. *Universal Research Journal of Dentistry*. 2014, 4(1)



# What's Trending? Oral Health Status and Diabetes Mellitus in Patients with Cardiovascular Diseases



**Dr. M. Surendra Nehru**

**MBBS, MD (Internal Medicine)**

Senior Consultant, Dept. of Medicine, Mata Chanan Devi Hospital, New Delhi

Cardiovascular diseases (CVDs), which are a leading cause of death worldwide, are also the main cause of a lower quality of life. According to the Global Burden of Disease Study, CVD was responsible for the greatest proportion of non-communicable disease-related fatalities in 2017. About 32.2% of all CVD cases were linked to

diabetes mellitus (DM). One of the most dangerous circumstances that significantly increases cardiovascular symptoms and mortality is the coexistence of DM and ischemic heart disease.

Over the course of adulthood, oral health issues including loss of teeth, periodontitis, and dry mouth accrue and get worse as people age. Elevated levels of inflammation, a poor diet, and illnesses including diabetes, disability, and an increased risk of pneumonia and CVD are all linked to poor dental health. In particular, the occurrence of oral disorders including periodontal disease and dental caries or their progression is highly correlated with CVD and DM.



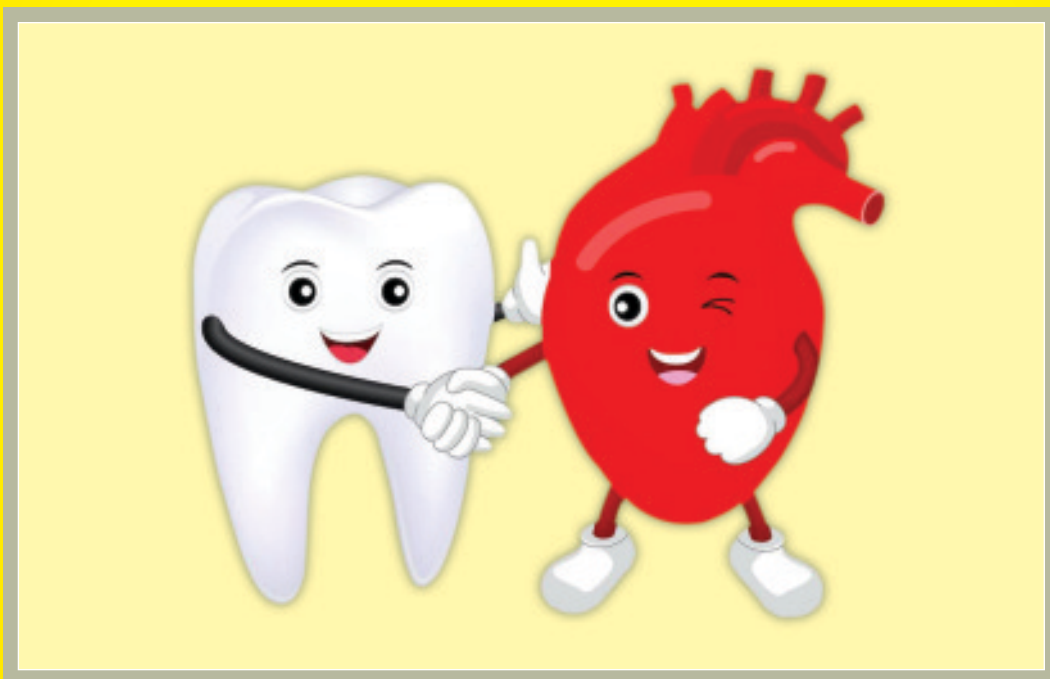
A bacterial biofilm known as dental plaque is what causes periodontitis, a chronic inflammatory condition that affects the bone and periodontal ligaments that surround teeth. The presence of a link between periodontitis and overall health has been established by a number of lines of research during the last few decades. For instance, due to the fact that diabetes and CVD share a chronic inflammatory mechanism of action, investigations have revealed a reciprocal relationship among periodontal health and all these illnesses. For instance, those who have diabetes seem to be more likely to contract infections and develop periodontitis than those who do not have this syndrome. Similarly, it is now known that periodontitis exacerbates cardiac problems also. Due to all of these factors, it is extremely likely that controlling periodontitis affects the development or progression of diabetes and CVD. Furthermore, there may be a bidirectional relationship because chronic inflammatory periodontal illnesses like periodontitis are known as risk factor for DM and CVD. In actuality, the chronic inflammatory paradigm of DM and CVD serves as the foundation for periodontitis. Different tissues and organs of the cardiovascular system have shown endocarditis, myocarditis, pericarditis, and atherosclerotic lesions, indicating the presence of periodontal pathogenic microorganisms. Bacteria from the mouth, in particular, can circulate to other regions of the body and cause chronic oral inflammation. This could affect the severity or onset of chronic disorders. Additionally, oral health difficulties in patients with diabetes are highly related to knowledge, attitudes, and awareness of oral health. As a result, oral health issues should be closely evaluated in conjunction with both DM and CVD. Numerous researches have revealed correlations between DM or CVD & dental health, much like the link between DM and dental health or the link between CVD & oral health. Aggressive periodontitis was actually listed as the sixth main DM consequence after the five major ones, which are cardiovascular, peripheral vascular disease retinopathy, neuropathy, and retinopathy. People with DM may be more likely to develop incident periodontitis among those with CVD than those without DM. Additionally, connections between oral health issues accumulating and dry mouth and all-cause mortality have been noted. Older populations frequently report feeling their mouths are

dry. It is commonly a consequence of pharmaceutical use for chronic conditions such as DM, chronic inflammatory autoimmune conditions, and neurologic disorders, and can be related to a higher risk of hypertension. Stroke, atherosclerosis, and thrombus development could all be caused by periodontal disease. The oral microflora is thought to be the source of the majority of bacteria detected in atherosclerotic plaques.

Systemic inflammatory or immunological responses may result in periodontal disease and tooth caries in people with persistently uncontrolled hyperglycemia, increasing the risk of cardiovascular disease. Patients with DM who have CVD may have poor dental health. Studies report a higher prevalence of oral health problems such as periodontitis and less than 20 remaining teeth among CVD patients with DM. It is recommended that healthcare professionals should provide accessible dental care services to CVD patients with DM and develop strategies to improve their oral health.

### Resources:

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# Role of a Dentist in Diagnosis and Awareness of Diabetes



**Dr. Aushili Mahule**

**BDS, MDS, PGDCR**

Medical Advisor, USV Pvt Ltd, Mumbai

It is said that,

***“Every tooth in a man’s head is more valuable than a diamond.”***

Diabetes is a chronic metabolic disorder causing hyperglycemia which leads to long-term damage to different organs including the heart, eyes, kidneys,

nerves, and vascular system including the stomatognathic system. It has been affecting human life for thousands of years. There are currently 537 million people of working age (20–64 years) with diagnosed or undiagnosed diabetes in 2021. As for those diagnosed with diabetes, most are aware of the complications, such as macro-vascular (cardiovascular, cerebrovascular, and peripheral) and micro-vascular (retinopathy, nephropathy, and neuropathy) diseases.

The relationship between diabetes and oral health is bidirectional. Dentists are important members of the healthcare team, and play a major role in providing oral care to people with diabetes. T2DM risk assessment appears to be a natural extension of their current duties, especially given their own strong support for such an intervention.

They can reduce the morbidity and mortality associated with diabetes by looking over the person’s medical background, taking their vitals, and checking for oral indications of poorly controlled diabetes. And, then refer patients with the signs and symptoms of oral complications suggestive of diabetes to physicians for further evaluation.

Uncontrolled diabetes can have several oral symptoms, such as xerostomia (dry mouth), a burning feeling in the mouth, poor or delayed wound healing, an increased prevalence and severity of infections, enlargement of the parotid salivary glands, gingivitis, and/or periodontitis.

According to a meta-analysis study, it was observed that almost 73-87% of the patients agreed that a dentist can also identify people with a high risk of developing diabetes. And most of the patients were also willing to undergo screening methods and discuss the same with their dentist.

A simple three-step method through which dentists can help diagnose and spread awareness is to follow the “3A’s”

**Ask:** Ask the people with diabetes (PWD) if they’re aware of the connection between diabetes and oral health, and its complications and educate them about the same.

**Assess:** Screen all the patients, especially the ones already showing oral symptoms of diabetes.

**Act:** Treatment, counseling, and referral to an endocrinologist should be provided as necessary for the patients.



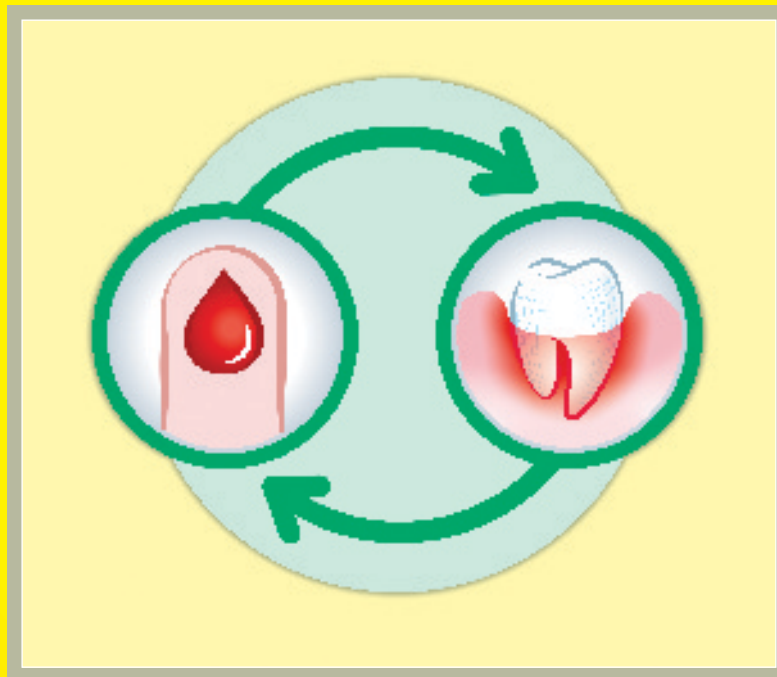


However, a few barriers to this are an individual's perception of dental teams, poor rate of follow-up with primary care medical practitioners for appropriate diagnosis and management, time and cost, adequate training, support of the dentist or dental practice owner, and patient willingness.

A dentist plays a significant role in helping PWD to diagnose their condition, assisting PWD to maintain glycemic control by effectively treating oral infections, and advising them about maintaining oral hygiene.

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# The Significance of Diet in Maintaining Oral Health in Diabetes



## Dr. Abhishek Arun

MBBS, MD, M Med, MRCP, FRCP, MAMS,  
Phd, Fellowship in diabetes  
Consulting Diabetologist & Metabolic  
Physician, Vishudh Diabetes Clinic, Lucknow

Diabetes if uncontrolled, affects various parts of the body. One such complication of diabetes that is not given enough attention is oral health. Diabetes affects oral health and increases the risk of periodontal disease, oral candidiasis, dental caries, xerostomia, and impaired taste function. Similar to other complications, optimal blood glucose control

will help in the prevention and management of these oral complications. Proper oral hygiene and regular dental check-ups are important, but at the same time, it is important to know the significant role of a healthy diet in maintaining good oral health.

## Periodontal Disease (PD)

Refers to inflammation of the mouth that involves the gingiva (gum tissues), teeth, and supporting bone. If left untreated, the involved teeth will exfoliate. Patients with poorly controlled diabetes are at greater risk for PD progression than those with well-controlled diabetes. The former present with severely inflamed gums and evidence of loss of tooth support. PD has a complex infectious etiology. The immune response to this infection in diabetes is impaired due to immune dysfunction secondary to uncontrolled blood glucose levels. Thus, dental treatment and a well-balanced healthy diet will help in both glycemic control and the management of the periodontal disease.

**Antioxidants:** Oral tissue oxidation contributes to the progression of gingivitis and periodontitis. Hence, nutrients with antioxidant potential will play an important role in the management of the periodontal disease. Following nutrients play a significant role-

**Vit. C** is known as a powerful antioxidant. Low Vit. C intake has been shown to increase periodontal disease risk. Citrus fruits such as amla, orange, lemon, grapes, strawberries, other fruits like guava, papaya, and fresh vegetables like bell peppers, broccoli, cabbage, and tomato are rich sources of Vit. C. While taking supplements, it is important to select capsule form rather than a chewable form of Vit. C, as the acidity and oral retention of the chewable form may increase the risk for dental caries.

**Vit. E** is another antioxidant vitamin that is fat-soluble and protects the cell membranes from oxidative damage. Vit. E sources include sunflower seeds, almonds, canola oil, wheat germ, whole grain cereals, etc.

**Vit. A** and carotenoids promote oral health via their roles in collagen formation, as antioxidants, and epithelial cell production lining the oral cavity. Sources include egg yolk, milk & products, orange, yellow, and dark green vegetables, and fruits. Carrots, squash, pumpkin, spinach, sweet potato, mango, and peaches contain  $\beta$ -carotene, the precursor of Vit. A.

## Cavities

Cavities are formed as a result of bacteria, plaque, an acidic oral environment, and the presence of carbohydrates in the mouth. Proper dental care helps to control bacteria and plaque, but the acidity and the amount of carbohydrates in the mouth are influenced by an individual's diet. A cavity-causing environment is when the pH is less than 5.5. Fruit juices, soda, diet soda, chewable Vit. C

tablets, and sports drinks create a cavity-friendly level of acidity. Individuals with diabetes limit their consumption of drinks with added sugar, but they should also limit the consumption of artificially sweetened sodas. It is also important to know that the amount, type, duration, and frequency of carbohydrate intake all affect cavity development. Choosing the right types of carbohydrates will reduce cavity risk while still controlling blood glucose levels.



Consumption of high quantities of simple sugars like table sugar causes a highly cariogenic environment and thus, should be minimized. Foods high in starch such as rice, potato, pasta, and bread are not cariogenic except when consumed with added sugars. On the other hand, fiber helps to reduce the incidence of cavities. Choosing high-fiber carbohydrates has been an ancient recommendation for people with diabetes, and having fewer cavities is another important reason to do so. Some people with diabetes who have frequent hypoglycemic episodes may repeatedly correct by sucking on hard candies. This frequent and prolonged exposure to simple sugars may increase the risk for cavities. Here, it is wise to make use of glucose tablets/beverages to correct hypoglycemia, as they clear from the mouth more swiftly than hard candies.

**Anti-cariogenic nutrients:** Eating protein with meals is anti-cariogenic as it functions as a pH buffer, preventing acidic conditions in the mouth. Choosing proteins that are low in fat and cholesterol is advised for people with diabetes. Fiber does not produce cavities as it is not metabolized by oral bacteria. Also, fibrous foods require more mastication than non-fibrous foods, which stimulates saliva secretion. Low salivary flow is said to be linked with increased dental cavities. Emphasis on both protein and fiber has already been used as a strategy for blood glucose management. Another source of anti-cariogenic nutrients is dairy products. These nutrients include casein, calcium, and phosphorous; in addition, milk sugar i.e. lactose is said to be the only simple sugar that is not cariogenic. Fortunately, low-fat and non-fat dairy products have the same anti-cariogenic nutrients minus the harmful fat and cholesterol found in full-fat products. Dark-green vegetables are good plant sources of anti-cariogenic calcium, and they also provide  $\beta$ -carotene and fiber. Two foods emerging as strongly anti-cariogenic foods are xylitol and tea. Xylitol is a sugar alcohol, found in certain sugarless gums. It has a minimal effect on blood glucose levels and chewing after meals and snacks helps clear the mouth of cariogenic foods, and stimulates saliva flow. At the very least, to help prevent cavities, rinse your mouth post meals with the most vital nutrient “water.”

For other conditions like xerostomia, there are also simple ways to keep the mouth moist. The most obvious solution to dry mouth is hydration, frequently sipping plain water, avoid caffeinated and alcoholic beverages, because they exacerbate dehydration and dryness. Pay close attention to the temperature of foods and beverages as hot foods and beverages can be very drying or may burn the mouth. People with diabetes are advised to take small bites and chew food thoroughly to help stimulate saliva flow. Chewing gums with xylitol may be useful for people with Xerostomia. In conclusion, the intake of protein, fiber, a variety of fruits & vegetables, adequate hydration, and reduced simple sugar intake should be emphasized. As evident, nutrition for oral health is no different from a general healthy eating regimen for people with diabetes. *Lastly, routine dental care combined with optimal nutrition will keep one smiling and ensure stress-free oral health.*

### Resources:

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In T2DM Uncontrolled on DPP4i+Metformin or SGLT2i+Metformin,

Switch Early to

# UDAPA-Trio

Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 500 mg XR

# UDAPA-Trio Forte

Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 1000 mg XR



**C**ardio Benefits

**A**1C Control

**R**enal Benefits

**E**nsures Adherence

#### Abridged Prescribing Information

**Indication:** It is indicated as an adjunct to diet and exercise to improve glycaemic control in adults with type 2 diabetes mellitus.

**Dosage and Administration:** The recommended dose is one tablet daily. Each tablet contains a fixed dose of dapagliflozin, Sitagliptin and Metformin Hydrochloride.

**Adverse Reactions:** Most common adverse reactions reported are: Dapagliflozin- Female genital mycotic infections, nasopharyngitis, and urinary tract infections. Sitagliptin- Upper respiratory tract infection, nasopharyngitis and headache. Metformin- Diarrhea, nausea/vomiting, flatulence, asthenia, indigestion, abdominal discomfort, and headache.

**Warnings and Precautions:** Dapagliflozin: Volume depletion; Ketoacidosis in Patients with Diabetes Mellitus; Urinogen and Pyelonephritis; Hypoglycaemia; Genital Mycotic Infections

Sitagliptin: General- Sitagliptin should not be used in patients with type 1 diabetes or for the treatment of diabetic ketoacidosis. Acute pancreatitis: Hypoglycaemia when used in combination with other anti-hyperglycaemic medicinal product; Renal impairment; Hypersensitivity reactions including anaphylaxis, angioedema, and exfoliative skin conditions- Stevens-Johnson syndrome; Bullous pemphigoid. Metformin Hydrochloride: Lactic acidosis; In case of dehydration (severe diarrhoea or vomiting, fever or reduced fluid intake), metformin should be temporarily discontinued and contact with a healthcare professional is recommended.

**Contraindications:** Hypersensitivity to the active substance of Dapagliflozin, Sitagliptin & Metformin or to any of the excipients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis); Diabetic pre-coma; Severe renal failure ( $eGFR < 30 \text{ mL/min}$ ); Acute conditions with the potential to alter renal function such as: Dehydration, Severe Infection, Shock; Acute or chronic disease which may cause tissue hypoxia such as: Cardiac or respiratory failure, Recent myocardial infarction, Shock, Hepatic impairment, Acute Alcohol intoxication, alcoholism

**Use in a special population:** Pregnant Women: Due to lack of human data, drug should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Paediatric Patients: The safety and efficacy of drug has not yet been established. No data are available. Geriatric Patients: In Patients  $> 65$  years, it should be used with caution as age increases.

Additional information is available on request.

Last updated: January 03, 2023





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# Glycomet<sup>®</sup>-GP 1/2/3/4 FORTE

Metformin Hydrochloride 1000 mg SR + Glimepiride 1/2/3/4 mg

Therapeutic Advances  
in Endocrinology  
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## Meta-Analysis of 21 well established Trials

In Patients with high BMI



BMI Reduced by  
1.01 units

5% Weight loss vs  
Baseline body weight



High Dose Metformin improves  
Insulin sensitivity Vs Other OADs



# FORte EVER

**Source:** 1. JAPI 2020;68:51-55 2. Data on File, 3. Cureus 2020; 12(9): e10.7759/cureus.1070 4. Diabetes Technology & Therapeutics 2019; 21:79-84 5. Kaino, et al.: Sulfonylurea and combinations: International Task Force Indian J Endocr Metab 2018;22:132-57.

### Prescribing Information

**Information:** Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycomet-GP 0.5/Glycomet-GP 0.5 Forte/ Glycomet-GP 1/ Glycomet-GP 1/050/ Glycomet-GP 2/ Glycomet-GP 2/050/ Glycomet-GP 3/ Glycomet-GP 3/050/ Glycomet-GP 4/ Glycomet-GP 4/050/ Glycomet-GP 1 Forte/ Glycomet-GP 2 Forte/ Glycomet-GP 3 Forte/ Glycomet-GP 4 Forte Abridged Prescribing Information. **Composition:** Glycomet-GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg. Glycomet-GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg. Glycomet-GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. Glycomet-GP 1/050: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 1 mg. Glycomet-GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. Glycomet-GP 2/050: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 2 mg. Glycomet-GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. Glycomet-GP 3/050: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 3 mg. Glycomet-GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. Glycomet-GP 4/050: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 4 mg. Glycomet-GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. Glycomet-GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. Glycomet-GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. Glycomet-GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 4mg. **Indications:** Glycomet-GP is indicated for the management of patients with type 2 diabetes mellitus (T2DM) when diet, exercise and single agent (metformin hydrochloride or glimepiride alone) do not result in adequate glycaemic control. **Dosage and Administration:** Dosage of Glycomet-GP should be individualized on the basis of effectiveness and tolerability while not exceeding the maximum recommended daily dose of glimepiride 4mg and metformin 2000 mg. **Initial dose:** 1 tablet of Glycomet-GP should be administered once daily during breakfast or with the first main meal. Do not crush or chew the tablet. In several cases the tablet may remain intact during transit through the gastrointestinal (GI) tract and will be eliminated in faeces as hydrated mass (ghost matrix). Patients should be advised that this is normal as all drug components have already been released during GI transit. **Contraindications:** In patients hypersensitive to glimepiride, other sulfonylureas, other sulfinamides, metformin or any of the excipients of Glycomet-GP; pregnancy and lactation; diabetic ketoacidosis, diabetic pre-coma, in patients with eGFR <30 ml/min/1.73 m<sup>2</sup>, acute conditions with the potential to alter renal function (dehydration, severe infection, shock, intravascular administration of iodinated contrast agents), acute or chronic disease which may cause tissue hypoxia (myocardial infarction, shock, cardiac/respiratory failure) hepatic insufficiency, acute alcohol intoxication, alcoholism. **Warnings:** Keep out of reach of children. Patient should be advised to report promptly exceptional stress situations (e.g. trauma, surgery, febrile infections). Blood glucose regulation may deteriorate and a temporary change to insulin may be necessary to maintain good metabolic control. In case of lactic acidosis, patient should be hospitalized immediately. **Precautions:** In the initial weeks of treatment, the risk of hypoglycaemia may be increased and necessitates especially careful monitoring. Serum creatinine levels should be determined before initiating treatment and regularly thereafter; at least annually in patients with normal renal function. Intravascular contrast studies with iodinated materials can lead to acute alteration of renal function. In patients in whom such study is planned, Glycomet-GP should be temporarily discontinued at the time of or prior to the procedure, and withheld for 48 hours subsequent to the procedure and reintroduced only after renal function has been re-evaluated and found to be normal. Use of Glycomet-GP should be discontinued 48 hours before any surgical procedure. **Adverse reactions:** For glimepiride - hypoglycaemia; temporary visual impairment; GI symptoms like nausea, vomiting, abdominal pain, diarrhoea may occur; increased liver enzymes, cholestasis and jaundice may occur; allergic reactions may occur occasionally. For metformin - GI symptoms like nausea, vomiting, abdominal pain or discomfort may occur.

In case of any adverse events, kindly contact [pr@usa.in](mailto:pr@usa.in)

For the use of registered medical practitioner, hospital or laboratory



Your reliable healthcare partner

# Diabetes Tongue



## Dr. Sucheeth Avanti

MBBS, MD Geriatrics

Consulting Diabetologist, Cardiologist & Intensivist, Ashtvinayak Hospital, Navi Mumbai

People with diabetes are more likely to experience changes in their oral cavity, particularly their tongue, which is frequently ignored. Even though diabetes has a significant association with periodontal and gingival complications, there is a clear association between diabetes and tongue disorders or abnormalities that may result in Candida infection,

atrophic glossitis, atrophic glossitis with Candida infection, oral hairy leukoplakia, geographic tongue, fissured tongue, and taste dysfunction.

## Altered Taste Sensation

Endocrine and metabolic diseases have been suggested as the main etiological factors in altered taste perception or taste dysfunction. In addition, a dysfunction of the salivary glands may indicate a change in taste perception or a rise in detection thresholds. People with uncontrolled diabetes have reported greater cases of taste impairment than people with good glycemic control.



## Glossitis



One of the inflammatory signs of diabetes is glossitis, which has been linked to stomatitis, skin rashes, weight loss, diarrhea, a drop in hemoglobin levels, and a rise in plasma amino acid levels in people with glucagonoma associated with diabetes mellitus.

## Central Atrophic Glossitis

Candidiasis is most likely the cause of central atrophic glossitis or median rhomboid glossitis of the tongue. Long-lasting central papillary atrophy of the tongue is a typical symptom that develops as a result of a risk factor such as microangiopathy, which is a frequent finding in people with diabetes mellitus.





## Candidiasis of Tongue

One-fourth of people with diabetes have the first and most common symptoms of candidiasis in the oral cavity. Candida infections can be worsened by diabetes. Higher candidal colony-forming units and elevated salivary glucose levels can both boost the growth of candida and raise the incidence of candidiasis in diabetes patients. A predisposing factor like diabetes mellitus, which is also linked to the use of broad-spectrum antibiotics and corticosteroid inhalation, accounts for 3/5 of the cases of candidal glossitis, also known as acute atrophic glossitis. Additionally, linked to candidal lesions include denture-induced stomatitis, angular cheilitis, and median rhomboid glossitis, all of which have numerous bacterial and fungal etiologies.



## Oral Hairy Leukoplakia (OHL)



A white lesion called oral hairy leukoplakia (OHL) is brought on by the Epstein-Barr virus (EBV). OHL are tongue-side lesions that are frequently linked to severe immunodeficiency disorders. OHL incidence in diabetes individuals is caused by aberrant macrophage phagocytic activity and insufficient PMN leukocyte chemotaxis.

## Geographic Tongue

Geographic tongue, also known as benign migratory glossitis (BMG), is an inflammatory disorder that only affects the dorsum of the tongue and is asymptomatic. People with diabetes mellitus may have sluggish tissue repair and delayed healing as a result of hypoxia and oral microvascular dysfunction. Clinically, the lesion may manifest as single or multiple lesions. It may also present with non-nucleated patches that are devoid of keratin, giving them a reddish appearance, while the opposite side has thick borders that are white to cream in color. In addition to a greater incidence of the tissue type HLA-B15, which is more common in the population of people with type 1 diabetes, BMG has a genetic predisposition that exhibits polygenetic inheritance.



## Fissured Tongue

Fissured tongue is a developmental or genetic abnormality of the tongue that is characterized by a profusion of furrows or grooves on the dorsal surface. It is typically asymptomatic, except when food or debris build-up in the furrows. It may cause pain or discomfort and increase the risk of infection. It has been reported that people with type 1 diabetes are more likely to have a fissured tongue with a widespread problem linked to a double fissure running longitudinally down the dorsum of the tongue.

Oral complications in people with diabetes can affect their quality of life. Chronic and persistent oral issues adversely affect blood glucose control. Thus, it is important to prevent and diagnose oral complications early to help with timely treatment.



### Resources:

1. Hsu PC, Wu HK, Huang YC, *et al.* The tongue features associated with type 2 diabetes mellitus. *Medicine (Baltimore)*. 2019;98(19):e15567. doi:10.1097/MD.00000000000015567
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## Diabetes Educator Tip of the Month



**Contributed by**  
**Name: Ms. Samrin Khan**

**Masters in Clinical Nutrition and Dietetics,  
Specialized in Diabetes and Cardiac  
Nutrition, Certified Diabetes Educator.**

### Tips to Keep Mouth Healthy and Happy

Controlling blood glucose levels is essential in diabetes to live a healthy and happy life. People with poor glycemic control are at a risk for health complications, oral health being one of them. Poor oral health also increases the risk to develop heart

disease. Diabetes and dental care should be taken seriously to help prevent damage to the teeth and gums. To keep a healthy smile, the following tips should be followed

- **Good glycemic control:** Monitor the blood glucose levels and follow the doctor's recommendations to keep them within the desired range. When the blood glucose levels are well controlled, dental issues are less likely to occur.
- **Brush at least twice a day:** Teeth should be brushed twice a day using fluoride-containing toothpaste and a soft-bristled toothbrush. Avoid rough or forceful cleaning because it can irritate the gums.
- **Floss at least once a day:** Plaque between the teeth and below the gum line increases the risk of developing tooth decay and gum disease. Flossing helps remove this plaque.
- **Schedule regular dental visits:** Visit the dentist at least twice a year for professional cleanings, X-rays, and checkups. Ask the dentist for advice on how to take care of the teeth at home, including what products and cleaning tools to use. Any changes in the health or medications should be disclosed to the dentist since both might have an impact on oral health, such as the development of dry mouth symptoms.
- **Quit smoking:** Smoking increases the risk of gum disease and can worsen diabetes. Discuss with the doctor a smoking cessation program to break the cigarette habit.



### Resources:

1. Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/diabetes/managing/diabetes-oral-health.html>
2. National Institutes of Diabetes and Digestive and Kidney Diseases. Available at: <https://www.niddk.nih.gov/health-information/diabetes/overview/preventing-problems/gum-disease-dental-problems>
3. American Diabetes Association. Available at: <https://diabetes.org/diabetes/keeping-your-mouth-healthy>
4. National Institute of Dental and Craniofacial Research. Available at: <https://www.nidcr.nih.gov/health-info/diabetes>



# Superfood: Red Lentils (Masoor)

Red lentil is commonly known as 'Masoor dal.'

In recent years, there has been a rise in the popularity of lentils as a superfood and as the "poor man's meat."

The seeds come in a range of hues, including yellow, orange, green, red, brown, and black. Regular lentil consumption may reduce the risk of developing lifestyle diseases like diabetes, cardiovascular disease, several degenerative diseases, and even some types of cancer. It is packed with nutrients and germination and fermentation can further enhance its bioavailability of these.



## Nutritional Benefits

- Good source of protein
- Packed with micronutrients like zinc, selenium, iron, folate
- Enhance gut bacteria and improve gut health
- Prebiotic food
- Quick to cook so nutrient losses are less

## Health Benefits

### Cardiovascular and anti-diabetes benefits

Red lentils are low glycemic index (GI) food that helps to regularize lipid profile and can control glycemic responses and improve glycemic control.

- Lentils include anti-nutrients lectin, phytic acid, and tannins that slow down the breakdown of starch and normalize postprandial glycemia.
- Because of the high fiber content, it also interferes with the ileum's ability to reabsorb bile acid and cholesterol. The activity of the insulin-dependent enzyme HMG-co A reductase is decreased by lentils, which also inhibits the absorption of carbohydrates.
- The  $\beta$ -glucan found in lentils can lower total cholesterol in the blood.
- Angiotensin-1 converting enzyme (ACE) inhibitor activity, present in lentils, helps to lower blood pressure.

### Anti-oxidant property

Lentils have the highest total phenolic content among pulses, which is an antioxidant feature. (Phenolic compounds are significant anti-oxidants present in lentils). Red lentils have more phenolic and anti-oxidant content than pale ones.

### Anti-obesity

The low GI and high fiber content of lentils give a feeling of satiety resulting in less caloric consumption and aiding in weight loss.

### Anti-cancer

Lentils are known to be cancer preventive in nature. They are a functional food with chemo-preventative properties due to the presence of a wide variety of bio-actives compounds such as polyphenols and peptides.

## How to Consume?

Red lentils are highly adaptable and can be used in a variety of dishes, including soups, stews, dals, curries, and sprouted lentil salads. They lend a rich texture to any recipe they are added to.

### Resources:

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## Recipe: Red Lentil Soup

Serves: 1

Ingredients	Amount
Split red lentils	3 tbsp
Onions (finely chopped)	1 medium
Carrot peeled and grated	1 no.
Tomato (chopped)	1 cup
Vegetable stock	300 mL
Oil	1 tsp
Chili flakes	1 tsp
Cumin seeds	1 tsp
Coriander leaves	A few
Salt and pepper	To taste
1 cup: 250 mL; 1 tablespoon: 15 mL; 1 teaspoon: 5 mL	



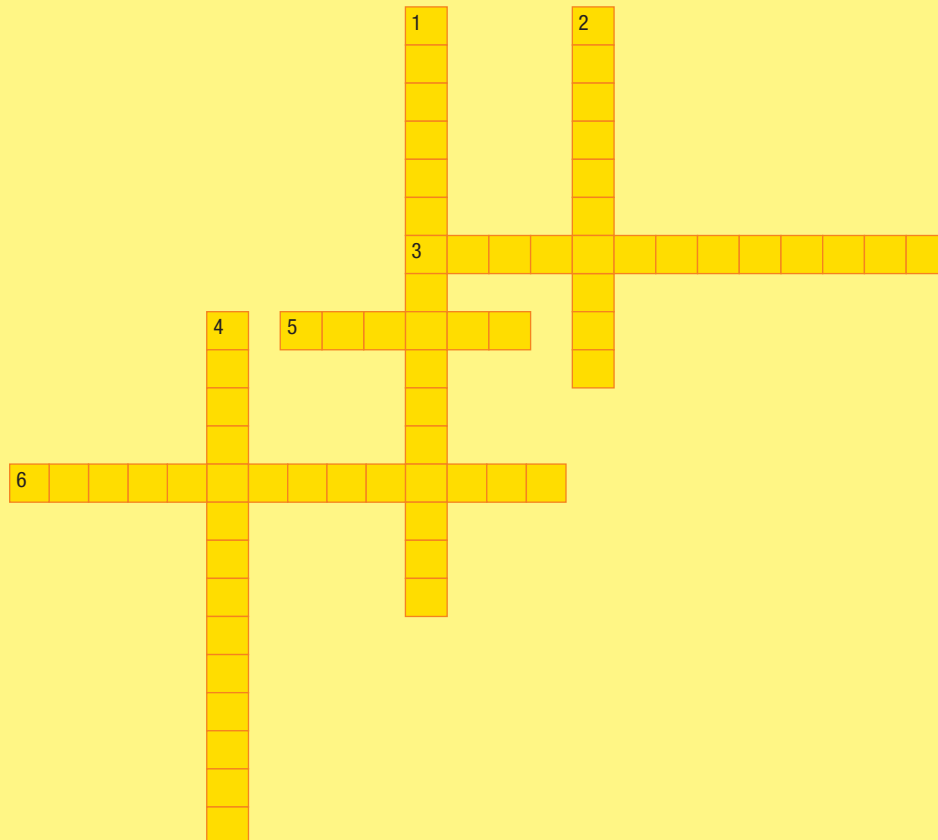
### Method

1. Pressure cook split red lentils for 3-4 whistles.
2. Cook onions and carrots in a pan in little oil till soft.
3. Add chili flakes and cumin seeds, sauté for a minute.
4. Add the cooked lentils, tomato, and vegetable stock.
5. Simmer for 15–20 minutes until the lentils are soft.
6. Add salt and pepper, garnish with coriander leaves, serve hot.



## Crossword

### DIABETES AND ORAL HEALTH



#### Across

3. A serious gum infection that damages gums and can destroy the jawbone
5. Permanently damaged areas in teeth that develop into tiny holes
6. A developmental or genetic abnormality of the tongue that is characterised by a profusion of furrows or grooves on the dorsal surface

#### Down

1. Also known as benign migratory glossitis (BMG), is an inflammatory disorder that only affects the dorsum of the tongue and is asymptomatic
2. Reduced saliva flow or dry mouth
4. High blood glucose levels

**Answers**  
**Across:** 3. Periodontitis, 5. Cavity, 6. Fissured tongue  
**Down:** 1. Geographical tongue, 2. Xerostomia, 4. Hyperglycaemia

## Patient Speaks

I am a 45-year-old man diagnosed with type 2 diabetes 7 years back. I have been taking my medications regularly. However, I did not monitor my blood glucose level often and last saw my doctor a year back. Recently, I happened to visit a diabetes educator (DE) with my friend who had an appointment with his DE for his diabetes management. While she explained to him certain aspects of achieving good glycemic control, I also got interested and took an appointment.

The DE took my detailed history. She started educating me on different aspects of diabetes management. While she was doing that, I just happened to mention to her that I feel I have weak teeth and my gums bleed sometimes while I brush my teeth. On listening to this, she asked me when I visited my dentist last, and I could not even remember. She advised me to see a dentist immediately. She went on to explain that as a person living with diabetes, I had a higher risk of oral infections and gum disease if the blood glucose is not under control. I was not aware of this and honestly never linked this symptom to my diabetes control. I wasn't even aware if my diabetes was in control as I had not tested for a long time. The DE then asked me whether I smoked, and I told her that I have been smoking 2-3 cigarettes daily for the last 15 years. She then explained to me how smoking was also an additional risk factor that was responsible for my poor oral health. She educated me on ways to quit smoking. I was also made aware that poor oral health could lead to heart issues as well if not treated in time. I realized I have been taking these symptoms lightly and decided to follow her advice. I visited my dentist the same day and sure enough, he told me I was beginning to develop periodontitis and started treating me for the same. The dentist also gave me a list of routine things to do to take care of my oral health. As advised by the DE, I also got my blood tests done and realized that my blood glucose levels have been high in spite of regular medications. So I also followed up with my diabetologist and he adjusted my medication dosage. With all these interventions, I was able to get my blood glucose in control, and eventually, even my oral issues were getting better. I was thankful to my friend to introduce me to the DE and of course my DE to educate me on so many things that I never even thought were linked to diabetes. I am now more confident about managing diabetes better.



# Beat Diabetes

*Win Life*

For screening people with High & Moderate Risk of Diabetes

## Indian Diabetes Risk Score



An awareness initiative by







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In T2DM Across Continuum,

Start with

# Glycomet<sup>®</sup>-GP 1/2

Metformin Hydrochloride 500 mg SR + Glimepiride 1/2 mg



**Source:** 1. JAPI 2020 68,51.-55 2. Data on File, 3. Cureus 2020; 12(9): e10.7759/cureus.1070 4. Diabetes Technology & Therapeutics 2019,,2,79-84 5. Kalra, et al.: Sulfonylurea and combinations: International Task Force Indian J Endocr Metab 2018;22:132-57.

## Prescribing information

**Information:** Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycomet-GP 0.5/Glycomet-GP 0.5 Forte/ Glycomet-GP 1/ Glycomet-GP 1/850/ Glycomet-GP 2/ Glycomet-GP 2/850/ Glycomet-GP 3/ Glycomet-GP 3/850/ Glycomet-GP 4/ Glycomet-GP 4/850/ Glycomet-GP 1 Forte/ Glycomet-GP 2 Forte/ Glycomet-GP 3 Forte/ Glycomet-GP 4 Forte Abridged Prescribing Information **Composition:** Glycomet GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg. Glycomet GP 0.5 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg. Glycomet GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. Glycomet GP 1/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 1 mg. Glycomet GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. Glycomet GP 2/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 2 mg. Glycomet GP 3: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 3 mg. Glycomet GP 3/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 3 mg. Glycomet GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. Glycomet GP 4/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 4 mg. Glycomet GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. Glycomet GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. Glycomet GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. Glycomet GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP mg. **Indications:** Glycomet GP is indicated for the management of patients with type 2 diabetes mellitus (T2DM) when diet, exercise and single agent (metformin hydrochloride or glimepiride alone) do not result in adequate glycemic control. **Dosage and Administration:** Dosage of Glycomet GP should be individualized on the basis of effectiveness and tolerability while not exceeding the maximum recommended daily dose of glimepiride 8mg and metformin 2000 mg. **Initial dose:** 1 tablet of Glycomet GP should be administered once daily during breakfast or with the first main meal. Do not crush or chew the tablet. In several cases the tablet may remain intact during transit through the gastrointestinal (GI) tract and will be eliminated in feces as hydrated mass (ghost matrix). Patients should be advised that this is normal as all drug components have already been released during GI transit. **Contraindications:** In patients hypersensitive to glimepiride, other sulfonylureas, other sulfonamides, metformin or any of the excipients of Glycomet GP; pregnancy and lactation; diabetic ketoacidosis, diabetic pre-coma, in patients with eGFR<30 ml/min/ 1.73 m2, acute conditions with the potential to alter renal function (dehydration, severe infection, shock, intravascular administration of iodinated contrast agents), acute or chronic disease which may cause tissue hypoxia (myocardial infarction, shock, cardiac/respiratory failure) hepatic insufficiency, acute alcohol intoxication, alcoholism. **Warnings:** Keep out of reach of children. Patient should be advised to report promptly exceptional stress situations (e.g. trauma, surgery, febrile infections). Blood glucose regulation may deteriorate and a temporary change to insulin may be necessary to maintain good metabolic control. In case of lactic acidosis, patient should be hospitalized immediately. **Precautions:** In the initial weeks of treatment, the risk of hypoglycemia may be increased and necessitates especially careful monitoring. Serum creatinine levels should be determined before initiating treatment and regularly thereafter: at least annually in patients with normal renal function. Intravascular contrast studies with iodinated materials can lead to acute alteration of renal function. In patients in whom such study is planned, Glycomet GP should be temporarily discontinued at the time of or prior to the procedure, and withheld for 48 hours subsequent to the procedure and reinstituted only after renal function has been re-evaluated and found to be normal. Use of Glycomet GP should be discontinued 48 hours before any surgical procedure. **Adverse reactions:** For glimepiride - hypoglycaemia; temporary visual impairment; GI symptoms like nausea, vomiting, abdominal pain, diarrhoea may occur; increased liver enzymes, cholestasis and jaundice may occur; allergic reactions may occur occasionally. For metformin - GI symptoms like nausea, vomiting, abdominal pain or discomfort may occur.

In case of any adverse events, kindly contact: pv@usv.in

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