



ORAL HEALTH RELATION WITH DIABETES MELLITUS

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ABSTRACT:

Chronic metabolic disease known as diabetes mellitus is a major source of morbidity and mortality in the modern world and is spreading like wildfire. Approximately 422 million people worldwide have diabetes mellitus. Patients with diabetes may experience several health consequences, including retinopathy, neuropathy, nephropathy, and cardiovascular disease. Patients with diabetes mellitus have been found to have oral health complications. Over 90% of diabetic patients experienced oral problems, according to research. According to another study, patients with diabetes mellitus have a higher prevalence of oral mucosal disorders than people without the disease: 45–88% of patients with type 2 diabetes had these conditions, compared to 38.3–45% of non-diabetic subjects, and 44.7% of people with type 1 diabetes had these conditions, compared to 25% of people without the disease. Periodontal disease, dental caries, oral infections, taste dysfunction, anomalies of the tongue, delayed wound healing, halitosis, and lichen planus are among the oral issues that affect diabetics. Those with uncontrolled diabetes who have oral problems are more likely to have neuropathy, small artery damage, impaired neutrophil function, and high salivary glucose levels. A healthy mouth is essential to a healthy lifestyle. Patients with diabetes have a decline in their quality of life due to oral problems. Even higher blood glucose levels are a result of complications such as periodontal disease, which has a reciprocal association with diabetes mellitus. The purpose of this article is to raise awareness about the oral health of diabetics and to emphasize the significance of keeping good oral hygiene, implementing preventative measures, identifying oral difficulties early on, and managing these patients' oral complications appropriately using a multidisciplinary approach.

Keywords: Diabetes mellitus, hyperglycemia, oral complications, periodontal disease, salivary dysfunction, dental caries, halitosis, oral lichen planus infection, awareness, multidisciplinary approach

Introduction :

Diabetes is a chronic metabolic disorder characterized by elevated levels of blood glucose due to a malfunction in insulin production or utilization within the body. It affects over 400 million people worldwide and has been linked to numerous complications, including poor oral health outcomes. Oral health is essential for overall well-being, as it plays a vital role in digestion, communication, and self-esteem. Many studies have documented the relationship between diabetes and dental issues such as periodontal disease, tooth loss, and xerostomia. Understanding the impact of diabetes on oral health outcomes is vital for healthcare providers to deliver comprehensive care to patients with diabetes. By addressing the oral health needs of individuals with diabetes, we can potentially improve their quality of life and reduce the risk of systemic complications. (1)

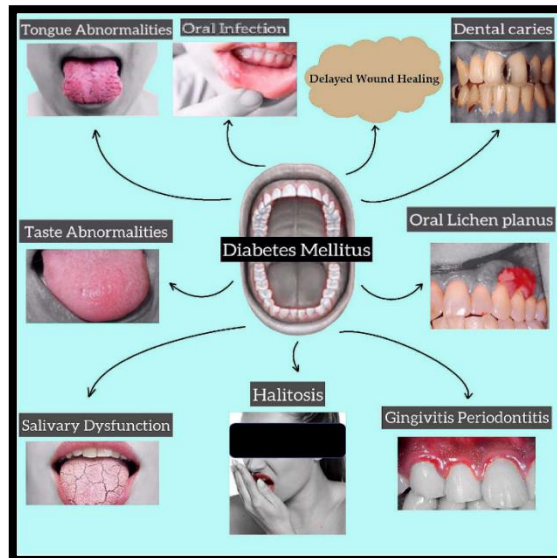


Fig.1: Complication oral cavity related to diabetes mellitus (26)

Impact of Diabetes on Oral Health

Poor adherence to medication regimens among individuals with type 2 diabetes, as highlighted in a study (Jandrić-Kočić et al., 2023), can have significant implications for their overall health outcomes. Factors such as gender, age, education level, and location of residence play a crucial role in determining adherence rates. Addressing barriers to adherence, especially related to gender differences, is imperative to improve health outcomes in this population. (2) Furthermore, the choice of oral diabetes medications, such as sulfonylureas, can also impact mortality rates among individuals with well-controlled diabetes and coronary artery disease (Berkowitz et al., 2018). The potential association between sulfonylurea use and increased mortality underscores the importance of carefully considering medication options to optimize patient outcomes. Understanding and addressing these complexities are essential in managing diabetes and its related complications, including its impact on oral health. (3)

Relationship between Diabetes and Periodontal Disease

Research on the relationship between diabetes and periodontal disease reveals a complex interplay with significant implications for oral health outcomes in patients with diabetes. According to (Robertson et al., 2011), individuals with type 1 diabetes mellitus (T1DM) exhibit a greater extent and severity of periodontitis, especially those with poor glycemic control, highlighting the impact of diabetes on periodontal health. Additionally, (Robertson et al., 2011) demonstrates that diabetic subjects develop periodontitis at a younger age compared to non-diabetic individuals, underscoring the early onset and chronic nature of periodontal disease in diabetes. Furthermore, it emphasizes the importance of understanding, treating, and preventing periodontitis in diabetic patients, given its potential to reduce oral health-related quality of life and its links to systemic diseases. (4)

This evidence underscores the need for targeted oral health interventions and collaborative efforts among healthcare professionals to address the heightened risk of periodontal disease in patients with diabetes and enhance their overall oral health outcomes.



Fig.2: Periodontal abscess in a 46 in patient with type 1 diabetes.(27)

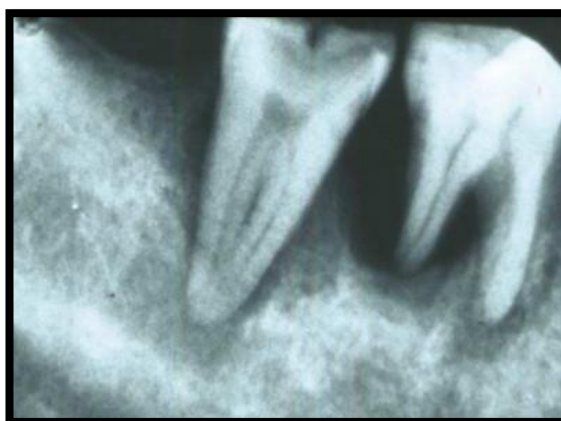


Fig.3: Radiograph of fig.2 showing rapid and aggressive periodontitis with bone loss. (28)

SALIVARY DYSFUNCTION

Xerostomia is the subjective issue of dry mouth, while hyposalivation is the objective decrease in salivary flow.(5)Infections (HCV, HIV/AIDS), neurological diseases (Parkinson's disease, depression), metabolic disorders (anemia, bulimia, dehydration), inflammatory conditions (rheumatoid arthritis, systemic lupus erythematosus, Sjögren syndrome), and other conditions like sarcoidosis are among the systemic disorders associated with Xerostomia.(5)(6) Research has revealed a connection between Xerostomia and Diabetes Mellitus (Type 1 and Type 2).(6)(7) Xerostomia may arise in

patients with uncontrolled diabetes due to consequences such as autonomic neuropathy, changes in salivary gland anatomy, and inflammatory alterations brought on by hyperglycemia.(8)(9)This could result in a drop in salivary flow rate and composition.(10)Individuals experiencing xerostomia experience glossitis, cervical caries, cracked lips. Their life further deteriorates developing dysgeusia, oral pain and more periodontal problems. (5)



Fig.4: Diabetic patient with salivary hypofunction, xerostomia, dental caries. (29)

POOR WOUND HEALING

Patients with uncontrolled diabetes have poor oral wound healing and related long-term consequences. (11). Damage to tiny blood vessels is the cause of diabetes's chronic problems. Cells that carry out an inflammatory activity and protect the body from infectious pathogens are deprived of nutrients when there is an inadequate blood supply.92% When there is inflammation, unhealthy or damaged tissues are removed, making room for healthy tissue. Blood sugar spikes that last for a short while paralyze defense cells in the body, leaving it vulnerable to inflammation and infection. Hyperglycemia in those with uncontrolled diabetes inhibits the body's ability to repair and regenerate tissue. (11-13)

HALITOSIS

One of the early signs of diabetes is halitosis, or foul breath, which is a characteristic ketone scent in diabetics. Sulfide chemical odor can also result from periodontal disease. Oxidative stress brought on by elevated blood levels of methyl nitrate and fatty acids results in halitosis. (14) According to a 2015 study, halitosis affected 23.3% of the study participants who were diabetic.

ORAL LICHEN PLANUS

A chronic inflammatory skin lesion is called lichen planus. (15) The lesion is characterized by polygonal, flat-topped, polygonal, violaceous plaques and papules that can occur throughout the body, including the oral cavity. The oral cavity lesion manifests as white elevated lines that form a bilateral, symmetrical lace-like pattern.(16) Research has revealed that persons with diabetes often have oral lichen planus.(17,18) An oral lichenoid reaction is another mucosa-related alteration that could negatively impact oral hypoglycemic medications given to diabetic patients.(19,20) The autoimmune condition known as oral lichen planus causes the basal cells of the oral cavity's epithelium to undergo apoptosis, which is facilitated by cytotoxic T lymphocytes.(21) Individuals with oral lichen planus may feel discomfort and burning sensation in mouth leading to difficulty in swallowing.(22)



Fig.5: Oral reticular lichen planus in patient with type2 diabetes (30)

Oral Health Management Strategies for Patients with Diabetes

Studies have shown that the management of diabetes mellitus type 2 in primary care settings poses a multifaceted challenge, requiring a balance between short- and long-term quality of life and the demands of daily self-management (Cilia et al., 2007). Patient diabetes education (PDE) emerges as a pivotal component in maintaining glycemic control and enhancing overall quality of life for individuals with diabetes. (23) In exploring effective strategies for optimizing care, collaborative approaches, such as team-based interventions involving nurses and general practitioners, have demonstrated promising outcomes in improving follow-up procedures and glycemic control (Engin Yilmaz et al.). (24) Furthermore, such team-based models within oral health management strategies for diabetic patients could potentially enhance overall care coordination and treatment outcomes. By leveraging interdisciplinary teamwork and evidence-based interventions, healthcare providers can elevate the quality of care and address the complex needs of individuals with diabetes in a comprehensive manner. (25)

Conclusion

In conclusion, the findings of this study suggest a significant relationship between diabetes and oral health outcomes. Patients with diabetes have been shown to have a higher prevalence of periodontal disease, dental caries, and other oral health issues compared to individuals without diabetes. This highlights the importance of regular dental screenings and preventative measures for individuals with diabetes to improve their overall oral health and quality of life. Additionally, the link between diabetes and oral health underscores the need for a collaborative approach between healthcare providers, including dentists and physicians, to better manage the oral health of patients with diabetes. Future research should continue to explore the mechanisms underlying the connection between diabetes and oral health, as well as the effectiveness of interventions aimed at improving oral health outcomes in this population.

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