TREATMENT OF ORAL DISEASES IN PATIENTS WITH DIABETES MELLITUS

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Annotation. This article analyzes modern approaches to the treatment of oral diseases in patients with diabetes mellitus based on scientific literature, clinical guidelines, and international consensus documents. Diabetes mellitus is one of the most prevalent chronic diseases worldwide, significantly impacting oral health. Patients with diabetes have an elevated risk of developing periodontitis, dental caries, xerostomia, oral infections, and delayed wound healing. The article examines the bidirectional relationship between diabetes and oral diseases, the impact of hyperglycemia on periodontal tissues and immune response, the specific considerations for treatment planning in this patient population, methods of non-surgical and surgical periodontal therapy, the use of systemic antibiotics and host-modulating agents, as well as the importance of interdisciplinary collaboration between dentists and endocrinologists. Special attention is given to prevention strategies and the integration of oral health care into comprehensive diabetes management.

Keywords: diabetes mellitus, periodontitis, dental treatment, hyperglycemia, glycated hemoglobin, interdisciplinary approach, periodontal therapy, xerostomia, wound healing.

Diabetes mellitus is one of the most prevalent chronic non-communicable diseases worldwide, characterized by chronic hyperglycemia resulting from defects in insulin secretion or action. According to the World Health Organization, the prevalence of diabetes is steadily increasing, making its complications increasingly relevant to all areas of medicine, including dentistry. The oral manifestations of diabetes are diverse and include periodontitis, dental caries, xerostomia (dry mouth),

taste disturbances, increased susceptibility to infections (including candidiasis), and delayed wound healing after dental procedures. The relationship between diabetes and oral diseases is bidirectional: hyperglycemia exacerbates the course of oral diseases, while the presence of periodontitis and other oral infections negatively impacts metabolic control of diabetes. This article provides a comprehensive review of modern approaches to the treatment of oral diseases in patients with diabetes mellitus, based on current clinical recommendations and scientific research.

Diabetes mellitus exerts a complex negative impact on oral health. Elevated blood glucose levels create a favorable environment for bacterial growth in the oral cavity, promoting plaque formation and the development of inflammatory processes. Hyperglycemia leads to disruption of the microbial balance, alterations in saliva composition, and reduced local immunity. Saliva in diabetic patients often contains elevated glucose levels, which further promotes the growth of pathogenic microorganisms. The characteristic microcirculatory impairment and reduced immune response in diabetes slow down tissue healing processes—even minor injuries to the oral mucosa may heal significantly longer than usual. The main oral problems associated with diabetes include an increased risk of dental caries, periodontitis and gingivitis that progress in a more severe form, delayed healing of wounds and ulcers in the oral cavity, fungal infections (particularly candidiasis), burning mouth syndrome, and altered taste perception.

The most significant and prevalent oral complication of diabetes is periodontitis—a chronic destructive inflammation of the periodontal tissues leading to tooth loss. Numerous epidemiological studies confirm that patients with diabetes have an increased risk of developing periodontitis and experience more severe disease progression. According to the consensus report of the International Diabetes Federation (IDF) and the European Federation of Periodontology (EFP), the

relationship between periodontitis and diabetes is bidirectional.1 Individuals with periodontitis have an elevated risk of developing dysglycemia and insulin resistance. In patients with diabetes, the presence of periodontitis is associated with higher levels of glycated hemoglobin (HbA1c). The mechanisms underlying this relationship include elevated levels of pro-inflammatory cytokines (IL-1β, TNF-α, IL-6), oxidative stress, and activation of Toll-like receptors. Hyperglycemia and periodontitis mutually and adversely affect each other. Importantly, periodontitis also increases the risk of developing microvascular and macrovascular complications of diabetes, as well as mortality.

Non-surgical periodontal therapy (NSPT) is the cornerstone of periodontal disease treatment in patients with diabetes. This therapy includes scaling and root planing (deep cleaning) to remove calculus and bacterial plaque above and below the gum line. Numerous studies and meta-analyses confirm that non-surgical periodontal therapy not only improves periodontal parameters but also contributes to a reduction in HbA1c levels in patients with prediabetes and diabetes. According to the IDF and EFP consensus recommendations, periodontal therapy is safe and effective in patients with diabetes and is associated with a reduction in HbA1c of 0.27–0.48% at 3 months. Treatment of periodontitis can lower blood glucose levels in patients with type 2 diabetes almost as much as adding a second oral hypoglycemic agent to metformin. Treatment of inflammatory oral diseases, including non-surgical periodontal therapy and extraction of infected teeth, can lead to clinically significant reductions in blood glucose levels. The American Diabetes

1 Sanz M., Ceriello A., Buysschaert M. et al. Scientific evidence on the links between periodontal diseases and diabetes: consensus report and guidelines of the joint workshop on periodontal diseases and diabetes by the International Diabetes Federation and the European Federation of Periodontology // Journal of Clinical Periodontology. – 2018. – Vol. 45, № 2. – P. 138–149.

Association recommends intensive periodontal treatment, which may improve glycemic control, with HbA1c reduction from 8.3% to 7.8%.2

An important advancement in the treatment of periodontitis, including in patients with diabetes, is the application of host-modulating therapy (HMT). The only HMT agent approved by the U.S. Food and Drug Administration (FDA) for the treatment of periodontitis is a non-antimicrobial low-dose formulation of doxycycline (Periostat®; 20 mg twice daily). Low-dose doxycycline not only improves insulin resistance, fasting glucose levels, insulin levels, and lipid profiles but also improves pancreatic islet morphology and increases glucose-stimulated insulin secretion.3 Chemically modified curcumins are also being investigated as promising compounds for HMT, having demonstrated safety and efficacy in preclinical studies.

Treatment of patients with diabetes requires careful planning and coordination between the dentist and endocrinologist. Before initiating dental treatment, it is essential to assess the level of diabetes control—glycated hemoglobin (HbA1c) levels and blood glucose levels. Well-controlled diabetes (HbA1c < 7%) significantly reduces the risk of complications. The optimal time for dental treatment is in the morning hours when blood glucose levels are most stable. The dentist should obtain complete information about the type of diabetes, medications used, glycated hemoglobin levels, and the presence of complications. In cases of decompensated diabetes (HbA1c > 7%), elective dental procedures should be deferred until glycemic control is achieved. Monitoring blood glucose immediately before treatment helps avoid hypoglycemic episodes during the procedure. Patients are

2 American Diabetes Association. Standards of Medical Care in Diabetes—2024 // Diabetes Care. – 2024. – Vol. 47, Suppl. 1.

3 Gu Y., Golub L.M., Lee H.M., Walker S.G. Diabetes, periodontal disease, and novel therapeutic approaches — host modulation therapy // Frontiers in Clinical Diabetes and Healthcare. – 2025. – Vol. 6. – Art. 1529086.

advised to maintain their regular meal schedule and not to skip their hypoglycemic medications before the dental visit.

When selecting treatment methods for patients with diabetes, preference is given to minimally invasive techniques with minimal tissue trauma. Medications that do not affect carbohydrate metabolism and are compatible with diabetes therapy are prescribed. Special attention is given to the prevention and treatment of periodontal diseases. The choice of anesthetic requires special consideration: local anesthetics with epinephrine may raise blood glucose levels, so their use should be limited to the minimum effective dose. Due to delayed wound healing and an increased risk of infections, dentists often extend the course of antibiotic therapy for such patients. Postoperative care includes the prescription of antiseptics and healing-promoting agents, monitoring wound status, and regular follow-up to assess treatment effectiveness.

Patients with diabetes generally have lower dental implant survival rates compared to non-diabetic patients. However, well-controlled diabetes (HbA1c < 7%) allows for implant survival rates comparable to those of non-diabetic patients: 95–96% at 5 years and 92–94% at 10 years.[4] Studies indicate that with good glycemic control, implant survival at 6 years is 98.0–98.8%. Literature reviews report survival rates ranging from 90.2% to 100% in the short and medium term and 91.9% in the long term. However, poor metabolic control is associated with an increased risk of peri-implantitis and greater bone loss. Patients with diabetes show higher rates of peri-implantitis (10% versus 4% in non-diabetic patients). Thus, implant placement in diabetic patients requires a careful interdisciplinary approach and strict maintenance therapy protocols.

4 Effect of Glycemic Control on the Incidence of Dental Implant Complications in Diabetic Patients. – 2025.

Prevention of oral complications in patients with diabetes is based on several key principles. Thorough oral hygiene includes regular brushing with a soft toothbrush at least twice daily and the use of adjunctive aids (dental floss, irrigators). Toothpastes with antibacterial components are recommended. Regular preventive dental check-ups at least twice a year are essential for early detection and management of oral problems. Balanced nutrition and strict glycemic control form the foundation of prevention. Patients are advised to drink adequate water to combat xerostomia, to quit smoking, and to avoid sugary beverages and alcohol-containing mouthwashes. The use of specialized mouthwashes and gels to protect the oral mucosa also helps reduce the risk of complications. Patients are advised to seek immediate dental attention if they notice white patches in the mouth, pus discharge, dryness, halitosis, pain or bleeding gums during brushing, changes in occlusion, or tooth mobility.

The dental team plays a key role in the long-term management of patients with diabetes. Dentists, hygienists, and assistants can contribute to the early detection of metabolic disturbances, enhance patient self-management, and reduce inflammatory burden through structured preventive care. Coordinated workflows that integrate periodontal therapy, patient education, metabolic assessment, and interprofessional communication contribute to improved glycemic control and overall health outcomes. Comprehensive dental management is a central component of chronic disease care in patients with diabetes. Integrated team-based approaches improve diagnostic accuracy, support long-term behavioral changes, and reduce both oral and systemic complications.

In conclusion, the treatment of oral diseases in patients with diabetes mellitus requires a comprehensive interdisciplinary approach that accounts for the bidirectional relationship between metabolic control and oral health. Effective treatment of periodontal diseases not only improves oral health but also contributes to the reduction of glycated hemoglobin levels, improving glycemic control. Key

elements of successful management of such patients include thorough preoperative assessment (including HbA1c levels), selection of minimally invasive treatment methods, interdisciplinary collaboration between dentists and endocrinologists, and active patient participation in maintaining oral hygiene and glycemic control. Modern treatment modalities include non-surgical periodontal therapy, systemic antibiotic support, host-modulating therapy, and, under conditions of good glycemic control, dental implantation. Prevention of oral complications, based on regular check-ups, meticulous hygiene, and control of risk factors, is the foundation for long-term preservation of oral health in patients with diabetes mellitus. The integration of dental care into comprehensive diabetes management is recognized not merely as a clinical recommendation but as a strategic public health priority.

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