

**DESTRUCTIVE CHANGES IN PERIODONTAL TISSUES IN DIABETES
MELLITUS**

Rajabzoda Parvina

Asia International University
aliyevafotima2024@gmail.com

Abstract: the article discusses the pathogenetic mechanisms of the relationship between type 2 diabetes mellitus and inflammatory periodontal diseases. Chronic hyperglycemia, microcirculation disorders, immunodeficiency, and oxidative stress play a key role in the progression of periodontitis. Clinical manifestations in diabetic patients include more pronounced inflammatory changes and rapid progression of tissue destruction. Approaches to diagnosis and treatment are discussed, including the need for interdisciplinary collaboration between dentists and endocrinologists.

Keywords: diabetes mellitus, periodontitis, hyperglycemia, inflammation, dentistry.

Introduction. Type 2 diabetes mellitus (DM) is a chronic metabolic disease that affects 10% of the adult population according to WHO (2023). One of the most common complications in diabetic patients is inflammatory periodontal diseases such as gingivitis and periodontitis. Periodontitis, in turn, contributes to the deterioration of glycemic control, creating a vicious circle between these two pathologies. The purpose of this article is to investigate the clinical and pathogenetic relationship between type 2 diabetes and periodontitis, as well as to propose modern diagnostic and therapeutic approaches based on current research. **Materials and methods.** The study uses data from scientific publications over the past 10 years, including sources from the PubMed, Scopus, and RSCI databases. More than 50 articles on the systemic effects of diabetes and its effects on the oral cavity have been analyzed. Special attention is paid to studies of the clinical relationship between periodontal inflammation and glycemic levels. **Results and discussion.**

I. The pathogenesis of the relationship between diabetes and periodontitis.

1. **Hyperglycemia and vascular changes.** Chronic hyperglycemia causes glycation of proteins and lipids to form glycation end products (AGEs). These substances bind to RAGE receptors on endothelial cells and immune cells, enhancing the production of pro-inflammatory cytokines (IL-1b, TNF- α). This leads to:

- Reduction of microcirculation in periodontal tissues,
- Impaired tissue healing.

2. **Immune disorders.** Patients with diabetes have neutrophil dysfunction, decreased phagocytic activity of macrophages, and increased levels of proinflammatory mediators. These processes contribute to the development of chronic inflammation in periodontal tissues and loss of alveolar bone. **Oxidative stress.** Excessive production of reactive oxygen species (ROS) under conditions of hyperglycemia increases inflammation and tissue damage. ROS also inhibit osteoblastic activity, contributing to the destruction of bone tissue.

II. **Clinical features of periodontal inflammation in diabetic patients.** Studies have shown that periodontitis is more aggressive in diabetic patients.: The rate of progression: Periodontal tissue loss occurs 2-3 times faster than in patients without diabetes. **Risk of complications:** high levels of glucose in saliva increase the risk of bacterial colonization (*P. gingivalis*, *T. denticola*). **Bone destruction:** according to the Gurav study (2021), 80% of diabetic patients have alveolar bone resorption.

III. **Modern approaches to diagnosis.**

1. Early biomarkers. The use of levels of pro-inflammatory cytokines (IL-6, CRP) and glycation products (AGEs) as markers of inflammation. 2. System diagnostics. Integration of dental examinations with determination of HbA1c levels for glycemic control is recommended.

IV. Treatment of inflammatory periodontal diseases in patients with type 2 diabetes. 1. Local therapy. The use of antiseptics (chlorhexidine) and antibiotics to suppress microflora. The use of drugs with antioxidant activity (ascorbic acid).

2. Systemic therapy. Improvement of glycemic control with metformin and insulin therapy. The use of drugs that reduce systemic inflammation (IL-1b inhibitors).

3. Innovative approaches. Local application of growth factors (PDGF) to stimulate tissue regeneration. The use of laser therapy to improve microcirculation and reduce inflammation. Conclusions. Type 2 diabetes mellitus has a significant effect on the course of periodontal inflammatory diseases, increasing their severity and accelerating their progression. Effective treatment of patients with periodontitis and diabetes requires an interdisciplinary approach, including monitoring the systemic condition and the use of innovative therapies.

References

1. Axmedova, M. (2024). CONDITION OF THE ALVEOLAR PROCESS AND PERIOSTE WHEN USING REMOVABLE DENTURES. EUROPEAN JOURNAL OF MODERNMEDICINEANDPRACTICE,4(11), 528-538.
2. Qilichevna, A. M. (2024). COMPARATIVE ANALYSIS OF NUTRITIONAL DISPARITIES AMONG PEDIATRIC POPULATIONS: A STUDY OF CHILDREN WITH DENTAL CAVITIES VERSUS THOSE IN OPTIMAL HEALTH. Central Asian Journal of Multidisciplinary Research and Management Studies, 1(2), 30-34.
3. Ahmedova, M. (2023). COMPARATIVE ANALYSIS OF NUTRITIONAL DISPARITIES AMONG PEDIATRIC POPULATIONS: A STUDY OF CHILDREN WITH DENTAL CAVITIES VERSUS THOSE IN OPTIMAL HEALTH. International Bulletin of Medical Sciences and Clinical Research, 3(12), 68-72.
4. Ahmedova, M. (2023). DIFFERENCES IN NUTRITION OF CHILDREN WITH DENTAL CARIES AND HEALTHY CHILDREN. International Bulletin of Medical Sciences and Clinical Research, 3(12), 42-46.
5. Akhmedova, M. (2023). USE OF COMPUTER TECHNOLOGIES AT THE STAGES OF DIAGNOSTICS AND PLANNING OF ORTHOPEDIC TREATMENT BASED ON ENDOSSALIMPLANTS. Central Asian Journal of Education and Innovation, 2(11 Part 2), 167-173. 798 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 4
6. Axmedova, M. (2023). USE OF COMPUTER TECHNOLOGY AT THE STAGES OF DIAGNOSIS AND PLANNING ORTHOPEDIC TREATMENT BASED ON ENDOSSEAL IMPLANTS. International Bulletin of Medical Sciences and Clinical Research, 3(11), 54-58.
7. Akhmedova, M. (2020). ENDOTHELIAL FUNCTION DISORDERS IN THE DEVELOPMENT OF APHTHOUS STOMATITIS. Achievements of Science and Education, (18(72)), 65-69.
8. Axmedova, M. (2023). THE IMPACT OF SOCIOCULTURAL FACTORS ON THE PERVASIVENESS OF DENTAL CARIES AS A COMPLEX HEALTH CONDITION IN 1284 CONTEMPORARY SOCIETY. International Bulletin of Medical Sciences and Clinical Research, 3(9), 24-28.
9. Akhmedova, M. K. (2024). MAIN PREVENTIVE METHODS OF PERIODONTAL TISSUES IN CHILDREN AND ADOLESCENTS. EDUCATION SCIENCE AND INNOVATIVE IDEAS IN THE WORLD, 41(5), 254-260. 456 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 3

JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS

VOLUME 04, ISSUE 11
MONTHLY JOURNALS



ISSN NUMBER: 2751-4390

IMPACT FACTOR: 9,08

10. Akhmedova, M., Kuzieva, M., & Kurbanova, N. (2025). TEMPOROMANDIBULAR JOINT DISEASES AND DIAGNOSIS FORMULATION. *Modern Science and Research*, 4(1), 279-289.
11. Axmedova, M. (2025). DISEASES OF THE TEMPOROMANDIBULAR JOINT AND FORMULATION OF DIAGNOSIS. *Modern Science and Research*, 4(1), 290-3.
12. Akhmedova, M., Kuzieva, M., & Khalilova, L. (2025). THE STATE OF THE ALVEOLAR PROCESS AND PERIOSTA WHEN USING REMOVABLE DENTURES. *Modern Science and Research*, 4(1), 301-310. 1284 ResearchBib IF- 11.01, ISSN: 3030 3753, Volume 2 Issue 5