CLINICAL AND MORPHOLOGICAL CHANGES IN THE MUCOSA OF THE ORAL CAVITY IN TYPE 1 DIABETES MELLITUS

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https://doi.org/10.5281/zenodo.17526728

Introduction: Type 1 diabetes mellitus (T1DM) is a chronic autoimmune endocrine disorder characterized by absolute insulin deficiency and persistent hyperglycemia. The oral cavity is highly sensitive to systemic metabolic dysregulation, and diabetic patients frequently develop pathological changes in the oral mucosa due to microangiopathy, neuropathy, immune dysfunction, and oxidative stress. Chronic hyperglycemia disrupts tissue turnover, increases susceptibility to infections, and impairs wound healing, predisposing patients to conditions such as xerostomia, candidiasis, periodontal disease, and mucosal ulcerations. Morphological alterations, including epithelial atrophy, increased keratinization, intracellular edema, and microvascular changes, are key indicators of oral mucosal involvement in T1DM. Understanding clinical and histopathological patterns of mucosal alterations in T1DM is essential for early diagnosis, prevention of complications, and effective dental management, as oral manifestations often precede systemic metabolic imbalance and may signal poor glycemic control.

Objective: To assess clinical and morphological changes in the oral mucosa of patients with type 1 diabetes mellitus and identify associations between mucosal abnormalities and metabolic disease severity.

Materials and Methods: A total of 60 subjects aged 18–45 years were examined, including 40 patients diagnosed with T1DM and 20 systemically healthy controls. Clinical examination involved assessment of oral mucosa, saliva secretion, lesion type and distribution, periodontal condition, and subjective symptoms including dryness, burning sensation, and taste disturbances. Cytological smears and histological biopsies were analyzed to evaluate epithelial thickness, keratinization patterns, inflammatory cell infiltration, vascular alterations, and presence of fungal organisms. Blood glucose levels, HbA1c, and disease duration were recorded to assess metabolic status. Statistical analysis determined correlations between clinical findings and histopathological markers.

Results: Patients with T1DM demonstrated a significantly higher prevalence of xerostomia, mucosal dryness, fissuring, angular cheilitis, recurrent aphthous lesions, and candidiasis compared to controls. Histological evaluation revealed epithelial atrophy, hyperkeratosis, intracellular edema, increased inflammatory infiltrates, and microvascular abnormalities, including thickened capillary walls and endothelial swelling. Cytological smears showed increased nuclear–cytoplasmic ratio, epithelial dyskeratosis, and higher Candida colonization. Severity of mucosal changes positively correlated with elevated HbA1c levels and disease duration, with patients having poor glycemic control exhibiting more pronounced epithelial atrophy and inflammatory infiltration.

Discussion: The findings confirm that T1DM leads to significant clinical and morphological alterations in the oral mucosa due to chronic hyperglycemia–induced metabolic dysregulation, reduced salivary gland function, impaired immune response, and vascular changes. These alterations increase susceptibility to infections, delay epithelial repair, and contribute to

chronic inflammatory processes. Early recognition and targeted oral care strategies can improve patient outcomes, reduce periodontal and mucosal complications, and support systemic disease management. Routine dental monitoring, combined with strict metabolic control, antifungal therapy, salivary stimulants, and mucosal protectants, is essential in maintaining oral health in diabetic patients.

Conclusion: Type 1 diabetes mellitus is associated with distinct clinical and morphological changes in the oral mucosa, reflecting systemic metabolic imbalance. Patients demonstrate higher rates of xerostomia, mucosal lesions, candidiasis, and vascular and epithelial abnormalities. These findings highlight the importance of comprehensive oral examination in diabetic patients for early detection of disease activity and prevention of chronic complications. Collaboration between endocrinologists and dental specialists is necessary to ensure effective management and improve quality of life in individuals with T1DM.

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