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DENTAL CARIES: ETIOLOGY, PREVENTION, AND TREATMENT METHODS

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Abstract. This article focuses on investigating the etiological factors of dental caries, prevention strategies, and treatment modalities, with particular emphasis on morphological changes in the oral cavity. Caries is a pathological condition characterized by the demineralization and destruction of tooth enamel. The article examines dental caries as one of the most prevalent oral diseases that poses significant threats to human health. The historical development of caries research dates back to the late 19th and early 20th centuries, with significant contributions made by the American scientist Greene Vardiman Black, who established an independent scientific approach to stomatology. According to Black's classification system, caries is categorized into six distinct classes. This article analyzes the morphological and functional alterations of caries in its various manifestations and their impact on human health. Through stomatological examinations, the research investigates cellular damage to hard dental tissues, crown portions, and cusps, along with similar pathological processes. The findings of this study contribute to a deeper understanding of caries and will be instrumental in developing effective treatment protocols. The analyses presented in this article will be crucial for identifying convenient and accessible stomatological treatment methods for oral cavity diseases and improving diagnostic and therapeutic approaches for caries management.

Keywords: Caries, dental caries, tooth enamel, oral cavity, morphological changes, treatment methods, prevention, stomatological examinations, hard tissues, tooth crown, cusps, Greene Vardiman Black, Black classification, caries classes, scientific analysis, caries diagnosis, prophylaxis, functional changes.

Introduction

Caries is a pathological process observed after tooth eruption, characterized by demineralization and destruction of hard dental tissues, resulting in cavitation formation in the tooth structure. According to literature, this disease has existed for approximately 2,500-3,000 years before our era.

Caries is classified into six classes according to Black's classification system:

Class I Caries (Black Classification): Occurs in the fissures and pits of the occlusal surfaces of posterior teeth and the lingual or palatal surfaces of anterior teeth. Class I caries is predominantly observed in the occlusal surfaces of molars and premolars within fissures and pits, as well as in the lingual or palatal grooves of incisors and canines.

Class II Caries (Black Classification): Located on the proximal surfaces of molars and premolars.

Class III Caries (Black Classification): Found on the proximal surfaces of incisors and canines that do not extend to the incisal edge. The tooth angles remain intact.

Class IV Caries (Black Classification): Involves the proximal and incisal surfaces of incisors and canines with destruction of the tooth angle.

Class V Caries (Black Classification): Located in the cervical region of all teeth.

Class VI Caries (Black Classification): Situated on the incisal edges of anterior teeth and the occlusal cusps of posterior teeth. In contemporary literature, Class VI carious cavities have been additionally incorporated into Black's classification system.

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Currently, the incidence of caries is dramatically increasing due to harmful chemical products in the external environment. Another contributing factor to caries development is the frequent consumption of sugary products, particularly various types of confectionery. When tooth enamel is thin or lacks adequate minerals, susceptibility to caries increases. Additionally, poor oral hygiene practices, including inadequate tooth cleaning, lead to bacterial proliferation, resulting in dental calculus formation and caries progression.

According to global statistics, approximately 2.3 billion people worldwide suffer from caries in permanent teeth. Caries is considered one of the most widespread chronic diseases globally. Currently, it represents one of the most prevalent diseases among the population of Uzbekistan, particularly in children. The prevalence of caries among 6-year-old children constitutes 87.76%, while among 12-year-old children, this indicator reaches 68.04%.

Prevention of Caries

To prevent caries, we must primarily maintain oral hygiene. Specifically, teeth should be brushed twice daily, morning and evening, using fluoride toothpaste. Interdental areas should be cleaned using dental floss, which is particularly important for proximal surfaces. Patients should be advised to replace their toothbrush every three months. To prevent dental caries, consumption of sugary, sticky caramels, candies, and carbonated beverages should be limited, while intake of fruits, vegetables, and calcium-rich products should be increased. Following meals, the oral cavity should be rinsed with water. For caries prevention, dental examinations should be conducted every six months.

Treatment of Caries

Caries treatment involves cavity preparation and restoration with filling materials.

The general treatment approach for caries initially addresses the primary etiological factors, eliminates the general cariogenic conditions in the organism, and enhances the body's immunobiological capacity. In caries treatment, antimicrobial intervention is prioritized. Treatment begins with the excavation of necrotic tissue, specifically the removal of pathologically altered enamel and dentin, and preparation of the cavity to restore the tooth's anatomical form and function.

The fundamental principles of cavity preparation were initially established in the early 19th century by American dentist Greene Vardiman Black. Black's primary principles included:

Removal of unsupported enamel: Elimination of overhanging enamel margins to prevent fracture.

Removal of carious dentin: Complete excavation of infected dentin.

Prophylactic extension: Preventive extension to immune zones to prevent recurrent caries.

Retention form: Creating a box-like cavity shape to ensure filling stability under masticatory forces.

Contemporary stomatologists favor the biological acceptability approach (Lukomsky I.G.), which does not require extension to immune zones. This method advocates for excavation of enamel and dentin only to healthy tissue boundaries.

Caries treatment involves anesthesia, cavity opening and extension, enamel margin finishing, medicament application, placement of protective base, permanent restoration, and final finishing procedures. Modern stomatology differs significantly from traditional approaches, as contemporary treatments are performed without patient discomfort due to effective anesthetic agents. Current caries treatment is conducted with superior techniques, utilizing advanced filling materials and tooth-colored restorations.

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