МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

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з міжнародною участю
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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MOLECULAR GENETIC PREDICTORS OF DENTAL CARIES IN CHILDREN

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Introduction. Many factors lead to the caries development, one of which is a disorder of the hard tissue structure during its formation. Defects in the embryonic enamel development are almost irreparable. Among patients, there are people with genetically determined incomplete amelogenesis, which is associated with a defect in the AMELX gene in the chromosomes of enameloblasts. As a result, the amino acid composition of the synthesised amelogenins changes, and the growth of crystals on the organic matrix is impaired.

The aim of the study was to study the molecular genetic predictors of dental caries in children of Bukovyna region.

Material and methods. The dental examination was carried out in children aged 6 years. Children were divided into groups depending on the residence region and caries intensity level, namely 75 examined in Vyzhnytsia district, 89 examined in Dniester district and 51 examined in Chernivtsi district. During the dental examination, samples of buccal epithelium were taken. The real-time reverse transcription polymerase chain reaction method was used to analyze gene expression using the AMELX, Human amelogenin, Real Time PCR Primer Set and DSPP, Human dentin sialophosphoprotein, Real Time PCR Primer Set primer sets. The primer set ACTB, Human actin, beta, Real Time PCR Primer Set was used as a reference gene. The study was conducted on the BSMU educational and research laboratory basis.

Results. The buccal epithelium molecular genetic study revealed differences in the expression of AMELX gene mRNA in children from different regions of Bukovina. The highest level of gene mRNA expression was in children of Vyzhnytsia district (31.51±0.17). In the Dniester and Chernivtsi districts, the level of gene expression was lower by 1.74 and 5.36% compared to the data from the mountainous district. The gene expression level did not differ with an increase in the number of carious teeth. Our results indicate that the residents of Vyzhnytsia district have the strongest enamel genetically.

The results of the DSPP gene mRNA study indicate that the gene expression in children from Bukovyna is 16.43% higher compared to the normal gene. These results indicate that children have normal dentin development and no defects in its development.

The highest level of expression in children from Vyzhnytsia disrtict was (30.25±0.16) points, the lowest one was in children from Chernivtsi district (29.21±0.11). Depending on caries intensity level, we observed an increase in the number of genes from (28.38±0.14) in low to (30.69±0.14) in high caries intensity.

Conclusions. Thus, the results of the molecular genetic study indicate that children have no hereditary disorders of enamel and dentin. The highest level of mRNA expression of the AMELX gene was found in children from Vyzhnytsia district, indicating that this region has the strongest enamel genetically. The gene expression did not depend on the number of cariously affected teeth. With increasing caries intensity, the expression of DSPP gene mRNA increased.

Kuzniak N.B.

PREVENTION AND TREATMENT OF OCCLUSIVE DISTURBANCES OF THE JAWS AND PAIN DYSFUNCTION OF THE TEMPOROMANDIBULAR JOINTS

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Introduction. Every year the problem of dysfunctional conditions occurring in the temporomandibular joints (TMJ) increases against the ground of occlusive disturbances due to difficult eruption of third molars. A common approach to the treatment of difficult eruption of third molars and all the concomitant complications is to refer a patient to the Department of Maxillofacial Surgery with recommendation to remove third molars. In the process of observation, a conclusion

was drawn that removal of third molars with underlying occlusive disturbances does not always lead to the results expected.

The aim of the study. To improve the efficiency of dental aid delivery to patients with occlusive disturbances occurring due to difficult eruption of third molars with the aim to prevent further development and complications of TMJ painful dysfunction.

Materials and methods. All the patients were examined according the following algorithm: complaints, previous history and life history, inspection, palpation of TMJ projection areas while performing statistical and dynamic tests, manual assessment of the muscle tone, and assessment of the lateral and mediotrusion movements of the mandible in the horizontal and vertical planes.

Paraclinical methods of examination included electromyographic examination of the masticatory muscles, orthopantomogram, teleradiography of the lateral projection, computed tomography of the TMJ, biometry of the diagnostic models of the jaws followed by their analysis in the articulator. Central correlation, lateral and frontal occlusion was evaluated by means of wax registers and MPI analysis.

Results. During 2021-2024 on the base of the Department of Maxillofacial Surgery at Chernivtsi Regional Clinical Hospital 79 patients 12-25 years old were examined. They had certain occlusive disturbances occurring due to eruption of third molars. Based on the results of examination, all the patients were distributed into two groups: 1) those who were treated without removal of third molars (44 individuals); 2) those who were treated with removal of third molars (35 individuals).

The treatment of patients from the first clinical group started using splint therapy. 6 months after the treatment, 41,7% of patients, in case of complete absence of complaints and after repeated analysis of diagnostic models and TMJ condition, underwent orthodontic treatment with application of fixed appliances with the aim to introduce third molars into the dental arch and create full-fledged contacts. A year afterwards, 64 % of patients admitted improvement of their condition.

The treatment of patients from the second clinical group started with removal of retained third molars. One week after removal of third molars, electromyogram detected overload of the circular oral muscle and 30-35% increase of bioelectric activity of the temporal muscles. Analysis of the occlusive correlations of the jaws 2 weeks after removal of third molars found distal dislocation of the lower jaw. 6 months after the start of treatment, 75,7% of patients admitted improvement of their general condition and lack of painful sensations.

Conclusions. Removal of retained third molars with the aim to eliminate further aggravation of occlusive pathology and prevention of painful dysfunction of the TMJ is effective in 64,9% cases only. 13,5 % of clinical cases admitted exacerbation of the syndrome due to distalization of the lower jaw and decrease of the volume of the space inside the joint.

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MODERN APPROACH TO DISTAL OCCLUSION DIAGNOSIS

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Introduction. The use of artificial intelligence in orthodontics covers a wide range of tasks: from identifying anatomical and pathological structures of the dentition to supporting complex decision-making in the treatment process. Orthodontic planning is usually based on the doctors' clinical experience and professional skills. Today, artificial intelligence is actively used to analyze the structure of the facial skeleton, identify anatomical landmarks, analyze X-rays and 3D scans, determine bone age, and predict treatment outcomes. Cephalometric analysis, as one of the most complex traditional diagnostic methods, involves the identification of anatomical landmarks for geometric assessments in various planes. Although manual identification is still widely used, the application of artificial intelligence speeds up the processes, reducing the duration of the analysis and minimizing subjective errors.

The aim of the study was to use the artificial intelligence in the process of distal occlusion diagnosis.