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POSSIBILITY OF IMPROVING METHOD OF AGE DETERMINATION DURING PATHOLOGICAL ATTRITION

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Background: *Determination of biological age of a person plays a significant role in the forensic science, especially in the comparative and reconstructive identification antemortem and postmortem as recommended by Interpol / ICPO (International Criminal Police Organization) and FBI (Federal Bureau of Investigation). Bodies justice use the results to determine the age by dental status in an ethnically heterogeneous society where age indicators affecting the need and opportunity to benefit from the state budget socio-vulnerable persons, illegal immigrants and children; it also influenced on level of criminal responsibility of persons with regard to age limit. Age is the least variable and most probably accurate in determining indicator, since the aging process most independently reflected in changes of the pulp and hard tissues of the teeth than on any other functional systems of the body that are more vulnerable to the effects of pathologies features, constitution and physiological defects. Practical determining the age of adults is possible using morphological techniques of Gustafson G. ("Age determination on teeth"), Bang G., Ramm E. ("Determination of age in humans from root dentine transparency") Johanson G. ("Age determination from teeth"), Maples WR. ("An improved technique using dental histology for estimation of adult age"), and morphologically-radiographic techniques of Solheim T. ("A new method for dental age estimation in adults"), Kvaal SI et al ("Age estimation of adults from dental radiographs"). The most accurate in calculating and rational method is Kvaal et al. technique, which involves calculating ratio of length of crown and root to the length of the pulp, width of the root to the width of the pulp in specifically designated locations, search averages and the use of standardized coefficients for the final result. However, this technique does not provide for the effective use with the presence of hard tissue lesions of teeth, prominent among them being pathological attrition.*

Method: Morphological and radiographic methods of dental age estimation were experimented on 165 patients of Uzhorod National University Dental Clinic with a purpose to compare the results of real and calculated age. The method of Kvaal et al. was selected as the most rational and perspective with the ability to use digital panoramic x-rays photo. 140 digital panoramic x-rays photo were analyzed using Photodontics, Adobe Photoshop CS3 software. Math analysis was made by using MS Excel 2003, Statistics Pro. The comparison of real age and determined age was made. Based on randomized selection of panoramic x-rays photo of patients with pathological attrition of teeth were selected 88 of them. Accounting changes in pulp and hard tissues during pathological attrition we tried to find new improved coefficient in formulas of Kvaal with a purpose to make result more relative to real age. Also the coefficient of Pearson was calculated with purpose to find relation between the end result of age and different factors during pathological attrition, such as level of attrition of the tooth surface, the deposition of dentine, degenerative changes of the pulp.

Results and conclusions: Individually calculated improved coefficients for Kvaal et al. age estimation technique during pathological attrition made the result more relative to real age. Age estimation technique can be improved accounting morphological changes during pathological attrition and new calculated coefficients make possibility to expand the circle of persons age of which need to be found.

KEYWORDS: Forensic Odontology, Age determination, Pathological attrition.