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CORRELATIONS OF TELERADIOMETRIC PARAMETERS ACCORDING TO THE STEINER METHOD WITH TOOTH SIZES IN UKRAINIAN YOUNG WOMEN WITH PHYSIOLOGICAL OCCLUSION AND A VERY WIDE FACIAL TYPE

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Introductions. Orthodontic pathologies, in particular dento-maxillary anomalies, are among the most common diseases among children and adolescents and have a significant impact on both aesthetics and functionality of the dento-maxillary system. The prevalence of different types of anomalies varies depending on the population, age and diagnostic criteria. Thus, according to the study by G. Laganà et al., among 4700 non-orthodontic patients, the most common were anomalies of tooth position (6.1%), agenesis (5.3%) and retention (2.1%) [4, pp. 3-4]. Similar results were obtained in the study by N. H. Bilge et al., where out of 2025 patients, 24.4% had at least one anomaly of dental development, the most common of which was hypodontia (7.7%), followed by retention (5.5%) and microdontia (2.6%) [2, pp. 325].

In the study by M. Al-Abdallah et al. it was noted that tooth agenesis was observed in 5.46% of the examined, while it was much more common in the upper jaw compared to the lower (63% vs. 37%) [1, p. 795]. Fekonja A. in his study among children found that the most common anomalies were retention (5.7%), hypodontia (3.9%) and tremors (3.3%). At the same time, the author emphasizes the negative impact of these changes on the aesthetics and psycho-emotional state of children [3, p. 278].

Thus, the frequency of detection of orthodontic pathologies is high, and the spectrum of anomalies is quite wide, which confirms the relevance of early diagnosis and planning of orthodontic treatment.

Aim. Establishing the features of correlations between teleradiometric indicators according to the Steiner method and tooth sizes in Ukrainian young women (YW) with physiological occlusion and a very wide facial type.

Materials and methods. Primary computed tomograms of 30 Ukrainian YW (aged 16 to 20 years) with physiological occlusion with a very wide face type according to Garson, obtained from the data bank of the Department of Pediatric Dentistry and the Research Center of the National Pirogov Memorial Medical University, Vinnytsya. All teleradiographic and computed tomographic studies were performed using a dental cone-beam tomograph Veraviewepocs 3D Morita (Japan) and Planmeca ProMax 3D Mid, manufactured by Planmeca OY (Finland) and were conducted based on the principle of voluntary informed consent in the private dental clinic “Vinintermed” and in the “Planmeca 3D Maxillofacial Diagnostics Center”. The Bioethics Committee of the National Pirogov Memorial Medical University, Vinnytsya (protocol No. 7 dated 11/8/2022) established that the conducted research does not contradict the basic bioethical norms of the Declaration of Helsinki, the Council of Europe Convention on Human Rights and Biomedicine (1977), relevant WHO provisions, and the laws of Ukraine.

Morphometric studies of teeth were performed using the software applications i-Dixel One Volume Viewer (Ver.1.5.0) J Morita Mfg. Cor, and Planmeca Romexis Viewer (ver. 3.8.3.R 15.12.14) Planmeca OY [5, p. 30-32]. To determine the morphometric characteristics of teleradiograms, measurements were performed in the OnyxCeph³™ application, version 3DPro, Image Instruments GmbH, Germany. Analysis of lateral teleradiograms was performed according to the method of Steiner [6, p. 10-22].

Correlations were assessed in the licensed package "Statistica 6.0" using Spearman's nonparametric statistics.

Results and discussion. As a result of the analysis of reliable and medium-strength unreliable relationships between teleradiometric indicators according to the Steiner method with the sizes of the teeth of the upper jaw in YW with a very wide facial type, the following multiple correlations were found:

medium-strength reliable and unreliable, mainly inverse ($r =$ from -0.33 to -0.45), and direct ($r =$ from 0.32 to 0.39) correlations between the magnitude of the II angle and the length of the root part of the central incisors and canines, the width of the cervical part of the central incisors in the mesio-distal plane, the length of the coronal part of the central incisors in the vestibulo-oral plane, the length of the central incisors (reverse), the width and length of the coronal part of the canines in the mesio-distal plane, the width of the coronal part of the central incisors in the vestibulo-oral plane (straight); medium-strength reliable and unreliable, mostly inverse ($r =$ from -0.31 to -0.57), and direct ($r =$ from 0.34 to 0.53) correlations between the S-OcP angle and the length of the crown part of the lateral incisors and canines in the mesio-distal plane, the length of the root part of the central incisors and canines in the vestibulo-oral plane, the length of the canines (inverse), the length of the crown part of the central and lateral incisors in the vestibulo-oral plane, the length of the root part of the lateral incisors in the mesio-distal plane (straight); mainly inverse, medium-strength, reliable and unreliable ($r =$ from -0.30 to -0.62), correlations between the size of the SN-GoGn angle and the length of the root part of the central and lateral incisors, canines in the vestibulo-oral plane, the length of the root part of the canines in the mesio-distal plane and the length of the canines; mostly reliable direct ($r =$ from 0.41 to 0.44) and inverse ($r =$ -0.32 and -0.41) correlations between the value of the Mand1-NB angle and the length of the root part of the central incisors and canines in the mesio-distal plane, the length of the coronal part of the central incisors in the vestibulo-oral plane and the length of the central incisors (direct), the width of the cervical part of the lateral incisors in the vestibulo-oral plane and the length of the coronal part of the canines in the mesio-distal plane (inverse). Quantitative analysis of reliable and medium-strength unreliable correlations between teleradiometric indicators according to the Steiner method with the sizes of the upper jaw teeth in girls with a very wide face type revealed 59 relationships out of 560 possible (10.54%), of which 3.57% were reliable direct relationships of medium strength, 2.86% were unreliable direct relationships of medium strength, 0.18% were reliable inverse relationships of strong strength, 1.96% were reliable inverse

relationships of medium strength, and 1.96% were unreliable inverse relationships of medium strength.

When analyzing reliable and medium-strength unreliable correlations between teleradiometric indicators according to the Steiner method with the sizes of the lower jaw teeth in YW with a very wide facial type, the following multiple correlations were found: medium-strength straight lines, mostly unreliable (r = from 0.30 to 0.40), correlations between the size of the SNB angle and the width of the coronal part of the central incisors, canines and first premolars, the length of the coronal part of the central incisors and canines in the mesiodistal plane, the width of the cervical part of the lateral incisors in the vestibulo-oral plane; direct correlations of medium strength are reliable and unreliable (r = from 0.31 to 0.43) between the size of the SND angle and the width of the coronal part of the central incisors, canines and first premolars, the length of the coronal part of the central incisors in the mesio-distal plane, the width of the cervical part of the central, lateral incisors and canines, the width of the coronal part of the lateral incisors and canines in the vestibulo-oral plane; medium strength, mostly reliable, inverse (r = from -0.33 to -0.49) and direct (r = from 0.36 to 0.53) correlations between the magnitude of angle II and the width of the cervical part of the central and lateral incisors, the length of the root part of the central incisors in the mesio-distal plane, the length of the first premolars (inverse), the length of the coronal part of the central and lateral incisors in the mesio-distal plane, the width of the coronal part of the canines in the vestibulo-oral plane (direct); medium-strength reliable and unreliable direct (r = from 0.30 to 0.43) and inverse (r =from -0.30 to -0.52) correlations between the SN-OcP angle and the width of the cervical part of the central and lateral incisors, the length of the root part of the lateral incisors in the mesio-distal plane, the length of the coronal part of the lateral incisors and canines in the vestibulo-oral plane (direct), the length of the coronal part of the central, lateral incisors and canines, the width of the coronal part of the canines in the mesio-distal plane, the length of the root part of the central incisors and canines in the vestibulo-oral plane (inverse); mainly medium-strength reliable direct (r = from 0.34 to 0.63) and inverse (r = -0.41 and -0.62) correlations between the Mand1-NB angle

and the width of the cervical part of the central and lateral incisors, the length of the root part of the central and lateral incisors in the mesio-distal plane, the length of the first premolars (direct), the length of the coronal part of the central and lateral incisors in the mesio-distal plane (inverse); reliable medium-strength, mainly direct ($r =$ from 0.38 to 0.46) and inverse ($r = -0.36$ and -0.51) correlations between the value of the 11-NB distance and the width of the cervical part of the central and lateral incisors, the length of the root part of the central incisors in the mesio-distal plane, the length of the first premolars (direct), the length of the coronal part of the central and lateral incisors in the mesio-distal plane (inverse); direct correlations of medium strength are reliable and unreliable ($r =$ from 0.31 to 0.52) between the value of the S-L distance and the width of the coronal part of the canines and first premolars in the mesio-distal plane, the width of the coronal part of the canines, premolars and second premolars, the width of the cervical part of the lateral incisors and canines, the length of the root part of the canines in the vestibulo-oral plane, the length of the canines and first premolars. Quantitative analysis of reliable and medium-strength unreliable correlations between telerradiometric indicators according to the Steiner method with the sizes of the lower jaw teeth in girls with a very wide face type revealed 83 relationships out of 560 possible (14.82%), of which 0.18% were reliable direct strong, 5.18% were reliable direct medium-strength, 5.00% were unreliable direct medium-strength, 0.36% were reliable inverse strong, 2.68% were reliable inverse medium-strength, and 1.43% were unreliable inverse medium-strength.

The data obtained indicates the presence of a close relationship between facial morphometric parameters, dentoalveolar structure, and cephalometric indices, which has practical significance for individualizing the orthodontic approach.

Conclusions. In Ukrainian YWs with physiological occlusion and a very wide facial type, multiple reliable and unreliable correlations of medium strength ($r =$ from 0.30 to 0.54 – 6.43% of the total number of relationships), mostly direct, were established between telerradiometric indicators according to the Steiner method with the sizes of incisors, canines and first premolars of the upper jaw, and multiple reliable and unreliable correlations, mostly direct correlations of medium strength

($r =$ from 0.30 to 0.63 – 10.36% of the total number of relationships), with incisors, canines and first premolars of the lower jaw.

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