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CORRELATIONS OF TELERONTHENOMETRIC INDICATORS USING THE TWEED METHOD WITH TEETH SIZES IN UKRAINIAN GIRLS WITH PHYSIOLOGICAL BITE AND VERY WIDE FACIAL TYPE

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Introductions. The desire to have a beautiful smile is one of the needs of the population, which is steadily growing. Quite often, the key to creating the so-called "Hollywood" smile is not only the whiteness of the teeth and the presence of a complete dentition, but also the harmony of the smile in accordance with the face.

The cause of such harmony is often orthodontic pathologies, the frequency of detection of which in the teenage age group is steadily increasing. Analysis of the spread of pathology of the location of the lower third molar, revealed that the average age of the onset of detection of this pathology is 14.92 years, the final – 21.87 years [1, p. 1-3].

In addition to the aesthetic problem caused by orthodontic pathologies, they are also functional. Thus, the analysis of the indicators of 102 people with class III occlusion pathology and 62 healthy people (control group) revealed distortion of consonant articulation in the former. Regression analysis showed that the degree of disharmonious jaw position correlates with the degree of distortion of the pronunciation of the letters "t" and "k" [2, p. 340-348].

Aim. Establishing the features of correlations between teleradiometric indicators according to the Tweed method with the sizes of the teeth of the upper and lower jaws in Ukrainian girls with a physiological bite and a very wide facial type.

Materials and methods. Computed tomograms of 30 Ukrainian girls 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 tomography 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”.

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 Tweed C. H. [6, p. 124-161, 5, p. 31-32].

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 Tweed method with the sizes of the teeth of the upper jaw in girls with a very wide face type, the following multiple correlations were found: medium-strength reliable and unreliable inverse ($r =$ from -0.30 to -0.40) and direct ($r =$ from 0.31 to 0.39) correlations between the magnitude of the FMIA 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, the length of the central incisors (inverse), the width and length of the coronal part of the canines in the mesio-distal plane, the width of the cervical part of the lateral incisors in the vestibulo-oral plane (direct); medium-strength reliable inverse ($r =$ from -0.40 to -0.54) correlations between the magnitude of the FMA angle and the length of the root part of the central canines in the mesio-distal and vestibulo-oral plane, the width of the coronal part of the first molars in the mesio-distal plane, and the length of the canines; medium strength, mostly reliable direct ($r =$ from 0.30 to 0.55), and inverse ($r =$ -0.38 and -0.46) correlations between the value of the IMPA 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, the length of the central incisors and canines (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); medium-strength reliable and unreliable straight lines ($r =$ from 0.31 to 0.44) correlations between the magnitude of the SNA_T angle and the width of the coronal part of the first premolars in the mesio-distal plane of the second premolars in the vestibulo-oral plane, the length of the canines and second premolars; medium-strength reliable and unreliable inverse ($r =$ from -0.30 to -0.45) and unreliable direct ($r =$ from 0.30 to 0.36) correlations between the POr_OcP angle and the length of the root part of the central incisors and canines in the vestibulo-oral plane, the length of the coronal part of the canines in the mesio-distal plane (inverse), the length of the coronal part of the central and lateral incisors of the canines in the vestibulo-oral plane, the width of the cervical part of the lateral incisors in the mesio-distal plane (direct); medium-strength reliable and unreliable inverse ($r =$ from -0.33 to -0.57) correlations between the value of the PFH distance and the width of the coronal part of the lateral incisors, the length of the coronal part of the canines in the mesio-distal plane, the width of the cervical part of the central incisors, the width of the coronal part of the first molars in the vestibulo-oral plane, the length of the second premolars.

Quantitative analysis of reliable and medium-strength unreliable correlations between teleradiometric indicators according to the Tweed method with the sizes of the upper jaw teeth in girls with a very wide face type revealed 48 relationships out of 490 possible (9.80 %), of which 2.45 % were reliable direct relationships of medium strength, 2.65 % were unreliable direct relationships of medium strength, 3.06 % were reliable inverse relationships of medium strength, and 1.63 % were unreliable inverse relationships of medium strength.

When analyzing the reliable and medium-strength unreliable relationships between teleradiometric indicators according to the Tweed method with the sizes of the lower jaw teeth in girls with a very wide face type, the following multiple

correlations were found: medium-strength, mostly reliable, direct ($r=$ from 0.31 to 0.59) and inverse ($r=$ -0.48 and -0.56) correlations between the magnitude of the FMIA angle and 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), the length of the root part of the central incisors in the mesio-distal plane, the length of the first premolars (inverse); medium-strength reliable and unreliable direct ($r=$ from 0.34 to 0.57) and inverse ($r=$ from -0.31 to -0.57) correlations between the IMPA angle and the length of the root part of the central and lateral incisors, the width of the cervical part of the 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, the width of the coronal part of the canines in the vestibulo-oral plane (inverse); medium-strength reliable and unreliable straight lines ($r=$ from 0.31 to 0.44) correlations between the magnitude of the SNA_T and SNB_T angles and the width of the coronal and cervical parts of the lateral incisors in the vestibulo-oral plane, the width of the coronal part of the canines and first premolars, the length of the coronal part of the canines in the mesio-distal plane, as well as only with the magnitude of the SNB_T angle and the width and length of the coronal part of the central incisors in the mesio-distal plane; mainly of medium strength, reliable and unreliable direct ($r=$ from 0.32 to 0.51) and inverse ($r=$ -0.40 and -0.61) correlations between the value of the ANB_T angle and the length of the root part of the central and lateral incisors in the mesio-distal plane, the width of the coronal part of the first premolars in the vestibulo-oral plane (direct), the length of the coronal part of the central and lateral incisors in the mesio-distal plane (inverse); medium-strength reliable and unreliable, mainly inverse ($r=$ from -0.33 to -0.52), and direct ($r=$ from 0.34 to 0.41) correlations between the magnitude of the POr_OcP angle and the length of the coronal part of the central 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, lateral incisors and canines in the vestibulo-oral plane (inverse), the width of the cervical part of the central incisors in the mesio-distal plane, the length of the coronal part of the lateral incisors and canines in the

vestibulo-oral plane (direct).

Quantitative analysis of reliable and medium-strength unreliable correlations between teleradiometric indicators according to the Tweed method with the sizes of the lower jaw teeth in girls with a very wide face type revealed 58 relationships out of 490 possible (11.84 %), of which 2.65 % were reliable direct relationships of medium strength, 3.06 % were unreliable direct relationships of medium strength, 0.20 % were reliable inverse relationships of strong strength, 2.04 % were reliable inverse relationships of medium strength, and 3.88 % were unreliable inverse relationships of medium strength.

Mahboubi and Azadnia [3, p. 273-275] conducted a study on Iranians to identify the normative sizes of the upper front teeth and their subsequent comparison with standard indicators. Statistical analysis revealed a pronounced asymmetry of the sizes of the canines in men, and manifestations of sexual dimorphism (higher values of the sizes of the left canine in women ($p=0.01$)). Differences in the indicators in the studied population compared to the standard ones were also found, which confirms the influence of the ethnic component on orthodontic parameters.

The presence of a connection between orthodontic indicators and features of facial morphology was also confirmed. In the work of Radia et al. [4, p. 741-745], correlations were established between the total height of the face, the height of the face between the nasion and the chin, and the width and height of the upper incisors. Thus, all the above parameters, namely gender, age, ethnicity, and anthropometric facial features, play an important role in the formation of the dimensional parameters of the teeth.

Conclusions. In Ukrainian girls with a physiological bite and a very wide facial type, multiple reliable and unreliable medium-strength direct ($r=$ from 0.30 to 0.55 – 5.10 % of the total number of relationships) and inverse ($r=$ from -0.30 to -0.57 – 4.69 % of the total number of relationships) correlations of teleradiometric indicators according to the Tweed method (in most cases angular) with the sizes of the central incisors and canines of the upper jaw, and, mainly medium-strength, inverse ($r=$ from -0.30 to -0.61 – 6.12 % of the total number of relationships) and

direct ($r =$ from 0.30 to 0.59 – 5.71 % of the total number of relationships) correlations with the sizes of the central and lateral incisors, canines and first premolars of the lower jaw were established.

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