ОРТОДОНТІЯ

UDC 616-073.75:616.314.26-053.81

Shinkaruk-Dykovytska M. M., Pozur T. P., Koliadenko S. V., Orlovskiy V. O., Galunko G. M.

REGRESSION MODELS OF INDIVIDUAL LINEAR DIMENSIONS NECESSARY FOR CONSTRUCTING THE CORRECT FORM OF DENTAL ARCH IN YOUNG WOMEN WITH A WIDE FACE, DEPENDING ON THE FEATURES OF ODONTOMETRIC AND CEPHALOMETRIC INDICATORS

National Pirogov Memorial Medical University, Vinnytsya, Vinnytsia, Ukraine

Introduction

Historically, dental care is one of the basic medical needs for the population, without which it is now impossible to imagine the settlement. With this in mind, this field of science is changing most rapidly and adapting to the needs of the population, in particular, the principle of modern medicine's orientation to the individual approach to each patient. It also transitioned to providing dental services.

The basis of this field of medicine is the idea that each organism, depending on many factors (gender, age, type of constitution, ethnic and race affiliation, etc.) in its own way responds to different diseases, has a different degree of predisposition and manifestation to them [1].

The same applies to the dental area, but not just diseases. It is about creating models that will help doctors create the perfect smile that is harmonious with the particular face of the patient. Works on this topic are already being carried out both in Ukraine and beyond its boundaries [2-7], and are based on the study of dependence as certain anthropometric indicators with other indicators, which at first glance may have nothing in common [8], and in some way related structures [9-13]. One such promising area is the study of odontometric and cephalometric indicators and their relationship with the shape of the dental arch in individuals of different sex, age and with different types of faces.

The purpose of the study is to build and analyze the regression models of computed tomographic parameters necessary to determine the correct shape of dental arches, depending on the odontological and cephalometric parameters for girls with normal occlusion close to orthognathic occlusion and a wide type of face.

Materials and methods

Within the framework of the scientific subject of the Department of Therapeutic Dentistry of National Pirogov Memorial Medical University, Vinnytsya “Current trends and newest technologies in the diagnosis and treatment of odontopathology, diseases of periodontal tissues and mucous membrane of the oral cavity” (state registration number: 0118U005471) primary computer-demographic indices of tooth sizes were analyzed (obtained by using the Veraviewepocs 3D, Morita dental cone-ray tomograph) and cephalometric parameters of 50 young women with normal occlusion close to orthognathic occlusion (obtained from the data bank of the Research Center of National Pirogov Memorial Medical University, Vinnytsya). Committee on Bioethics National Pirogov Memorial Medical University, Vinnytsya (protocol № 3 of March 16, 2017) found that the studies carried out comply with the bioethical and moral requirements of the Declaration of Helsinki, the Council of Europe Convention on Human Rights and Biomedicine (1977), the relevant provisions of WHO and the laws of Ukraine.

According to the scheme developed by Gunas I.V., Dmitriev N.A. and Marchenko A.V. [14], in the i-Dixel One Volume Viewer [Ver.1.5.0] J Morita Mfg. Cor, the linear dimensions of the central and lateral incisors, canines, first and second premolars, and the first molars of the upper and lower jaws were determined. Namely, measurements (mm) were performed: the width of the crowns of the teeth (VSHIR) and the width of the teeth at the level of the anatomic neck (MDDEG) in the mesio-distal direction; tooth crown widths (TSHIR), the width of the teeth at the level of the anatomical neck (VDEG), the distance from the anatomical neck to the apex of the root (VLROOT), and the distance from the middle of the cutting edge to the apex of the root (L) in the vestibulo-oral direction; as well as the root length of the incisors and canines (ALROOT) in the mesio-distal direction.

Since in previous studies [14] no differences were found when comparing the sizes of the same teeth of the right and left sides on both the upper and lower jaws, in subsequent studies the average values of the corresponding teeth are used: upper or lower central incisors (respectively 11 or 41) ; upper or lower lateral incisors (12 or 42, respectively); upper or lower canines (13 or 43, respectively); upper or lower first premolars (14 or 44, respectively); upper or lower second premolars (respectively 15 or 45); upper or lower first molars (16 or 46 respectively).

Cephalometry was performed using a soft centimeter ribbon and Martin's compass [15]. The following dimensions (mm) were measured: AL_AL – width of the base of the nose (distance between the alar points); AU_AU – ear diameter (biauricular width); AU_GL – distance from the auricular point to the glabella (averaged); AU_GN – distance from auricular point to chin (average); AU_GO – distance from the auricular point to the angle of the mandible (average); AU_N – distance from the auricular point to the nasion (averaged); AU_SN – distance from auricular point to subnasion (averaged); AU-I – distance from the auricular point to the inter-cutter point (averaged); CHI_CHI – width of the mouth slit; DUG_AU_AU – transverse arc measured by a ribbon from the right tragus point to the left; DUGS_G_OP – sagittal arch measured by a ribbon from a glabella to the occipital point; DUG_G_OP – the largest girth of the head due to the glabella and inion; EK_EK – biorbital width (direct size between the outer corners of the eye slits); EU_EU – maximum head width (occipital diameter); FMT_FMT – smallest width of head (frontal diameter); G_OP – the greatest length of the head, is the distance from the glabella to the opisthocranion; GO_GN – mandibular body length (average); GO_GO – width of mandible (width between corners of mandible); LS_LI – height of red lip border; MF_MF – anterior inter-orbital width (straight distance between the inner corners of the eye pits); N_GN – morphological length of the face (direct distance from the nasion to the gnathion); N_I – distance between the nasion and the inter-cutter point; N_PR – distance between nasion and prosthion; N_PRN – length of nose (distance between nasion and pronasion); N_SN – the height of the nose (distance between the supra-nasal and sub-nasal points); N_STO – the height of the upper part of the face (distance from the nasal to the oral points); SN_PRN – depth of nose (distance between subnasion point and pronasion); SN_STO – height of upper lip (distance from sub-nose point to stomion); STO_GN – height of lower part of face (distance from mouth to chin point); STO_SPM – height of lower lip (distance from stomion to supramental); TR_GN – physiological length of face (distance from trichion to gnathion); TR_N – forehead height (straight distance between the trichion points (hairline) and nasion; V_GOL – projection distance from vertex to the upper edge of the auditory aperture; ZM_ZM – average width of the face (distance between zygomaxillary points); ZY_ZY – width of the face (the distance between the zygomatic points).

Face type was determined using the Garson morphological index – the ratio of the morphological length of the face (the direct distance from the nasion to the gnathion) to the width of the face in the area of the zygomatic arches [16]. Among 50 young women with normal occlusion close to orthognathic occlusion, it was determined: with a very wide face – 21, with a wide face – 20, with a middle face – 6, with a narrow face – 3, with a very narrow face – 0.

In the "Statistica 6.0" license package, we have, through direct stepwise regression analysis, built models of the linear dimensions necessary to construct the correct shape of dental arches, depending on odontometric and cephalometric parameters.

Results

In young women with a wide face type, the regression models of the size required to construct the correct form of dental arches, depending on the odontometric and cephalometric parameters, have the following linear equations:

NAPX_6 = 94,58 + 0,871 × CHI_CHI – 10,35 × MDDEG_43 – 1,745 × MDDEG_12 – 1,676 × ALROOT_41 – 2,805 × VSHIR_13 – 0,234 × TR_N + 0,492 × STO_SPM (R^2=0,895; $F_{(7,12)}$=14,55; p<0,001);

DAPX_6 = –138,5 + 1,558 × AU_I + 0,129 × DUGS_G_OP – 0,545 × TR_GN + 0,920 × STO_SPM + 0,835 × ALROOT_41 + 0,701 × AL_AL + 1,901 × VSHIR_15 (R^2=0,922; $F_{(7,12)}$=20,28; p<0,001);

MAPX_6 = 12,32 + 0,396 × AU_GO + 1,027 × LS_LI + 0,943 × L_11 – 1,143 × VLROOT_41 – 0,192 × N_SN (R^2=0,933; $F_{(5,14)}$=39,13; p<0,001);

MAPX_46 = 42,78 + 2,666 × VSHIR_11 – 0,524 × SN_PRN (R^2=0,620; $F_{(2,16)}$=13,04; p<0,001);

DAPX_46 = 11,56 + 6,918 × TSHIR_16 – 3,309 × VSHIR_43 – 1,168 × L_43 + 1,299 × ALROOT_13 – 4,830 × TSHIR_13 + 2,960 × MDDEG_41 + 0,195 × AU_AU (R^2=0,950; $F_{(7,11)}$=29,82; p<0,001);

PONM = 35,49 + 5,268 × VSHIR_42 – 5,388 × MDDEG_43 – 4,339 × VSHIR_44 + 0,331 × AU_I + 1,872 × VDEG_11 – 0,521 × MF_MF (R^2=0,919; $F_{(6,13)}$=24,68; p<0,001);

VESTBUGM = 20,23 + 4,026 × VSHIR_42 – 5,702 × MDDEG_43 – 4,039 × VSHIR_44 + 2,300 × VSHIR_16 + 0,427 × AU_I – 0,395 × LS_LI (R^2=0,948; $F_{(6,13)}$=39,61; p<0,001);

PONPR = 20,08 + 0,354 × AU_I – 6,306 × MDDEG_43 + 3,028 × MDDEG_11 – 0,721 × L_14 + 0,500 × STO_SPM – 0,131 × TR_N (R^2=0,894; $F_{(6,13)}$=18,25; p<0,001);

BUGR13_23 = 5,143 + 1,815 × VSHIR_11 + 0,411 × SN_STO + 0,253 × L_11 – 0,290 ×

STO_SPM + 0,881 × TSHIR_12 (R^2=0,949; $F_{(5,14)}$=52,31; p<0,001);

APX13_23 = –62,34 + 3,297 × VSHIR_12 + 0,577 × ZY_ZY + 0,741 × L_45 – 0,477 × AL_AL – 0,645 × ALROOT_42 (R^2=0,973; $F_{(5,14)}$=50,17; p<0,001);

BUGR33_43 = –27,30 + 1,826 × VSHIR_16 + 0,256 × GO_GO + 0,396 × STO_SPM (R^2=0,737; $F_{(3,16)}$=14,95; p<0,001);

APX33_43 = –37,93 + 7,469 × MDDEG_43 + 1,558 × ALROOT_41 + 5,520 × TSHIR_12 – 0,780 × VLROOT_41 – 1,229 × MDDEG_11 – 0,101 × AU_SN (R^2=0,917; $F_{(6,13)}$=23,79; p<0,001);

DL_C = –2,561 + 3,154 × TSHIR_42 + 1,548 × VSHIR_43 – 3,736 × VDEG_42 + 0,312 × VLROOT_11 + 0,873 × TSHIR_16 – 0,106 × GO_GN (R^2=0,926; $F_{(6,13)}$=27,09; p<0,001);

DL_F = –11,39 + 2,154 × VSHIR_42 + 2,271 × MDDEG_43 + 0,330 × VLROOT_41 + 0,628 × VSHIR_16 + 1,036 × VSHIR_44 – 0,095 × AU_GL (R^2=0,921; $F_{(6,13)}$=25,54; p<0,001);

DL_S = 9,857 + 3,565 × VSHIR_42 + 0,864 × MDDEG_41 – 0,172 × GO_GN + 1,911 × MDDEG_43 + 0,239 × L_12 (R^2=0,945; $F_{(5,14)}$=47,46; p<0,001);

GL_1 = –29,24 + 2,315 × VSHIR_11 + 0,719 × ALROOT_41 + 1,510 × VSHIR_41 + 0,817 × VLROOT_41 – 0,294 × L_15 + 0,342 × VLROOT_13 – 0,481 × VLROOT_42 (R^2=0,930; $F_{(7,12)}$=22,84; p<0,001);

GL_2 = –12,33 + 0,273 × ALROOT_13 + 7,792 × VDEG_12 – 6,533 × TSHIR_43 + 5,999 × TSHIR_13 – 0,255 × AU_SN – 3,264 × MDDEG_43 + 0,301 × ZY_ZY – 1,979 × VSHIR_44 (R^2=0,948; $F_{(8,11)}$=25,23; p<0,001);

GL_3 = –5,168 + 1,327 × L_14 + 0,416 × EU_EU – 0,308 × G_OP + 2,436 × VSHIR_41 – 3,333 × MDDEG_13 + 0,744 × ALROOT_42 – 0,901 × ALROOT_11 (R^2=0,922; $F_{(7,12)}$=20,30; p<0,001).

where: APX13_23 – distance between the apexes of the roots of the upper canines (mm); APX33_43 – distance between the apexes of the roots of the lower canines (mm); BUGR13_23 – distance between tubercles of upper canines (mm); BUGR33_43 – distance between lower tusks (mm); DAPX_16 – distance between the apexes of the distal buccal roots of the upper first molars (mm); DAPX_46 – distance between the apexes of the distal roots of the lower first molars (mm); DL_C – canine sagittal distance of maxillary dental arch (mm); DL_F – premolar sagittal distance of maxillary dental arch (mm); DL_S – molar sagittal distance of the maxillary dental arch (mm); $F_{(!!)}$=!! – critical $_{(!,\ !!)}$ and Fisher criterion value (!!, !!) obtained; GL_1 – depth of palate at canine level (mm); GL_2 – depth of the palate at the level of the first premolars (mm); GL_3 – depth of the palate at the level of the first molars (mm); MAPX_16 – distance between the apexes of the medial buccal (vestibular) roots of the upper first molars (mm); MAPX_46 – distance between the apexes of the medial roots of the lower first molars (mm); NAPX_16 – distance between the apexes of the palatine roots of the upper first molars (mm); PONM – distance between Pon molar points (mm); PONPR – distance between premolar points according to Pon (mm); R^2 – coefficient of determination; VESTBUGM – distance between the vestibular median tubercles of the upper first molars (mm).

Discussion

Thus, for young women with a wide face type of 18 possible CT sizes used to construct the correct dental arch shape, all 18 reliable models are constructed, depending on the features of odontometric and cephalometric indicators with a coefficient of determination from 0,620 to 0,973. In our previous studies [17] in young women with a very wide face type also constructed all 18 possible valid models, with coefficients of determination from 0,863 to 0,962.

The analysis of our results showed that in young women with a wide face type models more often include odontometric (67,3 %, of which 15,4 % belong to the upper incisors; 20,2 % – to the lower incisors; 6,7 % – on the upper canines; 11,5 % – on the lower canines; 3,8 % – on the upper premolars; 4,8 % – on the lower premolars; 4,8 % – on the upper molars) than the cephalometric ones (32,7 %) indexes. Among the odontometric indicators, the most commonly included to models are: the width of the crowns of the teeth in the mesio-distal direction (20,2 %, of which 11,5 % on the lower jaw); width of the teeth at the level of the anatomical neck in the mesio-distal direction (13,5 %, of which 9,6 % on the mandible); root length of incisors and canines in the mesio-distal direction (8,7 %, of which 5,8 % on the mandible). Among the cephalometric indicators, the models most common included: height of the lower lip (4,8 %); distance from the auricular point to the inter-incisors point (3,8 %); width of face, width of base of nose, height of forehead, height of red border of lips, length of body of mandible and distance from auricular point to subnasion (1,9 % each).

In our previous studies, it was found [17] that built models in young women with a very wide face type also more often include odontometric (73,0 %) than the cephalometric indicators (27,0 %). However, in young women with very wide faces, the width of the crowns of the teeth and the width of the teeth at the level of the anatomic neck in the mesio-distal direction (20,7 % and 14,4 %) and the width of the crowns of the teeth in the vestibulo-oral direction (10,8 %). Among cephalometric indicators in young women with very wide faces most often models include the greatest length of head (3,6 %), average width of face and height of lower lip (2,7 % each).

Bisht M. et al [18] set out to identify the relationship between a person's face type and dental arch shape and the palate pattern in a survey of 250 Moradabad residents, 18-25 years old. The results of the analysis of the obtained data did not reveal the dependence of the image of the palate with other indicators ($p>0.05$), but significant correlations between the type of face and the shape of the dental arch ($p<0.001$) were found.

Farooq A. et al. [19] found a relationship between the width of the dental arch and the vertical facial morphology in the analysis of 100 lateral cephalometric images and dental imprints. Thus, when comparing the inter-canine width and the SN-MP angle, the differences for all results were statistically significant ($p<0.05$).

In another study, the SN-MP angle was also used to find a correlation between dental arch shape and vertical facial morphology. 73 individuals with skeletal class occlusion II were selected for the study. Statistical analysis of the data revealed a decrease in the transverse diameters of the upper arch in patients with high SN-MP angle and an increase in patients with low SN-MP angle ($p<0.05$) [20].

Khera A. K. et al [21] investigated 90 lateral cephalograms of 45 women and 45 men aged 17-24 years to determine the ratio of Jarabak, maxillary and mandibular cumulative mesiodistal, inter-incisive widths, arch perimeter, arch length, first inter-premolar, and first inter-molar, palate widths. Statistical analysis revealed that in both men and women, as the size of the vertical face size increased, most odontometric values decreased, except for the height of the palate, whose magnitude increased.

Parameshwaran V. N. [22] conducted studies to determine the interdependence of face type, dental arch width and chewing activity. The survey was conducted on a sample of 40 people – 20 men and 20 women (ages 18-23). According to the molar ratio, the subjects were divided into grades I and II. The width of the dental arch was measured, the shape of the face was investigated with the help of lateral cephalograms and ultrasound to determine the muscle mass of the chewing muscles. The results of the statistical analysis of the obtained data allowed to reveal manifestations of sexual dimorphism – in men of class II compared with women of group I class there were higher indicators of muscle mass. In addition, the thickness of the muscle mass had a negative linear correlation with the height of the jaw ramus, the sum of the angles and the mandibular ratio ($r= -0.70$) and a positive linear correlation with the length of the middle part of the face, the length of the body of the mandible and the width of the maxillary arch ($r= 0.50$).

Pakistani scientists, when analyzing the data obtained in the study of 150 lateral cephalograms revealed a correlation between the angles of SNA and SNB and the inter-incisive width. A weak negative correlation of UICW with SNB ($r= -0.21$) and SNA ($r= -0.25$) angles was detected; weak positive correlation of LICW with SNA ($r= 0.26$) and SNB angle ($r= 0.29$) was detected [23].

Traconis L. B. P. et al. [24] found a statistically significant relationship between face type and dental arch shape for the Yucatan population.

Thus, studies on the impact of face type on future dental arch parameters should take into account ethnic, age, and gender characteristics of the population.

Conclusions. In young women with normal occlusion close to orthognathic bite with a wide type of face, all 18 possible reliable regression models (with a coefficient of determination from 0.620 to 0.973) of the reproduction of individual computed tomographic characteristics of the dental arch of the upper dental arches depending on odonto- and cephalometric parameters were developed and analyzed.

Perspectives for further research. In the future, it is necessary to carry out similar studies in other regions of Ukraine, as well as to verify the correctness of the work we received models from representatives with orthodontic pathology.

References

1. Gunas I, Majewski O, Makarchuk I. Features of somatotype and body weight component composition in patients with acne: boys and girls of Podillya region of Ukraine. Current Issues in Pharmacy and Medical Sciences. 2016 Jun 1;29(2):97-100.
2. Cerruto C, Ugolini A, Di Vece L, Doldo T, Caprioglio A, Silvestrini-Biavati A. Cephalometric and dental arch changes to Haas-type rapid maxillary expander anchored to deciduous vs permanent molars: a multicenter, randomized controlled trial. Journal of Orofacial Orthopedics/Fortschritte der Kieferorthopädie. 2017 Sep 1;78(5):385-93.
3. Dmitriev MO, Gunas IV, Dzevulska IV, Glushak AA. Determination of individual teleroentgenographic characteristics of the lower medial incisors position in Ukrainian young men and young women with orthognathic bite. Reports of Morphology. 2018 Sep 27;24(3):19-25.
4. Gunas I, Shinkaruk-Dykovytska MM, Kotsyura OO, Orlovskiy VO, Dmytrenko SV, Shayuk AV, Glushak AA. Differences of craniotype distribution and types of face among apparently healthy men from different regions of Ukraine. Folia morphologica. 2017;76(3):473-7.
5. Gunas IV, Dmitriev MO, Prokopenko SV, Shinkaruk-Dykovytska MM, Yeroshenko GA. Definition regulatory cephalometric options by the method of Tweed international foundation for Ukrainian boys and girls. World of Medicine and Biology, 2017;13(4):27-31.
6. Jain AR. Comparison of facial form and tooth form between South Indian and Malaysian edentulous patients. Drug Invention Today. 2018 Jun 1;10(6): 874-9.
7. Marchenko AV, Petrushanko TO, Gunas IV. Modeling by regression analysis of the transversal dimensions of the upper and lower jaw and sagittal characteristics of the dental arch in young men, depending on the features of odontometric and cephalometric parameters. Reports of Morphology, 2017;23(1):107-11.
8. Moroz VM, Gunas IV, Serheta IV. Dermatoglyphical and psychophisiological features in practically healthy adolescents of Podilya Region of Ukraine. Bulletin of Siberian Medicine, 2008;7(1):37-45.
9. Dmitriev MO, Gunas IV, Dzevulska IV, Zhulkevych IV. Determination of individual cephalometric characteristics of the occlusal plane in Ukrainian

young men and young women with orthognatic bite. Biomedical and Biosocial Anthropology. 2018 Dec 27;(33):5-11.
10. Glushak AA, Gunas IV. Models of individual linear sizes necessary for the construction of the correct form of dental arch in boys and girls with different heads. Ukrainian Scientific and Medical Youth Journal, 2015;(1):34-8.
11. Gunas I, Glushak A, Samoylenko A. Transversal characteristics of dental arch in boys and girls with orthognathic bite depending on the shape of the head and face type. Curr. Issues Pharm. Med. Sci. 2015;28(1):44-7.
12. Marchenko AV, Gunas IV, Petrushanko TO, Serebrennikova OA, Trofimenko YY. Computer-tomographic characteristics of root length incisors and canines of the upper and lower jaws in boys and girls with different craniotypes and physiological bite. Wiadomosci lekarskie (Warsaw, Poland: 1960). 2017;70(3 pt 1):499-502.
13. Peanchitlertkajorn S, Mercado A, Daskalogiannakis J, Hathaway R, Russell K, Semb G, Shaw W, Lamichane M, Fessler J, Long Jr RE. An intercenter comparison of dental arch relationships and craniofacial form including a center using nasoalveolar molding. The Cleft Palate-Craniofacial Journal. 2018 Jul;55(6):821-9.
14. Gunas IV, Dmitriev NA, Marchenko AV. Methodological aspects of computed tomography odontomorphometry of boys and girls with the physiological bite. Journal of Education, Health and Sport, 2015;5(11):345-55.
15. Bunak V.V. Anthropometry. Practical course: University manual. Uchpedgiz; 1941.
16. Profit RW, Fields HW, Sarver DM. Modern orthodontics. MEDpress-inform; 2006.
17. Pozur TP. Modeling by regression analysis of the transverse dimensions of the upper and lower jaws and sagittal characteristics of the dental arch in young women with a very wide face, depending on the features of the odonto- and cephalometric indicators. Biomedical and Biosocial Anthropology. 2019; 35:29-37.
18. Bisht M, Rawat P, Madan R, Tripathi S. Anthropometricanalysisof palatalrugaepattern, faceform andarchform among Indianpopulationat Moradabad, India. International Dental Journal of Students Research. 2018 Jun;6:13-7.
19. Farooq A, Mahmood A, Jabbar A. Correlation of inter canine width with vertical facial morphology in patients seeking orthodontic treatment. Pakistan Oral & Dental Journal. 2015 Jun 1;35(2): 213-5.
20. Grippaudo C, Oliva B, Greco AL, Sferra S, Deli R. Relationship between vertical facial patterns and dental arch form in class II malocclusion. Progress in orthodontics. 2013 Dec 1;14(1):43.
21. Khera AK, Singh GK, Sharma VP, Singh A. Relationship between dental arch dimensions and vertical facial morphology in class I subjects. Journal of Indian Orthodontic Society. 2012 Dec;46(4_suppl2):316-24.
22. Parameshwaran VN. Masseter Activity, Arch Width and Facial Type. Journal of Indian Orthodontic Society. 2010 Mar;44(1):91-5.
23. Rasool G, Afzal S, Bano S, Afzal F, Shahab A, Shah AM. Correlation of intercanine width with sagittal skeletal pattern in untreated orthodontic patients. Pakistan Orthodontic Journal. 2019 Sep 15;11(1):25-8.
24. Traconis LB, Santana YG, Ruiz GE, Carvajal AM. Correlation of facial profile and dental arches in a population of Yucatan. Revista Mexicana de Ortodoncia. 2016 Apr 1;4(2):e81-4.

Стаття надійшла: 09.04.2020 року

Summary

The purpose of the study: build and analyze the regression models of computed tomographic parameters necessary to determine the correct shape of dental arches, depending on the odontological and cephalometric parameters for girls with normal occlusion close to orthognathic occlusion and a wide type of face. **Materials and methods:** for 20 girls with normal occlusion close to the orthognathic bite and with a wide face type, in the license package "Statistica 6.0" developed regression models of linear sizes necessary for constructing the correct shape of dental arches, depending on odontometric and cephalometric indicators. **Results:** thus, in girls with normal occlusion close to orthognathic occlusion, having a wide type of face, all 18 possible reliable regression models (with a coefficient of determination from 0.620 to 0.973) of the reproduction of individual computed tomographic characteristics of the dental arches of upper and lower dental jaws depending on odonto- and cephalometric parameters were developed and analyzed. **Conclusions:** the results obtained indicate the need to take into account the type of face when calculating the parameters of dental arches.

Key words: young women with normal occlusion close to orthognathic occlusion, wide face type, dental arches, odontometric and cephalometric parameters, regression analysis.

Резюме

Мета дослідження: аналіз і побудова регресійних моделей індивідуальних лінійних розмірів, необхідних для побудови коректної форми зубної дуги в дівчат із широким обличчям залежно від особливостей одонтометричних і кефалометричних показників. **Матеріали й методи:** у 20 дівчат із нормальною оклюзією, наближеною до ортогнатичного прикусу, і з широким типом обличчя, у ліцензійному пакеті “Statistica 6.0” розроблено регресійні моделі лінійних розмірів, необхідних для побудови коректної форми зубних дуг залежно від одонтометричних і кефалометричних показників. **Результати:** для дівчат із нормальною оклюзією, наближеною до ортогнатичного прикусу, які мають широкий тип обличчя, розроблено й проведено аналіз усіх 18 можливих достовірних регресійних моделей (із коефіцієнтом детермінації від 0,620 до 0,973) відтворення індивідуальних комп’ютерно-томографічних характеристик зубних дуг верхньої й нижньої щелеп залежно від одонто- і кефалометричних показників. **Висновки:** отримані результати вказують на необхідність урахування типу обличчя в розрахунках параметрів зубних дуг.

Ключові слова: дівчата з нормальною оклюзією, наближеною до ортогнатичного прикусу; широкий тип обличчя; зубні дуги; одонтометричні й кефалометричні показники; регресійний аналіз.

Резюме

Цель исследования: анализ и построение регрессионных моделей индивидуальных линейных размеров, необходимых для построения корректной формы зубной дуги у девушек с широким лицом в зависимости от особенностей одонтометрических и кефалометрических показателей. **Материалы и методы:** у 20 девушек с нормальной окклюзией, приближенной к ортогнатическому прикусу и с широким типом лица, в лицензионном пакете "Statistica 6.0" разработаны регрессионные модели линейных размеров, необходимых для построения корректной формы зубных дуг в зависимости от одонтометрических и кефалометрических показателей. **Результаты:** для девушек с нормальной окклюзией, приближенной к ортогнатическому прикусу, которые имеют широкий тип лица, разработан и проведен анализ всех 18 возможных достоверных регрессионных моделей (с коэффициентом детерминации от 0,620 до 0,973) воспроизведения индивидуальных компьютерно-томографических характеристик зубных дуг верхней и нижней челюстей в зависимости от одонто- и кефалометрических показателей. **Выводы:** полученные результаты указывают на необходимость учета типа лица в расчетах параметров зубных дуг.

Ключевые слова: девушки с нормальной окклюзией, приближенной к ортогнатическому прикусу; широкий тип лица; зубные дуги; одонтометрические и кефалометрические показатели; регрессионный анализ.