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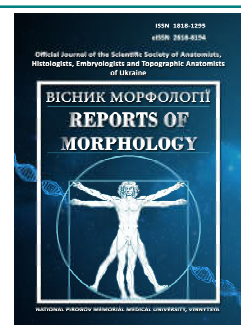
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Features of correlations of the sizes of molars with cephalometric indicators of men of the western region of Ukraine

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ARTICLE INFO

Received: 17 July, 2020

Accepted: 18 August, 2020

UDC: 611.314:616.714.1-071.3:79-055.1(477)

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Expanding the theoretical knowledge of medical anthropology in the modern field of dental services is one of the main drivers of progress in the orthodontic field. The only way to successfully develop the relationship of these disciplines is to create and fill a database of normative data and search for correlations between various, both obviously related and, at first glance, completely unrelated structures of the human body. The purpose of the study was to determine the features of the relationship between the linear dimensions of molars with the cephalometric parameters of practically healthy men of the first mature age, residents of the western region of Ukraine. Cone-beam computed tomography was performed in 36 practically healthy men of the first mature age, residents of the western region of Ukraine (from Rivne, Volyn, Chernivtsi, Lviv, Ternopil, Khmelnytsky, Ivano-Frankivsk and Zakarpattia regions) followed by odontometry research and cephalometry. Statistical processing of the results was performed in the license package "Statistica 6.1" using non-parametric Spearman's statistics. As a result of quantitative analysis of reliable and average strength of unreliable correlations of linear computed tomographic sizes of molars with cephalometric indicators and indices of practically healthy men of the western region of Ukraine it is established that the percentage, mainly direct, reliable and average strength of unreliable correlations of linear sizes of molars with cephalometric indices and with indicators of the cerebral or facial skull is almost no different. The largest number of reliable and medium-strength unreliable correlations of linear molars sizes with cranial indices was found with vestibular-lingual and mesio-distal tooth sizes (20.5% with upper molars and 25.0% with lower molars). The highest number of reliable and medium-strength unreliable correlations of linear molars sizes with facial skull indices was found for upper molars with tooth height, crowns and root length (10.8%) and vestibular-lingual and mesio-distal dimensions (12.8%), and for lower molars - only with vestibular-lingual and mesio-distal dimensions (19.4%). The obtained data testify to the prospects of the chosen scientific direction of research, which will further improve the work of physicians in various fields of medicine, including preventive.

Keywords: computed tomography, molars, odontometry, cephalometry, correlations, practically healthy men, administrative-territorial regions of Ukraine.

Introduction

The human dental apparatus has undergone successive development from a simple organ that provides food grinding to an organ that participates in word-formation function, thus forming speech. Recently, this device has received a new function - aesthetic, thus forming the image of man. All this led to the formation of dentistry as an industry that embraces only the problems of the dental apparatus and in the future, its active branching into other, more specific areas. In particular, one of these branches is

orthodontics - a branch of dentistry that deals with the treatment, study of etiology and prevention of abnormalities of the dental system [6, 13, 15, 16].

However, the last component, namely prevention, is the least studied and possibly underestimated by both representatives of the theoretical and practical direction of orthodontics. The ability to identify population risk groups for a disease using simple and at the same time, scientifically sound methods would seem to be a kind of

"utopia" for medicine. But in fact such works already exist and new ones are being developed - with the use of medical anthropology [3, 7, 17]. The dental industry is no exception, where it is also used to build the ideal proportions of the face and dental system. The latter becomes possible due to the use of various cranial values and their further comparison with human orthodontic indicators [12, 14]. Thus, a group of Indian authors [10] found a positive correlation between the size of the human iris and the mesiodistal width of the central incisor of the upper jaw for men and women.

The difficulty of the widespread implementation of the results of anthropological research is that they require research on different groups of the population - both by age and sex. It is proved that there is a difference in such indicators as length, the ratio of width/length of the teeth of the upper jaw and the width of their crowns, between males and females [27]. It is also necessary to take into account the ethnic and regional affiliation of individuals [9]. It is established that the largest odontometric indicators have representatives of African races, smaller Japanese and the smallest Europeans [4]. Thus, there is a need for research to find relationships between cephalometric and orthodontic indicators that take into account all of the above variables (gender, age, and ethnic or regional affiliation).

The purpose of the study was to determine the features of the relationship between the linear dimensions of molars with the cephalometric parameters of practically healthy men of the first mature age, residents of the western region of Ukraine.

Materials and methods

As a result of the study, 36 practically healthy men of the first mature age, residents of the western region of Ukraine from Rivne, Volyn, Chernivtsi, Lviv, Ternopil, Khmelnytsky, Ivano-Frankivsk and Zakarpattia regions, with favorable, moderately favorable and satisfactory ecological living

conditions were selected. Committee on Bioethics of National Pirogov Memorial Medical University, Vinnytsya found that the research does not contradict the basic bioethical norms of the Council of Europe Convention on Human Rights and Biomedicine (1977) and the Declaration of Helsinki.

Computed tomography was performed using a Veraviewepocs-3D dental cone-beam tomograph (Morita, Japan). Odontometric examination was performed in the software shell i-Dixel One Volume Viewer (Ver.1.5.0, J Morita Mfg. Cor.). Measurements of the first and second molars of the right and left sides of the upper and lower jaws included determination of tooth height and tooth crown, length of palatal medial and distal roots, vestibular-lingual and mesio-distal dimensions of the crown and neck of the tooth [23]. For the convenience of recording, the digital designation of teeth was used: 16 - upper right first molar; 17 - upper right second molar; 26 - upper left first molar; 27 - upper left second molar; 36 - lower left first molar; 37 - lower left second molar; 46 - lower right first molar; 47 - lower right second molar

Cephalometric study of the parameters of the cerebral and facial parts of the head was performed in accordance with generally accepted recommendations and anatomical guidelines and points [2]. The shape of the head [28] and the type of face were also determined [20].

The correlations between odonto- and cephalometric parameters were evaluated in the licensed package "Statistica 6.1" using non-parametric Spearman statistics.

Results

The correlations obtained by us between the sizes of molars of the upper and lower jaws with cephalometric indicators of the brain and facial skull of practically healthy men of the western administrative-territorial region of Ukraine are presented in Tables 1-6.

Table 1. Correlations of the sizes of molars of an upper jaw with cephalometric indicators of a brain skull of a man of the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators						
	DUG_GOP	DUGS_GOP	DUG_AUAU	G_OP	FMT_FMT	EY_EY	KRANIO
17HZ	-0.01	-0.03	0.25	-0.02	0.09	0.00	-0.02
17HKZ	-0.15	-0.09	0.05	-0.18	0.17	0.00	0.11
17HRZ1	-0.06	-0.07	0.22	0.10	-0.06	-0.07	-0.12
17HRZ2	0.19	0.25	<u>0.32</u>	<u>0.32</u>	0.24	0.10	-0.07
17HRZ3	0.03	-0.01	0.13	0.20	-0.05	0.03	-0.18
17VO_K	-0.09	0.03	0.07	-0.08	0.37	0.29	0.25
17VO_S	-0.14	0.15	0.02	-0.09	<u>0.30</u>	0.28	0.29
17MD_K	0.23	0.17	-0.05	<u>0.31</u>	-0.24	-0.21	-0.41
17MD_S	0.27	0.28	0.02	0.36	-0.13	-0.22	-0.43
16HZ	0.13	0.03	<u>0.30</u>	0.01	0.20	0.16	0.11
16HKZ	-0.14	-0.06	0.15	-0.15	0.15	-0.06	-0.02

Continuation of table 1.

Sizes of molars	Cephalometric indicators						
	DUG_GOP	DUGS_GOP	DUG_AUAU	G_OP	FMT_FMT	EY_EY	KRANIO
16HRZ1	0.09	<u>0.33</u>	0.29	0.26	0.14	0.04	-0.14
16HRZ2	0.09	0.02	0.21	0.07	0.06	0.00	-0.03
16HRZ3	0.17	0.22	0.25	<u>0.32</u>	0.14	0.17	-0.08
16VO_S	0.17	0.34	0.14	0.39	0.05	0.02	-0.19
16VO_K	0.04	0.23	0.18	0.13	0.14	0.19	0.08
16MD_S	0.14	0.18	0.06	0.28	-0.06	-0.18	-0.38
16MD_K	0.09	0.09	-0.07	0.22	-0.02	-0.20	<u>-0.33</u>
26HZ	0.16	-0.01	0.24	0.05	0.03	-0.02	-0.06
26HKZ	-0.02	-0.15	0.17	-0.08	0.05	-0.02	0.01
26HRZ1	-0.10	0.04	0.00	0.20	0.08	-0.09	-0.23
26HRZ2	0.09	0.06	0.17	0.10	0.05	-0.03	-0.10
26HRZ3	0.21	0.22	0.22	0.24	0.07	0.09	-0.04
26VO_K	0.21	0.39	<u>0.32</u>	0.33	0.17	0.24	0.01
26VO_S	0.03	0.24	0.19	0.24	0.19	0.15	-0.02
26MD_K	0.09	0.14	0.06	<u>0.31</u>	-0.12	-0.20	-0.41
26MD_S	-0.02	0.05	0.00	0.18	-0.06	-0.21	-0.27
27HZ	-0.14	-0.06	0.17	0.05	-0.11	-0.23	-0.25
27HKZ	-0.33	-0.24	-0.02	-0.19	0.05	-0.03	0.10
27HRZ1	0.02	0.06	<u>0.32</u>	0.25	-0.12	-0.18	-0.29
27HRZ2	0.12	0.16	0.18	0.28	0.08	-0.18	<u>-0.33</u>
27HRZ3	0.03	0.04	0.29	0.11	0.00	0.00	-0.07
27VO_K	-0.25	-0.11	-0.04	-0.02	0.19	0.25	0.23
27VO_S	0.01	0.08	0.08	0.05	<u>0.30</u>	0.34	0.23
27MD_K	0.14	0.16	0.02	0.29	<u>-0.30</u>	-0.28	-0.48
27MD_S	0.17	0.18	-0.05	<u>0.32</u>	<u>-0.32</u>	<u>-0.30</u>	-0.49

Notes: here and in the following tables, bold and red, or blue, respectively, are significant reliable medium-strength direct and inverse correlations; underlining and sand, or green color, respectively, unreliable medium-strength direct and inverse correlations; HZ - tooth height; HKZ - height of the tooth crown; HRZ1 - length of the palatine root of the upper molars; HRZ2 - length of the dorsal proximal root of the upper molars; HRZ3 - length of the parietal distal root of the upper molars; VO_K - vestibular-lingual size of the tooth crown; VO_S - vestibular-lingual size of the neck of the tooth; MD_K - mesio-distal size of the tooth crown; MD_S - mesio-distal size of the tooth neck; DUG_GOP - the largest head circumference; DUGS_GOP - sagittal arch; DUG_AUAU - transverse arc; G_OP - the largest length of the head; FMT_FMT - the smallest width of the head (frontal diameter); EU_EU - the largest width of the head (occipital diameter); KRANIO - cranial index.

Table 2. Correlations of the sizes of molars of a mandible with cephalometric indicators of a brain skull of men of the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators						
	DUG_GOP	DUGS_GOP	DUG_AUAU	G_OP	EY_EY	FMT_FMT	KRANIO
47HZ	-0.14	-0.07	-0.08	-0.13	-0.10	0.00	-0.02
47HKZ	-0.25	-0.22	-0.19	-0.19	-0.14	-0.14	0.01
47HRZ4	-0.12	-0.14	0.01	-0.21	-0.20	-0.27	-0.04
47HRZ5	-0.09	0.11	0.24	0.13	0.20	0.33	0.10
47VO_K	0.06	<u>0.30</u>	0.26	<u>0.31</u>	<u>0.30</u>	<u>0.31</u>	-0.02
47VO_S	0.04	0.26	0.16	0.17	0.41	0.28	0.19
47MD_K	0.21	0.24	0.16	0.23	0.29	0.06	0.03

Continuation of table 2.

Sizes of molars	Cephalometric indicators						
	DUG_GOP	DUGS_GOP	DUG_AUAU	G_OP	EY_EY	FMT_FMT	KRANIO
47MD_S	0.08	0.01	0.03	0.11	0.15	0.05	0.05
46HZ	-0.06	-0.07	-0.10	0.07	-0.05	-0.14	-0.11
46HKZ	0.02	-0.01	0.10	-0.12	0.07	-0.05	0.10
46HRZ4	0.08	0.07	0.14	-0.03	-0.10	-0.12	-0.15
46HRZ5	-0.01	-0.17	0.00	0.19	-0.18	-0.21	-0.25
46VO_K	0.13	0.14	0.01	0.28	0.26	0.01	0.06
46VO_S	0.17	0.35	-0.08	0.32	0.41	0.27	0.15
46MD_K	0.17	0.35	0.24	0.28	0.48	0.34	0.19
46MD_S	0.18	0.31	0.22	0.18	0.28	0.28	0.15
36HZ	-0.06	-0.05	-0.02	0.04	-0.28	-0.27	-0.31
36HKZ	0.00	0.05	0.07	-0.06	-0.13	-0.24	-0.14
36HRZ4	-0.09	-0.09	-0.02	-0.09	-0.18	-0.18	-0.20
36HRZ5	0.03	-0.03	0.01	0.28	-0.24	-0.17	-0.34
36VO_K	0.29	0.34	0.27	0.39	0.35	0.10	0.09
36VO_S	0.20	0.38	0.13	0.42	0.37	0.20	0.05
36MD_K	0.15	0.31	0.30	0.24	0.51	0.30	0.26
36MD_S	0.08	0.25	0.13	0.20	0.37	0.26	0.20
37HZ	-0.01	-0.06	0.03	-0.04	-0.13	-0.01	-0.11
37HKZ	-0.11	-0.19	-0.10	-0.21	-0.11	-0.07	0.01
37HRZ4	-0.17	-0.27	-0.07	-0.27	-0.27	-0.23	-0.04
37HRZ5	-0.04	0.15	0.19	0.17	0.10	0.34	0.03
37VO_K	0.04	0.26	0.17	0.26	0.36	0.36	0.07
37VO_S	0.00	0.11	0.17	0.16	0.33	0.38	0.15
37MD_K	0.07	0.20	0.01	0.17	0.31	0.08	0.09
37MD_S	0.03	0.09	0.04	0.06	0.24	0.10	0.13

Notes: here and in the following tables, HRZ4 - the length of the near root of the lower molars; HRZ5 - the length of the distal root of the lower molars.

Table 3. Correlations of molar sizes of the upper jaw with cephalometric indicators of the facial skull of men from the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators								
	ZY_ZY	ZM_ZM	TR_GN	TR_N	N_GN	N_PRN	N_SN	GO_GO	N_STO
17HZ	0.00	-0.04	-0.08	-0.11	0.19	-0.13	-0.15	0.09	0.05
17HKZ	0.05	-0.13	-0.03	-0.09	0.20	-0.10	-0.13	-0.12	0.14
17HRZ1	-0.08	-0.04	-0.16	0.19	-0.16	-0.11	-0.08	-0.20	0.13
17HRZ2	0.08	0.08	-0.04	0.37	-0.16	-0.13	-0.02	-0.12	-0.04
17HRZ3	0.12	-0.21	0.16	-0.10	0.50	0.13	0.08	0.16	0.21
17VO_K	0.36	-0.22	0.29	0.14	0.09	0.39	0.32	0.03	0.25
17VO_S	0.38	-0.29	0.19	0.04	0.11	0.32	0.26	0.10	0.03
17MD_K	-0.02	-0.31	0.04	0.00	0.18	0.00	0.06	0.12	-0.13
17MD_S	0.04	-0.34	0.08	0.10	0.10	0.00	0.11	0.01	-0.10
16HZ	0.09	-0.02	0.08	0.13	0.15	-0.06	-0.05	0.13	0.11

Continuation of table 3.

Sizes of molars	Cephalometric indicators								
	ZY_ZY	ZM_ZM	TR_GN	TR_N	N_GN	N_PRN	N_SN	GO_GO	N_STO
16HKZ	0.10	-0.28	-0.08	-0.05	0.03	-0.12	-0.15	-0.17	0.11
16HRZ1	0.23	-0.40	0.21	0.28	0.16	0.10	0.13	-0.06	-0.02
16HRZ2	0.01	-0.02	-0.02	0.34	-0.06	-0.11	-0.04	-0.14	-0.18
16HRZ3	0.22	0.06	0.20	0.10	0.39	0.16	0.19	0.12	0.55
16VO_S	0.10	-0.22	0.31	0.38	0.06	0.14	0.18	0.13	0.02
16VO_K	0.20	-0.25	0.14	-0.02	-0.05	0.11	0.11	0.31	-0.21
16MD_S	-0.08	-0.05	-0.15	-0.02	-0.11	-0.30	-0.19	0.16	-0.11
16MD_K	-0.05	-0.09	-0.12	-0.03	-0.12	-0.32	-0.21	0.11	-0.13
26HZ	0.01	0.11	-0.05	0.04	0.07	-0.28	-0.25	0.18	0.00
26HKZ	0.04	-0.22	-0.16	-0.11	-0.04	-0.23	-0.22	-0.11	-0.01
26HRZ1	0.14	-0.17	-0.25	-0.10	0.10	-0.30	-0.27	-0.04	0.11
26HRZ2	0.07	0.00	-0.05	0.30	0.14	-0.15	-0.15	-0.05	-0.02
26HRZ3	0.24	0.14	0.12	0.12	0.25	0.10	0.14	0.26	0.33
26VO_K	0.23	-0.24	0.31	0.39	0.10	0.25	0.32	0.05	0.26
26VO_S	0.23	-0.32	0.17	0.02	0.00	0.16	0.22	0.07	0.07
26MD_K	-0.20	0.04	-0.16	-0.07	-0.09	-0.22	-0.12	0.09	-0.10
26MD_S	-0.16	-0.01	-0.27	-0.13	-0.20	-0.28	-0.16	0.03	-0.17
27HZ	-0.19	0.02	-0.14	-0.16	0.13	-0.11	-0.11	-0.13	0.08
27HKZ	-0.09	0.04	-0.27	-0.34	0.15	-0.25	-0.30	-0.19	0.16
27HRZ1	-0.04	-0.09	-0.09	0.17	-0.05	-0.08	-0.02	-0.11	0.10
27HRZ2	0.06	0.01	-0.10	0.37	-0.07	-0.32	-0.29	0.02	-0.06
27HRZ3	-0.02	-0.02	0.03	0.01	0.22	0.08	0.10	-0.07	0.12
27VO_K	0.13	-0.13	0.15	0.01	0.05	0.24	0.16	0.06	0.17
27VO_S	0.41	-0.34	0.25	0.17	0.00	0.21	0.16	0.17	-0.05
27MD_K	-0.16	-0.14	-0.01	-0.10	0.16	0.03	0.08	0.11	-0.12
27MD_S	-0.14	-0.20	-0.09	-0.12	0.14	-0.01	0.04	0.11	-0.14

Notes: here and in the following tables, inaccurate mean correlations of inverse correlations are highlighted by underlining and green color; ZY_ZY - face width (distance between zygomatic points); ZM_ZM - average width of the face; TR_GN - physiological length of the face; TR_N - forehead height; N_GN - morphological length of the face; N_PRN - length of the nose; N_SN - nose height; GO_GO - width of the lower jaw (width between the corners of the lower jaw); N_STO - height of the upper part of the face.

Table 4. Correlations of the sizes of molars of a mandible with cephalometric indicators of a facial skull of men of the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators								
	ZY_ZY	ZM_ZM	TR_GN	TR_N	N_GN	N_PRN	N_SN	GO_GO	N_STO
47HZ	-0.06	0.04	-0.23	-0.24	0.24	-0.08	-0.11	-0.25	0.10
47HKZ	-0.21	0.07	-0.31	-0.32	0.13	-0.09	-0.15	-0.16	-0.01
47HRZ4	-0.19	0.01	-0.32	-0.20	0.01	-0.25	-0.24	-0.11	-0.28
47HRZ5	0.17	0.05	0.13	0.16	0.21	0.14	0.12	-0.24	0.29
47VO_K	0.30	-0.07	0.18	0.20	0.10	0.26	0.30	-0.07	0.36
47VO_S	0.28	-0.14	0.25	-0.04	0.14	0.21	0.22	0.20	0.20
47MD_K	0.21	-0.17	0.29	0.11	0.28	0.27	0.27	0.18	0.23
47MD_S	0.17	-0.15	0.13	0.02	0.14	0.01	0.03	0.22	0.03

Continuation of table 4.

Sizes of molars	Cephalometric indicators								
	ZY_ZY	ZM_ZM	TR_GN	TR_N	N_GN	N_PRN	N_SN	GO_GO	N_STO
46HZ	-0.17	-0.01	-0.32	-0.25	0.01	-0.07	-0.05	-0.25	0.02
46HKZ	0.01	-0.10	-0.11	-0.05	0.10	0.16	0.10	0.01	0.03
46HRZ4	-0.05	-0.19	-0.17	-0.12	0.00	-0.16	-0.23	0.06	-0.23
46HRZ5	-0.23	0.12	-0.04	0.08	0.13	-0.15	-0.08	-0.10	0.05
46VO_K	0.08	0.13	0.07	-0.03	0.14	0.01	0.12	0.11	0.23
46VO_S	0.31	-0.23	0.23	0.10	0.17	0.25	0.35	0.14	0.34
46MD_K	0.39	-0.22	0.35	0.10	0.19	0.24	0.25	0.25	0.28
46MD_S	0.33	-0.14	0.26	0.15	0.02	0.09	0.12	0.22	0.07
36HZ	-0.19	0.02	-0.39	-0.22	0.03	-0.21	-0.23	-0.12	-0.06
36HKZ	-0.08	-0.14	-0.11	-0.07	0.16	-0.02	-0.06	0.06	-0.02
36HRZ4	-0.13	-0.14	-0.25	-0.23	0.08	-0.19	-0.26	-0.09	-0.13
36HRZ5	-0.12	0.16	-0.11	0.01	0.11	-0.16	-0.10	-0.02	0.06
36VO_K	0.18	0.09	0.15	0.08	-0.03	0.22	0.35	0.14	0.17
36VO_S	0.23	-0.10	0.15	0.04	0.05	0.28	0.40	0.13	0.31
36MD_K	0.29	-0.04	0.27	0.03	0.15	0.30	0.30	0.19	0.29
36MD_S	0.27	-0.14	0.25	0.04	0.02	0.17	0.20	0.21	0.11
37HZ	0.02	-0.07	-0.28	-0.11	0.16	-0.23	-0.26	-0.03	-0.04
37HKZ	-0.08	0.02	-0.26	-0.23	0.16	-0.17	-0.24	0.04	-0.07
37HRZ4	-0.18	0.02	-0.37	-0.22	-0.05	-0.30	-0.31	-0.12	-0.34
37HRZ5	0.29	-0.20	-0.06	0.19	0.07	-0.07	-0.07	-0.06	0.01
37VO_K	0.34	-0.02	0.13	0.13	0.07	0.28	0.32	-0.10	0.38
37VO_S	0.37	-0.18	0.10	-0.02	0.05	0.06	0.09	0.15	0.18
37MD_K	0.20	-0.23	0.26	0.01	0.34	0.31	0.28	0.16	0.29
37MD_S	0.14	-0.10	0.22	-0.03	0.21	0.31	0.26	0.20	0.15

Table 5. Correlations of molar sizes of the upper jaw with cephalometric indicators of the facial skull of men in the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators								
	SN_PRN	AL_AL	CHI_CHI	EK_EK	MF_MF	N_I	PGO_GN	IGO_GN	IN_GARS
17HZ	0.16	-0.29	0.03	0.28	0.06	0.24	0.01	0.01	0.15
17HKZ	0.27	-0.35	-0.24	0.07	0.02	0.14	0.05	0.00	0.21
17HRZ1	0.02	-0.04	-0.04	0.22	-0.22	-0.18	0.49	0.45	-0.06
17HRZ2	-0.01	0.24	0.00	0.40	0.23	-0.11	0.23	0.18	-0.23
17HRZ3	0.19	-0.36	-0.03	0.14	-0.01	0.61	-0.16	-0.23	0.47
17VO_K	0.31	-0.08	-0.06	0.23	0.07	0.20	0.18	0.13	0.01
17VO_S	0.20	-0.02	-0.08	0.17	-0.06	0.15	0.26	0.25	0.07
17MD_K	-0.12	-0.02	0.02	0.09	-0.31	0.25	-0.09	-0.03	0.42
17MD_S	-0.18	-0.04	0.00	0.03	-0.34	0.10	-0.04	0.05	-0.31
16HZ	0.29	-0.11	0.14	0.37	0.16	0.15	0.19	0.18	0.07
16HKZ	0.04	-0.32	-0.20	0.08	0.10	0.05	0.03	-0.08	0.14
16HRZ1	-0.02	-0.08	-0.23	0.07	-0.02	0.04	0.11	0.04	0.26
16HRZ2	0.12	0.37	0.07	0.46	0.08	-0.15	0.42	0.37	-0.01

Continuation of table 5.

Sizes of molars	Cephalometric indicators								
	SN_PRN	AL_AL	CHI_CHI	EK_EK	MF_MF	N_I	PGO_GN	IGO_GN	IN_GARS
16HRZ3	0.29	-0.37	-0.11	0.18	-0.02	0.43	-0.04	0.01	0.12
16VO_S	0.04	0.07	0.27	0.34	0.15	0.03	0.19	0.21	0.16
16VO_K	0.10	0.15	-0.02	0.31	0.10	0.04	0.25	0.22	-0.01
16MD_S	-0.05	0.13	0.23	0.31	0.01	-0.07	0.02	0.10	0.00
16MD_K	-0.09	0.04	0.21	0.16	0.01	-0.04	-0.10	-0.01	0.07
26HZ	0.26	0.02	0.21	0.43	0.13	0.09	0.18	0.24	0.02
26HKZ	0.12	-0.19	0.04	0.12	-0.15	-0.08	0.25	0.22	0.12
26HRZ1	0.15	-0.14	0.00	0.06	-0.07	-0.03	0.06	0.07	0.13
26HRZ2	0.12	0.18	-0.19	0.39	0.22	0.07	0.23	0.20	0.10
26HRZ3	0.30	-0.16	0.15	0.33	0.06	0.27	-0.03	0.06	-0.04
26VO_K	0.22	0.05	0.08	0.23	-0.05	-0.03	0.34	0.38	0.10
26VO_S	0.18	0.12	-0.04	0.17	-0.13	0.08	0.27	0.32	0.12
26MD_K	-0.07	0.15	0.23	0.24	-0.01	0.01	-0.06	0.04	0.04
26MD_S	-0.05	0.09	0.21	0.19	-0.02	-0.09	-0.01	0.07	0.01
27HZ	0.23	-0.27	-0.06	0.09	-0.10	0.13	-0.03	-0.05	0.21
27HKZ	0.24	-0.48	-0.15	-0.15	-0.07	0.11	-0.14	-0.20	0.14
27HRZ1	0.15	-0.05	-0.11	0.30	-0.22	-0.10	0.43	0.35	0.00
27HRZ2	-0.05	0.08	-0.11	0.52	0.48	-0.05	0.17	0.10	-0.09
27HRZ3	0.18	-0.11	0.09	0.25	-0.01	0.32	-0.05	-0.08	0.22
27VO_K	0.38	-0.02	0.12	0.23	-0.09	0.15	0.31	0.25	0.04
27VO_S	0.11	0.08	-0.15	0.28	0.06	0.14	0.36	0.34	0.02
27MD_K	0.01	0.00	0.08	0.06	-0.31	0.19	-0.07	0.01	0.34
27MD_S	-0.02	-0.02	0.05	0.03	-0.30	0.17	-0.09	-0.02	0.35

Notes: here and in the following tables, SN_PRN - the depth of the nose; AL_AL - width of the base of the nose (distance between alar points); CHI_CHI - width of the oral slit; EK_EK - extraocular width (biorbital width); MF_MF - interorbital width (anterior interorbital width); N_I - the distance between the nasion and the intercanine point; RGO_GN - body length of the lower jaw on the right; LGO_GN - body length of the lower jaw on the left; IN_GARS - Garson's morphological index.

Table 6. Correlations of the sizes of molars of a mandible with cephalometric indicators of a facial skull of men of the western region of Ukraine (n=16-36).

Sizes of molars	Cephalometric indicators								
	SN_PRN	AL_AL	CHI_CHI	EK_EK	MF_MF	N_I	PGO_GN	IGO_GN	IN_GARS
47HZ	0.18	-0.14	-0.27	-0.09	0.04	0.24	-0.25	-0.28	0.23
47HKZ	0.18	-0.05	-0.19	-0.07	-0.01	0.20	-0.15	-0.20	0.21
47HRZ4	-0.01	0.05	-0.21	0.11	-0.11	-0.01	-0.01	0.01	0.15
47HRZ5	0.27	-0.23	-0.12	-0.02	0.25	0.24	-0.17	-0.22	0.06
47VO_K	0.23	0.10	-0.13	0.40	0.15	0.33	0.16	0.09	-0.08
47VO_S	0.14	0.00	-0.06	0.33	0.07	0.41	0.11	0.10	0.02
47MD_K	0.30	0.19	-0.07	0.43	-0.05	0.41	0.28	0.24	0.15
47MD_S	0.21	0.17	-0.02	0.45	-0.05	0.21	0.42	0.47	0.14
46HZ	0.03	0.15	-0.06	-0.06	-0.13	0.18	-0.13	-0.19	0.16
46HKZ	-0.03	0.00	-0.08	0.02	0.05	0.18	-0.01	-0.04	0.13
46HRZ4	-0.03	0.00	-0.04	0.06	0.10	0.04	-0.07	-0.16	0.14

Continuation of table 6.

Sizes of molars	Cephalometric indicators								
	SN_PRN	AL_AL	CHI_CHI	EK_EK	MF_MF	N_I	PGO_GN	IGO_GN	IN_GARS
46HRZ5	-0.04	0.10	0.09	0.22	0.03	<u>0.30</u>	-0.12	-0.09	0.24
46VO_K	0.37	0.04	0.10	0.15	-0.33	0.23	0.10	0.20	-0.01
46VO_S	0.35	0.02	0.00	0.17	-0.15	<u>0.31</u>	0.16	0.18	0.13
46MD_K	0.46	-0.11	0.04	<u>0.30</u>	-0.14	<u>0.31</u>	0.33	0.29	0.02
46MD_S	0.44	0.15	0.07	0.33	-0.05	0.05	0.36	0.43	-0.06
36HZ	-0.03	0.06	-0.10	0.00	0.06	0.11	-0.21	-0.25	0.17
36HKZ	-0.07	-0.07	-0.15	0.05	0.03	0.13	-0.01	-0.05	0.25
36HRZ4	-0.04	-0.03	-0.14	0.02	0.06	0.12	-0.07	-0.15	0.24
36HRZ5	-0.02	0.03	0.13	0.12	0.18	0.24	-0.29	-0.29	0.12
36VO_K	0.27	0.10	0.14	0.12	-0.33	0.11	0.19	0.28	-0.20
36VO_S	0.29	0.06	0.07	0.19	-0.16	0.22	0.21	0.24	-0.03
36MD_K	0.52	-0.06	0.04	0.23	-0.15	0.29	0.29	0.26	-0.08
36MD_S	0.47	0.14	0.09	0.22	-0.17	0.08	0.36	0.40	-0.05
37HZ	0.05	-0.13	-0.27	0.11	0.15	0.13	-0.02	-0.06	0.17
37HKZ	0.11	-0.12	-0.18	0.07	0.11	0.16	-0.07	-0.08	0.17
37HRZ4	-0.07	-0.03	-0.19	0.09	-0.01	-0.06	-0.02	0.04	0.13
37HRZ5	0.10	-0.13	-0.07	0.20	0.25	0.08	0.12	0.01	0.05
37VO_K	0.25	0.14	-0.09	<u>0.32</u>	0.09	0.29	0.16	0.11	-0.14
37VO_S	0.12	-0.11	-0.14	0.36	0.11	0.26	0.29	<u>0.30</u>	-0.04
37MD_K	0.35	0.08	-0.12	0.33	-0.10	0.46	0.25	0.20	0.26
37MD_S	0.37	0.10	-0.03	0.27	-0.02	<u>0.30</u>	0.28	0.29	0.13

Discussion

In a survey of 200 people of North African ethnic group, it was found that there is a pronounced correlation between the shape of the face and the shape of the central incisor of the upper jaw ($p < 0.05$) [1]. Also, statistically significant relationships between orthodontic and cephalometric indicators were found in the study of ethnic groups of Malays and Chinese [11]. Brazilian scientists have found the most pronounced correlations between the size of the anterior maxillary incisor and the oval shape of the face [18].

At the same time, Indian scientists have not found a relationship between the indicators of the central incisor and the height of the face [5] and the indicators of the front maxillary teeth and the lower height or shape of the face [8, 26].

When presenting a study involving 149 students aged 18-30 years with subsequent statistical processing of the data on cephalometric and orthodontic examination, correlations were found between the proportions of the subjects and the size of the maxillary central incisor [21]. Similar data were also obtained by a group of Indian scientists led by N. Raghavendra [22], Brazilian [24] and Jordanian researchers [25] on local populations.

Quantitative analysis of reliable and average unreliable

correlations of linear computed tomographic dimensions of molars with cephalometric indicators and indices of practically healthy men of the western region of Ukraine revealed the following distribution of connections:

between the upper molars and cranial skull indicators
31 correlation out of 252 possible (12.3%), of which, 2.8% of direct reliable average forces, 4.8% of direct unreliable average forces, 2.8% of inverse reliable average forces and 2.0% of inverse unreliable average forces; among which - with the first molars teeth 12 correlation from 126 possible (3.2% of direct reliable average force, 4.0% of direct unreliable average force, 1.6% of inverse reliable average force and 0.8% of return unreliable average force); with the second molars teeth 19 correlation from 126 possible (2.4% of direct reliable average force, 5.6% of direct unreliable average force, 4.0% of inverse reliable average force and 3.2% of inverse unreliable average force); with the height of the teeth, their crowns and the length of the roots of 8 correlation out of 140 possible (4.3% of direct unreliable medium strength, 0.7% of inverse reliable medium strength and 0.7% of inverse unreliable medium strength); with vestibular-lingual and mesio-distal dimensions, 23 correlation out of 112 possible (6.3% of direct reliable medium forces, 5.4% of direct unreliable

medium forces, 5.4% of reverse reliable medium forces and 3.6% of inverse unreliable medium forces);

between lower molars and cranial skull indicators 32 correlation out of 224 possible (14.3%), of which, 8.5% of direct reliable average forces, 4.9% of direct unreliable average forces, 0.4% of inverse reliable average forces and 0.4% of inverse unreliable average forces; among which - with the first molars teeth 20 correlation from 112 possible (11.6% of direct reliable average forces, 4.5% of direct unreliable average forces, 0.9% of inverse reliable average forces and 0.9% of return unreliable average forces); with the second molars teeth 12 correlation from 112 possible (5.4% of direct reliable average force and 5.4% of direct unreliable average force); with the height of the teeth, their crowns and the length of the roots, only 4 correlation out of 112 possible (1.8% of direct reliable average forces, 0.9% of inverse reliable average forces and 0.9% of inverse unreliable average forces); with vestibular-lingual and mesio-distal dimensions of 28 correlation out of 112 possible (15.2% of direct reliable average forces and 9.8% of direct unreliable average forces);

between the upper molars and facial skull indicators 76 correlation out of 648 possible (11.7%), of which, 0.2% direct reliable strong, 6.0% direct reliable medium strength, 2.3% direct unreliable medium strength, 1.4% inverse reliable medium strength and 1.9% of reverse unreliable average forces; among which - with the first molars teeth 34 correlation from 324 possible (5.6% of direct reliable average force, 2.8% of direct unreliable average force, 0.6% of inverse reliable average force and 1.5% of inverse unreliable average force); with the second molars teeth 42 correlation from 324 possible (0.3% of direct reliable strong, 6.5% of direct reliable average force, 1.9% of direct unreliable average force, 2.2% of return reliable average force and 2.2% of inverse unreliable average force); with the height of the teeth, their crowns and the length of the roots 39 correlation out of 360 possible (0.3% direct reliable strong, 6.7% direct reliable medium force, 1.1% direct unreliable medium force, 1.7% reverse reliable medium force and 1.1% reverse unreliable medium force); with vestibular-lingual and mesio-distal dimensions, 37 correlation out of 288 possible (5.2% of direct reliable medium forces, 3.8% of direct unreliable medium forces, 1.0% of inverse reliable medium forces and 2.8% of inverse unreliable middle forces);

between the lower molars and facial skull indicators 66 correlation out of 576 possible (11.5%), of which, 6.3% direct reliable medium strength, 3.3% direct unreliable medium strength, 0.7% reverse reliable medium strength and 1.2% reverse unreliable average strength; among

which - with the first molars teeth 31 correlation from 288 possible (6.3% of direct reliable average forces, 3.1% of direct unreliable average forces, 0.7% of inverse reliable average forces and 0.7% of inverse unreliable average forces); with the second molars teeth 35 correlation from 288 possible (6.3% of direct reliable average forces, 3.5% of direct unreliable average forces, 0.7% of return reliable average forces and 1.7% of inverse unreliable average forces); with the height of the teeth, their crowns and the length of the roots 10 correlation out of 288 possible (0.3% of direct unreliable average forces, 1.0% of inverse reliable average forces and 2.1% of inverse unreliable average forces); with vestibular-lingual and mesio-distal dimensions 56 correlation out of 288 possible (12.5% of direct reliable medium forces, 6.3% of direct unreliable medium forces, 0.3% of inverse reliable medium forces and 0.3% of inverse unreliable middle forces).

Our results for men from the southern region of Ukraine differ from similar studies of the relationship between the size of molars with cephalometric indicators of men from the northern region of Ukraine [19], which confirms the need to take into account regional characteristics.

Thus, the data obtained by us are fully consistent with the results of both domestic and foreign studies, which indicates the viability of the chosen area of research and requires subsequent collection and analysis of data on other groups of the population of Ukraine.

Conclusions

1. The percentage of mostly direct, reliable and medium-strength unreliable correlations of linear sizes of molars with cephalometric indicators and indices of practically healthy men of the western region of Ukraine with indicators of cerebral or facial skull practically does not differ (12.3% between upper molars and indicators of a brain skull - 11.7% between the upper molars and indicators of the facial skull and 14.3% between the lower molars and the indicators of the skull - 11.5% between the lower molars and the indicators of the facial skull).

2. The largest number of reliable and medium-strength unreliable correlations of linear sizes of molars with indicators of a skull is established with vestibular-lingual and mesio-distal sizes of teeth (20.5% with upper molars and 25.0% with lower molars).

3. The largest number of reliable and medium-strength unreliable correlations of linear molars sizes with facial skull indices was established for upper molars with tooth height, crowns and root length (10.8%) and vestibular-lingual and mesio-distal dimensions (12.8%), and for lower molars - only with vestibular-lingual and mesio-distal dimensions (19.4%).

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ОСОБЛИВОСТІ КОРЕЛЯЦІЙ РОЗМІРІВ ВЕЛИКИХ КУТНІХ ЗУБІВ ІЗ КЕФАЛОМЕТРИЧНИМИ ПОКАЗНИКАМИ ЧОЛОВІКІВ ЗАХІДНОГО РЕГІОНУ УКРАЇНИ

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Розширення теоретичних знань медичної антропології в сучасній сфері надання стоматологічних послуг є одним з головних

рушіїв прогресу у ортодонтичній галузі. Єдиним шляхом успішного розвитку взаємовідносин даних дисциплін є створення і наповнення бази нормативних даних та пошук у ній зв'язків між різноманітними, як очевидно пов'язаними, так і на перший погляд, абсолютно не пов'язаними структурами тіла людини. Мета дослідження - визначити особливості зв'язків лінійних розмірів великих кутніх зубів (ВКЗ) із кефалометричними показниками практично здорових чоловіків першого зрілого віку, жителів західного регіону України. У 36 практично здорових чоловіків першого зрілого віку, жителів західного регіону України (із Рівненської, Волинської, Чернівецької, Львівської, Тернопільської, Хмельницької, Івано-Франківської та Закарпатської областей) проведено конусно-променеву комп'ютерну томографію з наступною одонтометриєю великих кутніх зубів і кефалометричне дослідження. Статистичну обробку результатів проведено у ліцензійному пакеті "Statistica 6.1" за допомогою непараметричної статистики Спірмена. В результаті кількісного аналізу достовірних і середньої сили недостовірних кореляцій лінійних комп'ютерно-томографічних розмірів ВКЗ із кефалометричними показниками та індексами практично здорових чоловіків західного регіону України встановлено, що відсоток, переважно прямих, достовірних і середньої сили недостовірних кореляцій лінійних розмірів ВКЗ із кефалометричними показниками та індексами з показниками мозкового, або лицевого черепу практично не відрізняється. Найбільша кількість достовірних і середньої сили недостовірних кореляцій лінійних розмірів ВКЗ із показниками мозкового черепу встановлена з присінково-язиковими та мезіо-дистальними розмірами зубів (20,5% із верхніми ВКЗ та 25,0% із нижніми ВКЗ). Найбільша кількість достовірних і середньої сили недостовірних кореляцій лінійних розмірів ВКЗ із показниками лицевого черепу встановлена для верхніх ВКЗ з висотою зубів, їх коронок і довжиною коренів (10,8%) та присінково-язиковими та мезіо-дистальними розмірами (12,8%), а для нижніх ВКЗ - лише з присінково-язиковими та мезіо-дистальними розмірами (19,4%). Отримані дані засвідчують перспективність обраного наукового напрямку досліджень, що в подальшому дозволить покращити роботу лікарів у різних напрямках медицини, зокрема і превентивної.

Ключові слова: комп'ютерна томографія, великі кутні зуби, одонтометрія, кефалометрія, кореляції, практично здорові чоловіки, адміністративно-територіальні регіони України.

ОСОБЕННОСТИ КОРРЕЛЯЦИЙ РАЗМЕРОВ БОЛЬШИХ КОРЕННЫХ ЗУБОВ С КЕФАЛОМЕТРИЧЕСКИМИ ПОКАЗАТЕЛЯМИ МУЖЧИН ЗАПАДНОГО РЕГИОНА УКРАИНЫ

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Расширение теоретических знаний медицинской антропологии в современной сфере предоставления стоматологических услуг является одним из главных двигателей прогресса в ортодонтической области. Единственным путем успешного развития взаимоотношений данных дисциплин является создание и наполнение базы нормативных данных и поиск в ней связей между различными, как очевидно связанными, так и на первый взгляд, совершенно не связанными структурами тела человека. Цель исследования - определить особенности связей линейных размеров больших коренных зубов (БКЗ) с кефалометрическими показателями практически здоровых мужчин первого зрелого возраста, жителей западного региона Украины. У 36 практически здоровых мужчин первого зрелого возраста, жителей западного региона Украины (с Ровенской, Волынской, Черновицкой, Львовской, Тернопольской, Хмельницкой, Ивано-Франковской и Закарпатской областей) проведено конусно-лучевую компьютерную томографию с последующей одонтометрией больших коренных зубов и кефалометрическое исследование. Статистическую обработку результатов проведено в лицензионном пакете "Statistica 6.1" с помощью непараметрической статистики Спирмена. В результате количественного анализа достоверных и средней силы недостоверных корреляций линейных компьютерно-томографических размеров БКЗ с кефалометрическими показателями и индексами практически здоровых мужчин западного региона Украины установлено, что процент, преимущественно прямых, достоверных и средней силы недостоверных корреляций линейных размеров БКЗ с кефалометрическими показателями и индексами с показателями мозгового или лицевого черепа практически не отличается. Наибольшее количество достоверных и средней силы недостоверных корреляций линейных размеров БКЗ с показателями мозгового черепа установлена с преддверно-языковыми и мезио-дистальными размерами зубов (20,5% с верхними БКЗ и 25,0% с нижними БКЗ). Наибольшее количество достоверных и средней силы недостоверных корреляций линейных размеров БКЗ с показателями лицевого черепа установлена для верхних БКЗ с высотой зубов, их коронок и длиной корней (10,8%) и преддверно-языковыми и мезио-дистальными размерами (12,8%), а для нижних БКЗ - только с преддверно-языковыми и мезио-дистальными размерами (19,4%). Полученные данные свидетельствуют о перспективности выбранного научного направления исследований, и в дальнейшем позволит улучшить работу врачей в разных направлениях медицины, в том числе и превентивной.

Ключевые слова: компьютерная томография, большие коренные зубы, одонтометрия, кефалометрия, корреляции, практически здоровые мужчины, административно-территориальные регионы Украины.