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CONNECTIONS OF TRANSVERSAL VOLUMES OF THE UPPER AND LOWER JAW AND SAGITTAL CHARACTERISTICS OF THE DENTAL ARCH WITH ODONTOMETRIC AND CEPHALOMETRIC INDICATORS OF YOUTH-BRACHYCEPHALS WITH ORTHOGNATIC BITE

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The article describes and analyzes the correlation of computer-tomographic characteristics of dental arcs with odontometric and cephalometric indices of youth-brachycephals with orthognathic bite. Relative majority of predominantly direct mean forces, correlations of linear sizes necessary for constructing the correct form of the dental arch with the size of the teeth and the cephalometric indices in the brachycephalic males are established with the parameters of the maxillary dental arch in the sagittal plane (43.0%), and the smallest - with the parameters of the maxillary dental arcs in the vertical plane (24.4%). With the transversal dimensions of the upper and lower jaw, the relative number of such correlations is 32.3%. The greatest number of correlations of the size of the teeth with transversal dimensions of the upper and lower jaw are established with mesiodistal (53.5% of the total number of links between these indices) and vestibular-tongue (50.7%) size of the crowns of the teeth and with the width of the dentin-enamel border in the vestibular-tongue direction (54.2%); with the parameters of the maxillary dental arch in the sagittal plane - almost similar distribution is maintained (80.6% with mesiodistal dimensions of crowns of teeth, 83.3% with vestibular-tongue dimensions of crowns of teeth, 72.2% with width of dentin-enamel border in vestibular-tongue direction, 72.2% with the width of the dentin-enamel border in the mesiodistal direction); with the parameters of the maxillary dental arc in the vertical plane there is a completely different distribution - the greatest number of correlations is established only with the width of the dentin-enamel border in the vestibular-tongue direction (38.9%) and with the cephalometric indices (34.3%).

Key words: youth-brachycephals with orthognatic bite, correlations, cephalometric indicators.

The work is a fragment of the RSW "Mechanisms of the influence of pathogenic factors on the dental status of persons with somatic pathology, ways of their correction and blocking" (state registration number: 0115U001138).

The urgency of studying the forms and sizes of dental arches at physiological and pathological occlusion is substantiated in the works of both domestic and foreign researchers. These parameters are essential factors that determine the success and stability of orthodontic and orthopedic treatment, affecting the functionality and aesthetics of occlusion [6, 19]. In recent years, in the world literature, there have been studies that focus on the study of the connections of craniotypes with odontometric indices, dimensions, form of dental arches and bite. At the same time, in most cases, specialists focus on the study of individual features of the structure of the dento-jaw system in people with different types of faces, as well as aspects of sexual dimorphism and ethnic characteristics [1, 4, 14, 18]. The number of studies containing information on craniotypological variability of dental arches is negligible [20]. The intrapopulation and intergroup analysis of the correlation of the total variability of these odonto-cephalometric features becomes as accurate and valid as possible due to the use of modern methods of collecting, processing material using multidimensional statistics. Inaccuracy in the definition of associations of morphometric features of the dental arches of the upper and lower jaw with the size of the teeth and skull structures in individuals with a certain craniotype is inadmissible, since it leads to the production of false diagnoses, and, as a consequence, to the selection of the wrong tactics of treatment [8, 21].

The purpose of the work is to analyze the connections of computer tomography transversal volumes of the upper and lower jaw and sagittal characteristics of the dental arch with odontometric and cephalometric indicators of youth-brachycephals with orthognatic bite.

Material and methods. Primary indices of teeth and heads of youths from Podillia with orthognathic bite (n = 44, determined by 11 points according to M.G. Bushan et al. [3]) were obtained from the data bank of the Research center of the Vinnitsa National Medical University n.a. Pirogov within the framework of the agreement on creative cooperation between Vinnitsa National Medical University named after M.I. Pirogov and HSNIU "Ukrainian Medical Dentistry Academy" (Contract No. 1 dated 05.01.2015). For this study, a dental cone-ray tomograph was used - Veraviewepocs 3D, Moret (Japan). The studies were carried out in accordance with the self-developed scheme [10] within these characteristics. The volume of the three-dimensional image is a cylinder 8x8см, - thickness of layer 0,2/0,125 mm, irradiation dose 0,11-0,48 mSv, voltage and current strength of 60-90kV/2-10mA. In the upper and lower incisors, the canines, small and first large angular teeth were measured: the length of the tooth; the length of the root in the vestibule-lingual and mesiodistal projections; mesiodistal crown size of the tooth; vestibule-lingual size; the width of the dentin-enamel border in the mesiodistal direction; the width of the dentin-enamel border in the vestibule-tongue direction. Since in previous studies, when comparing the computer-tomographic metric characteristics of the same tooth names on the right and left sides, there were no reliable or trend differences, we in subsequent studies used mean values of the corresponding teeth on the upper and lower jaws [11, 16].

The following transversal dimensions of the upper and lower jaw and sagittal characteristics of the dental arch were also determined: the distance between the tops of the palatal roots of the upper first large angular teeth; distance between tops of distal roots of the upper first large angular teeth; the distance between the tops of the medial roots of the upper first large angular teeth; the distance between the tops of the medial roots of the lower first large angular teeth; distance between tops of distal roots of the lower first large angular teeth; distance between the jaws of the upper jaw; the distance between the tops of the roots of the jaw of the upper jaw; the distance between the jaws of the lower jaw; the distance between the tops of the root of the jaw of the mandible; the distance between the points of Pon on the upper first large angular teeth; the distance between the points of Pon on the upper first small angular teeth; the distance between the vestibular medial bulges of the first large angular teeth; canine sagittal distance of the upper jaw; premolar sagittal distance of the upper jaw; molar sagittal distance of the upper jaw; depth of the palatine at the level of the canine; depth of the palate at the level of the first small angular teeth; the depth of the palate at the level of the first large angular teeth. The following cephalometric dimensions were determined [2]: sagittal arc, transverse arc, greatest girth of the head, projection distance from the top of the head (vertex) to the upper edge of the auditory opening, largest head length, greatest head width, smallest head width, average face width, face width, external-eye width, between-eye width, nose basic width, oral cavity width, ear diameter, forehead height, physiological face length, nose length, nose height, nose depth, height of the upper face, distance between nasion and between-canine point, distance between nasion and prostpion, morphological length of face, height of upper lip, height of lower lip, height of lower face, height of red border of lips, width of mandible, body length of mandible, distance from auricular point to chin, distance from auricular points to the angle of the lower jaw, the distance from the auricular point to the glabella, the distance from the auricular point to the nazion, the distance from the auricular point to the subnazion, the distance from the auricular point to the intersection point. The division of boys and girls into groups occurred according to the main indicator. The values of the index were obtained according to the formula: the largest length of the head / the largest head width × 100. Up to a value of 75.9 subjects were attributed to dolichocephals; 76,0-80,9 - to mesocephals; 81.0-85.4 - to brachycephals; more than 85,5 - to hyperbrachycephals. Among the young men, 6 dolichocephals, 16 mesocephals, 19 brachycephals, and 3 hyperbrachycephals were identified. The analysis of correlations of the obtained results in youth-brachycephals was carried out using the Spirman statistical method in the statistical package "Statistica 6.0".

Results and its discussion. According to the data of scientific literature and proceeding from the commonality of ontogenetic development, the size of the dental arches correlates with the parameters of the jaws, facial, cerebral sections of the skull and the whole organism as a whole [9, 22]. In brachycephals males with orthognathic bite, the following multiple bonds of reliable and average strength of false correlations of the transversal dimensions of the upper and lower jaw and sagittal characteristics of the dental arch with odometometric and cephalometric indices are established: direct reliable average force (r from 0.49 to 0.59) and strong (r from 0.60 to 0.77), unreliable mean force (r from 0.33 to 0.45) connections of distances between the tops of the distal and medial roots of the upper first large angular teeth, between the points of the Pon on the upper first large and small molar teeth and between the medial vestibular hillocks first large molar teeth with most mesiodistal size of crowns of teeth; direct, mostly of average strength, reliable (r from 0.47 to 0.58) and unreliable (r from 0.30 to 0.42) connections distances between the tops of the distal and medial roots of the lower first large angular teeth and between the tubercles of the canines and tops of the jaws of the mandible with more than half the mesiodistal dimensions of the crowns of the teeth; direct, mostly of average strength, unreliable (r ranging from 0.30 to 0.44), reliable average force (r ranges from 0.46 to 0.57) and strong (r from 0.61 to 0.69) bonds between Pon points on the upper first large angular teeth, vestibular medial bulges of the first large angular teeth, and between the tubercles of the canines and tops of the root of the jaw of the mandible with most of the vestibular-tongue dimensions of the crowns of the teeth; direct, mostly medium forces, unreliable (r from 0.30 to 0.49) and a reliable average force (r from 0.47 to 0.58) connections distances between the tops of the distal and medial roots of the upper and lower first large angular teeth, between the points of the Pon on the upper first small angular teeth and between the tubercles of the jaws of the upper jaw and half of the vestibular-tongue dimensions of the crowns of the teeth; direct, mostly medium forces unreliable (r from 0.32 to 0.45) and a reliable average force (r from 0.46 to 0.59) bundles of distances between the tubercles of the canines and the tops of the jaws of the root of the mandible with most of the width parameters dentin-enamel border in mesiodistal and vestibular-tongue directions; the direct mean strength significant (r from 0.49 to 0.53) and unreliable (r from 0.30 to 0.43) connections distances between the tops of the distal roots of the upper first large angular teeth, the medial roots of the lower first large angular teeth, between the points of the Pon on the upper first large and small angular teeth, between the vestibular medial bulges of the first large angular teeth and between the tubercles of the jaw of the upper jaw with more than half of the dentine-enamel width measurements in the vestibular-tongue direction; predominantly direct mean strength unreliable (r from 0.30 to 0.43) relationship between the vestibular medial bulges of the first large angular teeth and the tops of the roots of the jaw of the mandible with more than half of the length of the teeth; direct average strength is reliable (r ranges from 0.46 to 0.58) and unreliable (r from 0.30 to 0.44) bundles between the tops of the medial roots of the upper and lower first large angular teeth with most of the indices of individual faces; direct reliable average forces (r from 0.46 to 0.59), uncertain average strength (r from 0.30 to 0.45) and strong (r from 0.60 to 0.82) ties of all parameters of the maxillary dental arches in the sagittal plane with the majority of mesiodistal and vestibular-tongue dimensions of the crowns of the teeth and the width of the dentin-enamel border in the mesiodistal and vestibular-tongue directions; direct, mostly reliable, average strength (r from 0,49 to 0,57) connections of all parameters of the maxillo-articular dental arc in the vertical plane with almost a third of the cephalometric indices.

In analyzing the reliable and average strength of the unreliable correlations of the transversal dimensions of the upper and lower jaw and sagittal characteristics of the dental artery with odontometric and cephalometric indices of brachycephalic males with orthognathic bite, we identified 361 connections from 1116 possible (32.3%) with dental arch parameters frontal plane (of which 29 - 2.6% of direct forces, 92 - 8.2% of direct average forces, 210 - 18.8% of false direct average forces, 5 - 0.4% of reciprocal average strength, 25 - 2, 2% of unreliable reciprocal average strength); 120 connections from 279 possible (43.0%) with parameters of maxillary dental arc in the sagittal plane (of which 15 - 5.4% of direct strengths, 37 - 13.3% of direct average strength, 67 - 24.0% false direct middle forces; 1 - 0.4% of false reciprocal average forces); 68 connections from 279 possible (24.4%) with the parameters of maxillary dental arc in the vertical plane (of which 2 - 0.7% of direct strength, 17 - 6.1% of direct average strength, 39 - 14.0% false direct middle forces, 3 - 1,1% of reciprocal average strength, 7 - 2,5% of false reciprocal average forces).

In the analysis of odontometric and cephalometric indices correlations, the following distribution was established: with the dental arc parameters in the front plane, the mesiodistal dimensions of the crown of the teeth (77-53.5% of the total number of these indicators, of which 9.0% of direct strong, 21.5% direct average forces, 22.2% of unreliable direct average forces, 0.7% of false reciprocal average forces); the vestibular-tongue size of the crown of the teeth (73 - 50.7% of the total number of these indicators, of which - 6.3% of direct strengths, 13.9% of direct mean strength, 29.2% of false direct average forces, 1.4% unreliable reciprocal average strength); the length of the teeth (36-30.0% of the total number of indicators, of which - 2.5% of direct average strength, 22.5% of unreliable direct average strength, 0.8% of reciprocal average strength, 4.2% of false reverse middle force); the width of the dentin-enamel border in the mesiodistal direction (23 - 31.9% of the total number of these indicators, of which - 4.2% of direct strengths, 4.2% of direct mean strength, 19.4% of false direct middle forces, 1, 4% of reciprocal average strength; 2.8% of unreliable reciprocal average strength); the width of the dentin-enamel border in the vestibular-tongue direction (39-54.2% of the total number of these indicators, of which 2.8% of direct strengths, 18.1% of direct average forces, 31.9% of unreliable direct mean forces; 1.4% of false reciprocal average strength); the length of the root in the vestibular-tongue projection (13 to 18.1% of the total number of these indicators, of which 1.4% of direct strengths, 1.4% of direct mean strength, 8.3% of false direct middle forces, 1.4 % of reciprocal average force; 5.6% of unreliable reciprocal average strength); the length of the root in the mesiodistal projection (13-18.1% of the total number of these indicators, of which 6.9% are false direct average forces, 2.8% of the reciprocal average force, 8.3% of the false reciprocal average forces); cephalometric indices (87 - 20.7% of the total number of these indicators, of which 0.2% of direct strengths, 5.0% of direct average forces, 14.5% of false direct average forces, 1.0% of unreliable reciprocal average forces) with the parameters of the maxillary dental arches in the sagittal plane, mesiodistal dimensions of the crown of the teeth (29-80.6% of the total number of these indicators, of which 19.4% are direct strong, 30.6% direct average strength, 30.6% false straight lines medium strength); vestibular-tongue size of the crown of the teeth (30-83.3% of the total number of these indicators, of which - 16.7% of direct strengths, 25.0% of direct average strength, 41.7% of false direct middle forces); length of teeth (12 - 40,0% of the total number of these indicators, of which - 6.7% of direct average strength, 33.3% of false direct average forces); the width of the dentin-enamel border in the mesiodistal direction (13-72.2% of the total number of these indicators, of which 11.1% are direct forces, 27.8% direct average strength, 33.3% are false direct average forces); the width of the dentin-enamel border in the vestibular-tongue direction (13-72,2% of the total number of these indicators, of which 38,9% of direct average strength, 33,3% of the false direct middle forces); the length of the root in the vestibular-tongue projection (3 - 16.7% of the total number of these indicators, of which 11.1% are false direct average forces, 5.6% are unreliable reciprocal average strength); the length of the root in the mesiodistal projection (2 - 11.1%

of the total number of these indicators, all unreliable direct mean power); cephalometric indices (18-17.1% of the total number of these indicators, of which 2.9% of direct average strength, 14.3% of false direct average forces). With the parameters of the maxillary dental arc in the vertical plane, mesiodistal dimensions of the crown of the teeth (8 - 22.2% of the total number of these indicators, of which 5.6% of direct average strength, 16.7% of false direct average forces); vestibular-tongue size crowns of teeth (3 - 8,3% of the total number of these indicators, of which - 2.8% of direct strengths, 5.6% of false direct middle forces); length of teeth (5 - 16.7% of the total number of indicators, of which - 6.7% of false direct average forces, 3.3% of reciprocal average strength, 6.7% of false reciprocal average forces); the width of the dentin-enamel border in the mesiodistal direction (1 - 5.6% of the total number of these indicators, all unreliable direct mean strength); the width of the dentin-enamel border in the vestibular-tongue direction (7 - 38.9% of the total number of these indicators, of which - 16.7% of direct average strength, 22.2% of false direct average forces); the length of the root in the vestibular-tongue projection (5 to 27.8% of the total number of these indicators, of which 11.1% are false direct middle forces, 5.6% of the reciprocal average strength, 11.1% are unreliable reciprocal average forces); the length of the root in the mesiodistal projection (3-16.7% of the total number of these indicators, of which 5.6% are false direct average forces, 5.6% of the reciprocal average force, 5.6% of the unreliable reciprocal average strength); cephalometric indices (36 - 34.3% of the total number of indicators, of which 0.9% of direct strong, 11.4% of direct average strength, 20.0% of false direct average forces, 1.9% of unreliable reciprocal average forces). In contrast to the general group of young men with orthognathic bite [15] when split into different craniotypes, in brachycephals draw attention to an increase in the percentage of inverse ties of the transversal dimensions of the upper and lower jaw with practically all dental dimensions (correspondingly 2.1% in the general group and 31 , 8% for brachycephals) and an increase in the percentage of back connections of maxillary dental arch parameters in the vertical plane with the length of the teeth (respectively 0 and 10.0%) and with the length of the root in the vestibular-tongue (correspondingly 5.6 and 16.7%) and mesiodistal (correspondingly 0 and 11.2%) projections. A number of studies have also proved the existence of bundles of teeth sizes and dental arches with other parts of the dento-jaw system and cephalometric indexes and the skull in general [11-13, 17, 23]. Differences in the strength of the connections are explained by the phylogeny, ontogenetic and morpho-functional unity of the dental arch with other parts of the dento-jaw system [5, 7].

Conclusion

1. In brachycephalic youths with orthognathic occlusion among the linear sizes necessary for the construction of the correct form of the dental arch, the relative majority of predominantly direct mean forces, correlations with the size of the teeth and cephalometric indices are established with the parameters of the maxillary dental arch in the sagittal plane (43.0%), and the smallest - with the parameters of maxillary dental arc in the vertical plane (24.4%). With the transversal dimensions of the upper and lower jaw, the relative number of such correlations is 32.3%.

2. In brachycephalic young men, the relative majority of reliable and mean strength of false correlations of the transversal dimensions of the upper and lower jaw are established with mesiodistal (53.5% of the total number of links between these indices) and vestibular-tongue (50.7%) crowns the teeth and with the width of the dentin-enamel border in the sphincter-language direction (54.2%); the parameters of the maxillary dental arch in the sagittal plane - with mesiodistal (80.6%) and vestibular-tongue (83.3%) with the size of the crowns of the teeth and with the width of the dentin-enamel border in the mesiodistal (72.2%) and vestibular-tongue (72,2%) direction; parameters of the maxillary dental arc in the vertical plane - with the width of the dentin-enamel border in the vestibular-tongue direction (38.9%) and with cephalometric indices (34.3%).

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Реферати

ЗВ'ЯЗКИ ТРАНСВЕРЗАЛЬНИХ РОЗМІРІВ ВЕРХНЬОЇ Й НИЖНЬОЇ ЩЕЛЕПИ ТА САГІТАЛЬНИХ ХАРАКТЕРИСТИК ЗУБНОЇ ДУГИ З ОДОНТОМЕТРИЧНИМИ Й КЕФАЛОМЕТРИЧНИМИ ПОКАЗНИКАМИ ЮНАКІВ-БРАХІЦЕФАЛІВ ІЗ ОРТОГНАТИЧНИМ ПРИКУСОМ

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В статті описані і проведено аналіз кореляції комп'ютерно-томографічних характеристик зубних дуг з одонтометричними й кефалометричними показниками юнаків-брахіцефалів із ортогнатичним прикусом. Відносна більшість переважно прямих середньої сили, кореляцій лінійних розмірів необхідних для побудови коректної форми зубної дуги з розмірами зубів та кефалометричними показниками у юнаків-брахіцефалів встановлена з параметрами верхньощелепної зубної дуги в сагітальній площині (43,0 %), а найменша – з параметрами верхньощелепної зубної дуги у вертикальній площині (24,4 %). Із трансверзальними розмірами верхньої і нижньої щелепи відносна кількість подібних кореляцій складає 32,3 %. Найбільша кількість кореляцій розмірів зубів з трансверзальними розмірами верхньої і нижньої щелепи встановлена з мезіодистальними (53,5 % від загальної кількости зв'язків між даними показниками) і присінково-язиковими (50,7 %) розмірами коронок зубів та з шириною дентинно-емалевої межі у присінково-язиковому напрямку (54,2 %); з параметрами верхньощелепної зубної дуги в сагітальній площині – майже зберігається подібний розподіл (80,6 % з мезіодистальними розмірами коронок зубів, 83,3 % з присінково-язиковими розмірами коронок зубів, 72,2 % з шириною дентинно-емалевої межі у присінково-язиковому напрямку, 72,2 % з шириною дентинно-емалевої межі у мезіодистальному напрямку); з параметрами верхньощелепної зубної дуги в вертикальній площині спостерігається зовсім інший розподіл – найбільша кількість кореляцій встановлена лише з шириною дентинно-емалевої межі у присінково-язиковому

СВЯЗИ ТРАНСВЕРЗАЛЬНЫХ РАЗМЕРОВ ВЕРХНЕЙ И НИЖНЕЙ ЧЕЛЮСТИ И САГИТАЛЬНЫХ ХАРАКТЕРИСТИК ЗУБНОЙ ДУГИ С ОДОНТОМЕТРИЧЕСКИМИ И КЕФАЛОМЕТРИЧЕСКИМИ ПОКАЗАТЕЛЯМИ ЮНОШЕЙ-БРАХИЦЕФАЛОВ С ОРТОГНАТИЧЕСКИМ ПРИКУСОМ

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В статье описаны и проведен анализ корреляций компьютерно-томографических характеристик зубных дуг с одонтометрическими и кефалометрическими показателями юношей-брахицефалов с ортогнатическим прикусом. Относительное большинство, преимущественно прямых средней силы, корреляций линейных размеров необходимых для построения корректной формы зубной дуги с размерами зубов и кефалометрическими показателями у юношей-брахицефалов установлено с параметрами верхнечелюстной зубной дуги в сагитальной плоскости (43,0 %), а наименьшее количество – с параметрами верхнечелюстной зубной дуги в вертикальной плоскости (24,4 %). С трансверзальными размерами верхней и нижней челюсти относительное количество подобных корреляций составляет 32,3 %. Наибольшее количество корреляций размеров зубов с трансверзальными размерами верхней и нижней челюсти установлено с мезиодистальными (53,5 % от общего количества связей между данными показателями) и преддверно-языковыми (50,7 %) размерами коронок зубов и с шириной дентинно-эмалевой границы в преддверно-языковом направлении (54,2 %); с параметрами верхнечелюстной зубной дуги в сагитальной плоскости – практически сохраняется подобное распределение (80,6 % с мезиодистальными размерами коронок зубов, 83,3 % с преддверно-языковыми размерами коронок зубов, 72,2 % с шириной дентинно-эмалевой границы в преддверно-языковом направлении, 72,2 % с шириной дентинно-эмалевой границы в мезиодистальном направлении); с параметрами верхнечелюстной зубной дуги в вертикальной плоскости наблюдается совсем другое распределение – наибольшее количество корреляций установлено лишь с шириной дентинно-эмалевой

напрямку (38,9 %) та з кефалометричними показниками (34,3 %).

Ключові слова: юнаки-брахіцефали з ортогнатич-ним прикусом, кореляції, кефалометричні показники.

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границы в преддверно-языковом направлении (38,9 %) и с кефалометрическими показателями (34,3 %).

Ключевые слова: юноши-брахицефалы с ортогнатичес-ким прикусом, корреляции, кефалометрические показатели.

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PECULIARITIES OF RHEOVASOGRAPHY PARAMETERS OF THE SHIN IN VOLLEYBALL PLAYERS, WRESTLERS, ATHLETES OF MESOMORPHIC SOMATOTYPE

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Changes in time, amplitude and derivative of the rheovasograms of the shin in the adolescent athletes of a high level of skills who have been engaged in volleyball, athletics and wrestling with at least three years of sports have been determined. The control group was made up of almost healthy individuals aged 17-21 years. It was established that volleyball players, athletes and wrestlers of mesomorphic somatotype had significant differences in the size of the rheovasographic parameters of the shin between themselves and in comparison with those of the same constitutional type who were not engaged in sports. Sport specialization, which predetermined the features of muscular activity, to a greater extent than belonging to a separate constitutional type, led to changes in the regional circulation in the shin at representatives of different sports types.

Key words: shin rheovasography, mesomorphic somatotype, volleyball players, athletes, wrestlers.

The paper is a fragment of RSW "Features of the indices of hemodynamics, depending on the parameters of the body structure in athletes of different sports" (State registration number 0115U004045).

The factor limiting the growth of sports achievements in many sports types is the complex of morphofunctional indices of the cardiovascular system. Sufficient regional blood circulation provides an important part in solving this problem, because adequate blood supply to working muscles, which during intense physical activity increases in dozens of times, makes it possible to complete a full range of training and competition programs [1, 13]. A large number of scientific studies in this area confirms the indisputable relevance of determining the features of peripheral hemodynamics in representatives of various sports [2, 5, 8, 17]. In addition, an individual inhomogeneity of elements of peripheral circulation was established, which was determined by the constitutional characteristics of the human body [4, 6, 15]. Publications in which hemodynamic parameters of athletes of different sports and their belonging to certain somatotypes were studied are unfortunately in small number [14, 16].

The purpose of the paper was to establish changes in the time, amplitude and derived indices of the shin rheovasography in volleyball players, wrestlers and athletes who belonged to the mesomorphic type of the constitution.

Material and methods. We conducted a comprehensive survey of young athletes aged 17 to 21 years of high level of athletic skill (from the first adult level to masters of sports), namely, 60 volleyball players, 88 athletes and 61 wrestlers. The control group consisted of 74 males, who were not engaged in sports and at the time of the survey were almost healthy. The rheovasographic parameters were determined using a computer diagnostic complex. The estimation of the quantitative parameters was carried out according to time, amplitude and derivatives using the Ronkin and Ivanov's method [12]. The determination of somatotypes was carried out according to the estimated modification of the Heath-Carter method [3].The somatotypological analysis showed that the greatest number of athletes and controls belonged to the mesomorphic type of constitution: 32 volleyball players, 40 wrestlers, 51 athletes, 25 non-sportsmen. The statistical processing of the results was carried out using the package "STATISTICA 5.5" (license number AXXR910A374605FA). The nature of the distributions for each of the received variation series was evaluated by the Shapiro-Wilk test, the mean and standard quadratic deviations for each sign and the validity of the difference in values were determined by the Man-Whitney U-test.

Results and discussion. We have established the marked differences in the size of the indices of the rheovasography of the shin between representatives of various sports and non-athletes [10] and athletes of different constitutional types [9]. Therefore, we compared the size of the parameters of peripheral hemodynamics on the example of the shin in the representatives of one somatotype, which differed in terms of motor activity and the peculiarities of sports activity. Most of the amplitude indices of the rheogram of the shin