

MORPHOLOGICAL STATE OF WRESTLERS WITH EVALUATION OF SPORTS SPECIALIZATION

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ABSTRACT

Categories of somatotypes of athletes specializing in various types of wrestling are established by the methods of anthropometry and by Hit-Carter method. Results of anthropometric parameters showed that somatic state of athletes engaged in various types of wrestling are differed. Similarity was found in constitution of wrestlers specializing in weightlifting, freestyle wrestling and national sport kurash, and endomesomorphic somatotype was determined in 67-83% of athletes, that calculating by points is expressed as 3.3:6:2. Ectomesomorphic somatotype dominated among judoists and sambo wrestlers and components of body mass were presented as 3,3: 5,4: 2,2 and 2.9: 5.4: 2.3 respectively. Dynamic observation showed that athletes with balanced-mesomorphic somatotype possess wide adaptation ability, providing an effective rearrangement of morphotype under the influence of training modes of different orientation.

Keywords: Relevance, variability, wrestling, integral, characters, transverse, empirical, respectively, length, somatotype, balanced, comparative, fact, category.

The relevance of research: Parameters of body type occupy an important place among factors influencing sport activity. Variability of body size depend on age, profession and they could be of selective significance in sport [(1,6,8)]. Somatotype as an integral characteristic of the athlete morphological organization, is a marker of motor and some functional capabilities of the organism. Genetic and environmental factors influence somatotype formation [2. 9,]. In this connection one of the most important environmental factors is the purposeful sports activities forming adaptive somatotype of an athlete of specific specialization [3, 6, 7, 12]. Analysis of morphological characters should be conducted in various aspects: 1. analysis of morphologic characters during process of individual development taking into consideration critical and sensitive periods of development; 2. tracing the formation of a certain body type under the influence of training, characteristic for a certain sport specialization, or the use of morphological features for the purposes of athletic selection and orientation. Condition of physical development of athletes is characterized by a number of anthropometric signs. There are single data on a possibility of significant changes not only in the component composition of the body, but also in the type of constitution, possibility of goal-directed changes of junior constitution as a result of practicing a certain sport [4].

In this regard, the task was set: to find out morphological differences among representatives of the different specialization, in particular in various kinds of wrestling, to study somatotypes variations, changes in the composition of the body mass of wrestlers, depending on the different orientation of the training regimes in the course of long-term dynamic observations.

The following research methods were used:

Anthropometric studies: Estimation of physical development of athletes was carried out by the methods of anthropometry. Anthropometric studies were conducted according to the

methods described in the manual of E.G. Martirosov (1982) [5] and using standard tools. The athletes under examination represented an ethnically homogeneous group, as medical and biological approach to the problem of sport orientation and selection assumes consideration the individual characteristics of a person, formed on biological prerequisites, having a genetic basis. Athletes specialized in power sports: weightlifting (35 athletes) and 5 types of wrestling (153 athletes). In total 288 athletes were under examination. Total sizes, as well as partial: longitudinal, transverse, girth of the trunk, head, neck, segments of the upper and lower extremities were measured. The thickness of the skin-fat folds was measured in 4 parts of the body: under the scapula, in the upper iliac region, on the posterior surface of the shin and shoulder. Main anthropometric parameters and mean square deviation were calculated.

Type of constitution, detected by the Hit-Karter method, 1989 [11, Carter J.L.], is one of universal methods of somatotypology as it is characterized by common quantitative approaches for the determination of variants of constitution in people of all nationalities and races, of any age and sex. The Hit-Carter scheme is universal also because it is based on 7 anthropometric features and covers the entire empirical set from minimum to maximum values and the principle of approach to the construction of tables. It means that results obtained in examination of athletes of various specialization, are comparable as well as data obtained in athletes at the period rehabilitation and during active training. Besides this scheme has become very popular in foreign studies, i.e. there is the opportunity to compare own research with research conducted in other laboratories.

Standard measurements were originally conducted as detection of length of the body, diameter of the distal part of the shoulder, thigh, shoulder circumference in the stressed state, shin circumference, and the caliper measurements of the skin-fat folds in 4 regions of the body were also carried out.

Somatotype was diagnosed on the basis of three components: I IF is the fat component of endomorphism; II M - muscular component - mesomorph; III -Ectomorphy - P/L -weight-growth index. In the process of dynamic observations after 2 years of occupation by the selected sport, detection of the component composition of the body mass with the subsequent diagnosis of the somatotype was performed.

RESULTS AND DISCUSSION

Analysis of obtained results showed that in athletes engaged in strength sport, freestyle wrestling, kurash, Greco-Roman wrestling, the length of the body is approximately the same: $175.72 + 0.62$ (freestyle wrestling), $175.30 + 2.52$ (kurash), $175.44 + 1.08$, (Greco-Roman), $175.44 + 1.08$ (weightlifters), respectively, exception was presented by judoists (Table 1). However in spite the similar body length, body mass varied in all kinds of sport. the mean square deviation ranged from 7.99 to 11.04.

High variability in chest circumference was established for freestyle wrestlers, whose standard deviation was 9.89, for sambo wrestlers -6.54 and for weightlifters -6.86.

A similarity in the proportions of the body is established. The most stable were partial long lengths: the length of the shoulder, the forearm, the shin, the circumference of the head, neck, shin, shoulder width. Variability is revealed in the dimensional characteristics of the wrists – the range in the mean square deviations was from 1.20 to 9.90.

Evaluation of the dimensions of fat folds in the compared groups showed uniformity in the quantitative distribution of the subcutaneous fat layer, except for the thickness of the fat fold under the scapula. In weightlifters the thickness of the fold was $9.05 + 2.39$, for wrestlers this value was $7.96 + 2.33$. Intergroup variability is found in the parameters of the abdomen. This parameter in weightlifters amounted to $81.80 + 3.9$ cm, for freestyle wrestlers $-79,40 \pm 0,71$, for sambo wrestlers $-83,20 \pm 1,43$, for Greco-Roman wrestlers $-78,00 \pm 0,42$, for kurash wrestlers $-75,40 \pm 1,10$. Differences in length of the hip and width of the pelvis were also revealed. So weightlifters are characterized by a larger pelvic width than wrestlers, which is associated with the specificity of training, in particular, with the development of a "low sub" under the bar. Analysis of morphometric characteristics of wrestlers in 5 kinds of wrestling was carried out. Differences in mean square deviation values are revealed. Thus, the circumferential dimensions of the abdomen, shoulder, hand, hip in specialization types under consideration repeat properties of intergroups distribution.

The range of variation of features is characteristic for indices of length of the forearm, shin, neck circumference, diameters of the middle chest, apical joint, thickness of the fat fold on the posterior surface of the shoulder (Table 1). Probably these signs are more affected by the specificity of sports specialization, the character of the training regimes, choice of a specific arsenal of attacking technical actions.

Analysis of somatypes categories demonstrated domination of ecto-mezomorphic type among judoists and sambo wrestlers (33.4-41.7%). An equal distribution of two somotypes is observed in classic wrestlers: ecto-mesomorphism and balanced mesomorphy occurred in 50% and 41,76% of cases, respectively. Calculation of the main somatype components by points showed dependence on the specifics of the specialization. Thus endo- and mezomorphic components achieve the maximal development in free style wrestlers (3,3: 6,0:2,1), less values were detected in wrestlers engaged in kurash and sambo: 3,3: 5,4: 2,2; 2,9: 5,4: 2,3 respectively. Contrary to the popular opinion that intensive sport exercises contribute to maximal fat decrease in an organism, there is convincing evidence that for representatives of some kinds of sports, in particular, for wrestlers and weightlifters, the amount of fat can be quite large, since fat is the main energy potential. Higher values of ectomophic component are typical for classic wrestlers, in which the average values of the somatype in points are 2.8: 4.6: 2.7. Obtained results indicate that degree of similarity and differences in values of anthropometric parameters depend on the nature of the sign.

Comparative analysis of wrestlers somatotyping in 2 years allowed to establish the maximal differences in degree of metamorphic component expression. Minor differences were identified in indices of endomorphism. Registration of category of somatypes revealed the following:

at the initial stage category of endomorphic type of wrestlers amounted to 65.2%, and in 2 years this value achieved 82.6% at the expense of transition of balanced mezomorphic type into endo-mezomorphic type.

Somatic polymorphism is observed in wrestlers who have even insignificant differences at the level of athletic skill, and changes in somatypes are noted in athletes whose adaptive capabilities provide an effective morphotypic restructuring, more optimal for the selected sport. Such differences among athletes who specialize in different types of wrestling are not only determined by technical and tactical expediency, but they are also connected with the morphological prerequisites of development.

The revealed facts once again confirm the influence of exogenous factors on the program of individual ontogenetic development. In this case, the influence of the exogenous factor is realized through the improvement of motor, speed-strength qualities in the direction necessary for a particular sport. The orientation of the training process, the change in the technique of motion even within the same specialization, leads to a sharp alterations in the component composition of the body, which ultimately leads to a change in the category of the somatotype.

CONCLUSION

1. Somatotype polymorphism among athletes specializing in 5 types of wrestling was established.
2. Endo-mesomorph category dominated in athletes engaged in free style wrestling, kurash and weightlifters. Ecto-mesomorphic type was to a large extent represented by Sambo wrestlers and judoists. Endo-mesomorphic and balanced-mesomorphic types were revealed in free style wrestlers
3. Athletes with balanced - mesomorphic types have wide adaptive capabilities that ensure the effective restructuring of the morphotype under the influence of training regimes of different directions.
4. Somatic states are differed in athletes engaged in various kinds of wrestling and they can be considered as separated classes.

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Table 1: Intragroup variability of total body sizes in wrestlers of various specializations

		Free style wrestlers n=131	Sambo wrestlers n=22	Greco- Roman wrestling n=37	Kurash n=23	Judo n=40
Length Bodis	M \pm M(sm)	175,72 \pm 0,62	173,95 \pm 1,92	175,30\pm 2,52	175,44 \pm 1,08	173,38 \pm 1,31
	Mean square deviation	7,05	9,04	8,39	4,57	5,58
Body mass	M \pm M(sm)	69,72 \pm 0,96	70,53 \pm 2,31	69,60 \pm 2,89	67,83 \pm 1,88	67,44 \pm 1,30
	Mean square deviation	11,04	10,83	9,60	7,99	5,82
Chest circumference	M \pm M(sm)	93,50 \pm 0,86	98,00 \pm 1,39	95,67 \pm 0,57	91,20 \pm 1,34	93,24 \pm 0,70
	Mean square deviation	9,89	6,54	1,80	5,67	3,15