AJSIHD
GLOBAL RESEARCH NETWORK

AMERICAN Journal of Science on Integration and Human Development
Volume 2, Issue 4, 2024 ISSN (E): 2993-2750

Comparative Assessment of Morpho-Physiological, Functional Features of Volleyball Players, Taking into Account Their Playing Role

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Abstract: Morphological differences in the physique of volleyball players depending on the playing role have been established. Taking into account that longitudinal dimensions for players have a decisive role requiring prediction at the stage of early sports selection, we set the task to identify specific genetic markers predicting the limits of growth processes. In order to predict the growth rate of longitudinal body sizes in volleyball and basketball players we used anthropometry methods and methods of genetic HLA typing, which allowed us to identify specific genetic markers associated with this or that body length. The participation of cardiorespiratory system as an informative indicator of athletes' physical performance, aerobic capacity, and also as a system reflecting the level of adaptability of athletes' organism was established. The use of functional approach allowed to identify promising volleyball players. The morpho-kinesiological analysis of the phases of jumping action with the evaluation of the performed work was carried out. The phase of jumping down, which is regarded as a type of yielding work, is analyzed, then comes the amortization phase, in which there is a forced stretching of muscles, then comes a sharp contraction of muscles and comes the phase of pushing off and the subsequent jumping forward. There is a clear characterization of the main muscles providing push-off, which at this point perform overcoming work.

Keywords: self-government bodies of citizens, civil society, welfare of the population, social protection, laws and regulations, cultural development, national traditions, patriotism.

Relevance: At the present stage of the development of game sports, there is a need not only for theoretical, but also for practical justification of the requirements for the organization and conduct of the training process. One of the trends in modern sports is associated with the introduction of new training methods that are effective, and any changes in the training methodology are aimed at improving athletic performance. Secondly, in many sports, there have been changes in the conditions and rules of competitions, improvement of equipment, equipment of special equipment; thirdly, an increase in the volume of training work, to which rapid and effective adaptation is required. It is necessary to point out the use of new techniques that enhance physical performance and functionality.

The level of study of the problem: In the modern system of sports training in game sports, and in particular in volleyball, differentiated training tasks are necessary, taking into account the individual current level of fitness, the motor potential of the player and his game specialization. The theoretical justification of the requirements is reduced to planning and differentiation of loads, as well as to the correct organization of the training process for the preparation of athletes, including volleyball players [1; 2; 3; 4;].

In game sports, special requirements are imposed on the level of preparedness of volleyball players, in particular, not only to their general physical, special physical, technical and tactical training, but require taking into account the peculiarities of their morphological, functional, biomechanical and technical indicators. This requires competent, adequate use of the test system, which should be based on the opinions of leading and recognized experts, and take into account the individual characteristics of volleyball players, taking into account their playing role in the team. [5; 7; 9;]. Technical readiness, which is determined by the level of development of an athlete's ability to perform certain motor actions in form and intensity; [2; 7; 16; 18;]. Recently, it has been more clearly realized that sports training, the ultimate goal of which is to achieve the highest sports result, is aimed at developing the level of functional capabilities of the athlete's body capable of providing this result. In relation to sports, "functional fitness" is formulated as the level of coherence of the interaction of mental, neurodynamic, energetic and motor components organized by the cerebral cortex and aimed at achieving a given athletic result, taking into account a specific sport and the stage of athlete training" [6; 9; 14; 16;]. The search for objective criteria for determining the functional state of athletes at different stages of the training process, achieving optimal readiness or peak fitness for competitions remain relevant to the present time, which was the justification for this study.

The purpose of the study: Comparative assessment of morpho-physiological, functional features of volleyball players, taking into account their playing role.

The object of the study were volleyball players, pupils of the Karshi Olympic Reserve School, who have the sports qualification of candidates for the Master of Sports (CMS), aged 16-17 years.

Research methods: A research plan was developed to assess physical development, assess the functional state of volleyball players with the identification of reserve capabilities based on anthropometric, genetic and physiological research methods. A morpho-kinesiological analysis of jumping actions was carried out. The assessment of physical development was carried out on the basis of anthropometric measurements, taking into account the playing role of volleyball players [11, 12]. Genetic studies have been conducted in order to establish the relationship between an informative anthropometric feature for gamblers as body length with an absolute genetic marker as the HLA system. HLA typing was carried out according to the method of Zaretskaya Yu.M., V.Yu.Abramov, 1986 [8]. Identification of HLA antigens was performed in a lymphocytotoxic test with antiserum obtained from the Republican Center for Immunological Tissue Typing at C.St. Petersburg Research Institute of Hematology and Blood Transfusion. In order to avoid errors, during typing, each antigen was identified by a "battery" consisting of 2-9 antisera. The principle of the method is a two-stage effect on peripheral blood lymphocytes with antiserum and complement. Antigens of HLA loci were detected-A, B, C, Cw, DR. The frequency of HLA antigen loci was calculated using the formula f = N/n, where n is the number of individuals with this antigen, N is the total sample size. The antigen frequencies were determined by the formula p = I - I –A; where p is the frequency of the allele, and A is the frequency of the corresponding antigen. The x2 value was calculated using the formula x2 = (f - f1)2 : f1- where f and - f1 are, respectively, the observed and expected frequency of the phenotype. During the implementation of this section, methodological and advisory assistance was provided by senior researcher of the NIIEMIZ of the Republic of Uzbekistan, Candidate of Biological Sciences, A.P. Shimolin.

The assessment of the functional state was carried out on the basis of the cardiorespiratory system – as an integral and informative indicator of the physical performance of athletes, as a system reflecting the level of adaptability of the athletes' body, as well as the level of their aerobic capabilities [6]. Functional indicators such as physical performance, determined by the PWC-170 test, vital capacity of the lungs, MPC – maximum oxygen consumption, IOC – minute volume of blood circulation were used. The actual material obtained during the study was processed using the methods of mathematical statistics generally accepted in sports pedagogy

with the calculation of arithmetic averages (M), mean square deviations (σ), arithmetic mean errors (m). The reliability of the differences in the average values was determined by the Student's t-criterion. The methods of mathematical statistics were used according to the recommendations set out in the manual Tolametova A.A., Akhmedova A., 2010 [15].

The results of the study and their discussion: Given that volleyball belongs to team sports, we set the task to establish a difference in body features between players who differ in playing roles. We have identified among the volleyball players the players who perform the roles of forwards, defenders or libero and corners in the team. Morphological measurements were carried out for total and some partial sizes significant for volleyball (Tables 1,2). The analysis of the long body dimensions showed that the defenders, whose body length is - 176.6±5.55 cm with a weight of - 66.4±9/43kg, MRI is 354.1±42.23. For attackers, the body length is - 181.8±5.9 cm, for cornerbacks - 181.1±4.97 cm. By body weight, the most massive corners and attackers, so,

role	Body weight	Body length	MRI is a mass-growth feature	Arm Length	Leg length	Shoulder Length
Corner	73.5±8.38	181.1±4.97	405.2±38.27	80.9±1.89	90.1±3.8	43.8±2.12
libero	66.4±9.43	176.6±5.55	354.1±42.23	80.9±3.83	87.5±1.31	40.9±1.73
The striker	73,3±6.74	181,8±5.9	400.1±34.16	81.9±3.44	88.9±4.67	42.4±1.19

Table 1. Comparative assessment of the physical development of volleyball players of various playing roles

the angular body weight was 73.5±8.38 kg, and the attackers - 73.3±6.74 kg, and the MRI–mass-height index for the corners was 405.2±38.27g/cm;, the attackers - MRI was 400.1±34.16g/cmSee that is, no significant differences in body weight and length were found in volleyball players of playing roles – forwards and corners (Table.1) Low body length (-170 cm) and mass-height index (MRI) were found in (libero) defenders. The analysis of the long–legged dimensions of the upper and lower limbs revealed the following: the length of the upper limbs of volleyball players of various playing roles - the longest–armed attackers - 81.9 ± 3.44, then the same value of the upper and lower limbs was established for libero and corner 80.9 ± 1.31 cm. Relative to the lower limbs, the longest–legged ones are angular, in which the length of the lower limbs is -90.1 ± 3.8, then for attackers - the length of the leg is - 88.9 ± 4.67 cm, and for defenders – 87.5 ± 4.67 cm. .Attention should also be paid to shoulder width – the widest shoulders are angular -43.8± 2.12cm; forwards - 42.4±1.19cm and then for defenders - 40.9±1.73cm.

Considering that in sports games, in particular, in volleyball and basketball, the decisive indicator for success in a chosen sport is body length, we compared two groups of players diametrically opposed on this basis – with a body length of 160-170 cm and a group of athletes with a body length of 180-190 cm. Predicting body length for the future is the task of early sports selection. To find out whether body length has a hereditary condition, we conducted typing of HLA antigens in athletes specializing in volleyball and basketball, divided into 2 groups. The first group consisted of 84 athletes with a body length of 160-170 cm; the second group consisted of 71 players with a body length of 180-190 cm. We present data on the frequency of occurrence of HIA antigens at loci A and locus B in athletes of game sports with contrasting growth indicators (for example, volleyball and basketball). A high incidence of HIA – A3, HIA – A2 was revealed in athletes of group No. 1 with height indices of 160-170 cm compared with athletes whose height indices were 180-190 cm (group No. 2 – 84 athletes). Of the antigens of the HIA-B locus, the B15 antigen was also found in group No. 1 of athletes with a body length of 160-170 cm, which was completely absent in the group of gamekeepers No.2. In group No. 2 of athletes (81 volleyball and basketball players) with a body length of 180-190 cm, specific genetic markers associated with a specific haplotype HLA-A9 with a frequency of x-0.228, HLA-A28

with a frequency of x- 0.330 were identified; from the HLA B-13 locus complex at x-0.138, HLA B-35 at x- 0.138. The revealed trend characterizes the presence of interrelations between the HLA genetic system and deterministic long-range physique indicators of volleyball and basketball players. In the process of training activities, when preparing volleyball players aged 15-17, it is necessary to pay attention to both general physical and special physical training. When improving the special physical abilities of volleyball players, special attention is paid to the development of speed and strength qualities, in particular, jumping ability.

During the training cycle, accentuated exercises aimed at developing the quality of jumping were used. Such exercises include "jumping off an elevation followed by an upward jump", "jumping into depth followed by jumping forward"; "jumping off an elevation with a small weight and then jumping up after landing". Thus, the exercise "deep jump followed by jumping forward" was subjected to biomechanical analysis. It should be noted that before performing jumps, it is necessary to prevent disorders in the joints of the musculoskeletal system in advance. At each stage of the experiment, it is also necessary to determine the strength of the extensor muscles of the lower extremities by dynamometry. When performing a downward jump, the descent phase occurs first, when the body lands according to the laws of gravity; after landing, the depreciation phase begins. In the shock-absorbing phase, there is a forced stretching of the muscles, then there is a sharp contraction of the muscles and the moment of repulsion comes. At the same time, it is necessary to use the capabilities of the flexor muscles of the toes. The work of the foot muscles in the repulsion phase is characterized by sharpness and strength or is characterized by the so-called "explosive force". This work is more like ballistic work, For a short time the muscles contract as much as possible, the body, thrown forward, goes some distance. The main muscles providing repulsion of the body are the muscles of the plantar surface of the foot, the muscles located around the ankle joint, in the lower leg – the main muscle providing repulsion is the triceps tibia. Repulsion is provided by the muscles located around the hip joint, the extensor muscles of the trunk, as well as the muscles that lift up the upper limb belt. The muscles located on the lower extremities and on the trunk are in a reduced state and at this time they perform inferior work, and at the moment of repulsion - overcoming work. During the microcycle, complexes of this kind of exercises are recommended to be used three times a week, and the exercises should be included after an intensive warm-up, at the beginning of the main part of the lesson. The above exercises are supportive in nature and were performed in two series of five to six repetitions. Repetitions of exercises are carried out under the supervision of a coach, taking into account the well-being of the training athletes. After the main part of the training session, there is a hitch – 5-7 minutes, for rest or time is allocated for relaxation. In this regard, it is necessary to determine the most frequently used physical performance both in the clinic and in sports according to the PWC -170 test, which is expressed in the values of the load power at which the heart rate can reach 170 beats per minute. (beats/min). It is known that the average PWC value of -170 in untrained men reaches 700 – 1100 kg/m, in women – 450 – 750 kg/m [106; 72c]. The volleyball players we examined aged 15-16 had an average PWC score of -170 per kg/m/min, that is, in absolute values it was – 1542.3+450.4 kg/m/min, and in relative values – 255.94+ 77.2 watts. The analysis of the results of the study showed that the highest indicators of physical performance were established for Holov A. - PWC -170 was - 2472.1 kg/m/min – (412.0 watts), for Sean O. – 2183.8 kg/m/min or (363.9 watts). then they have a maximum of 2049.1 kg/m/min or (343.5 watts) (Table 2).

№	Full name	Load capacity I	Load capacity II	PWC170 kg/m/min	PWC 170 watts	MPK -U			DC brushes	
						ABS	Related	Mark	Right	left
1	Uralov Sanjar	1016,9	1068,1	1095,2	153	3,369	50,2	low	50	50
2	Juraev Samar	1006,3	1118,2	**1465,3**	244,2	4,147	64,8	good	36	38
3	Fayziev Said	964,4	1034,3	1370,4	228,4	3,947	61,7	good	40	34
4	Kholdarov Asil	**668,3**	**1297,2**	**2472,1**	**412,0**	**6,261**	**86,9**	**Exc**	40	41
5	Uzokov Sobir	933,6	995,9	1035,1	172,5	3,243	56,9	med	34	30
6	Otkirov Odil	1238,3	1397,5	**1443,6**	240,6	4,101	50,6	low	40	42
7	Xoliqov Nurbek	924,9	993,7	1282,6	213,7	3,763	53,7	low	44	43
8	Dolgix Artem	1202,0	1408,6	**2049,1**	341,5	5,372	62,5	good	40	42
9	Eshboyev Aziz	997,5	1146,6	1208,7	218,4	3,822	54,6	low	40	40
10	Anayev Ramazon	1223,0	1467,6	**1467,2**	244,6	4,302	68,1	good	40	40
11	Shonazar O	873,6	1397,7	2183,8	363,9	5,65	83,4	exc	38	38
12	Xakberdiyev E	1010,0	1252,5	**1434,3**	239,0	4,082	55,1	low	37	34
$\bar{x} \pm \sigma$		**1004,9±160,9**	**1214,8±176,2**	**1542,3±450,4**	**255,94±77,2**	**4,338±0,93**	**62,4±12,02**		**39,9±4,06**	**39,3±5,16**

Table 2. Assessment of physical performance and aerobic capabilities of volleyball players

The second group of volleyball players consisted of An-ev R. – 1467.2 kg/m/min or (244 watts), Utk-ov O. – 1443.6 or (240.6 watts). For the rest of the volleyball players, the values - PWC - 170 range from 1095.2 kg/m/min.

According to the MPC index, the highest aerobic values were set for Col. A. with MPC - 86.9ml/kg/min, for Shon-va O. - 83.4 ml/kg/min; high aerobic capabilities were demonstrated by An–va R. - 68.1 ml/kg/min,; Uralov S - 64.8ml/kg/min, their volume is 62.5 ml/kg/min, the volume is 64.8 ml/kg/min. 5 volleyball players had low aerobic capacity for MPC ranging from 550.2 to 54.6 ml/kg/min (Table 2).

Conclusion: Morphological differences have been established in the physique of volleyball players depending on the playing role. Considering that long-legged sizes for athletes have a crucial role, which require forecasting even at the stage of early sports selection, we set the task to identify specific genetic markers predicting the limits of growth processes that cause a particular body length. In order to predict the growth rates of long body sizes in volleyball and basketball players, anthropometry methods and methods of genetic HLA typing were used. . In the group of gaming athletes with a body length of 160-170 cm, haplotypes HLA-A2, with a frequency of occurrence (0.361), HLA-A3 (at 0.328) turned out to be a specific genetic marker. In the group of athletes with a body length of 180-190 cm, specific genetic markers associated with a specific haplotype HLA-A9 with a frequency of occurrence (0.228), HLA-A28 with a frequency of occurrence (0.330) were identified; from the complex HLA B-13 at (0.138), HLA B-35 at (0.138). The established genetic markers predicting the rate of growth processes are of selective importance in the selection process and sports orientation. When assessing the functional state of volleyball players, we selected the most informative cardiorespiratory system. The participation of the cardiorespiratory system has been established – as an informative indicator of the physical performance of athletes, as well as as a system reflecting the level of adaptation of the athletes' body, not only to various physical activities, but also to the effect of various exogenous factors.

This trend indicates that high workload can be a determining factor in changes in the well-being of athletes and they should monitor it in order to adjust the training load in time, which will determine the effectiveness of their performance at competitions [3, 14]. It was found that at the

maximum intensity or volume of the training load, fatigue increased proportionally among qualified volleyball players during the playing season [2].

A morpho-kinesiological analysis of the jumping action – "jumping down with jumping forward" was carried out. The phase of jumping down, which is regarded as a type of inferior work, is disassembled, then comes the cushioning phase, in which there is a forced stretching of the muscles, then comes a sharp contraction of the muscles and a phase of repulsion and subsequent jumping forward. A clear description of the main muscles providing repulsion, which are currently performing overcoming work, is given. These are the muscles located in the lower limb girdle and in the segments of the free lower limbs. Thus, in the first half of the training cycle, each training session had an accentuated character of educating speed and strength qualities (jumping up, long jumps from a place) and physical activity had a developing character. The tasks were completed after an intensive warm-up at the beginning of the main part of the lesson. It should be noted that the development of the quality of jumping is effectively carried out with a combination of inferior and overcoming modes of muscle work, on which the range of motor properties carried out in the joints of the musculoskeletal system depend.

Literature

1. Hayrapetyants.R. – Volleyball / Textbook for higher educational institutions. Vol.: "Zar qalam", 2006, 240 p.
2. Atsuta K.A., Guba V.P., Bulykina L.V., Ananyin A.S. Quantitative parameters of training load in assessing the state of fatigue in volleyball players during the season. /Physical culture of upbringing, education, training No. 3, 2022. - pp.46-47.
3. Guba V.P., Chesnokov N.N. Reserve capabilities of athletes - Moscow, 2008 , "Publishing house "Physical culture" – Monograph, - 150 p.
4. Guba V.P., A.V.Rodin. Modernization of the theory and methodology of sports games // Theory and practice of physical culture No.4, 2010, pp. 16-19.
5. Guba V.P., Bulykina L.V., Kurochkina N.A. Theoretical aspects of planning and organization of technical and tactical training of volleyball players / In the collection. Innovative technologies in the system of sports training, mass physical culture and sports St. Petersburg, October 17-18, 2019, pp. 43-46.
6. Epifanov V.A. - Sports medicine publishing house "GEOTAR-Media" 2006, – 35 p.
7. Zheleznyak Yu.D., V.V. Kostyukov, A.V. Chachin - An approximate program of sports training in the sport "Volleyball" Moscow, 2016, -223 p.
8. Zaretskaya Yu.M., Abramov V.A. "New antigens of human tissue compatibility" M., Medicine, 1986. – 115c.
9. Nikolaeva O.V. "Deceptions and techniques in volleyball" | Nikolaeva O.V. abstract for the academic title of Candidate of Pedagogical Sciences, St. Petersburg University of Physical culture, sports and health named after P.F.Lesgaft- diss. Council D 311.2010.01- 24 p.
10. Ruzikulov B.B. Forecasting the prospects of young football players of various playing roles based on anthropogenetic criteria and indicators of physical fitness / Abstract of the dissertation doct.Philosophy (PhD) in pedagogical sciences 13.00.04 - Theory and methodology of physical education and sports training, 2023,- 64 p.
11. Safarova D.D., Yakubova U.J. - Comparative assessment of the physical development of athletes of game sports. //"Fan – Sportga" - ilmiy – nazariy journal 2009, No. 4, pp. 33-37.
12. Safarova D.D. Sports morphology / textbook " T., "lmiy texnika press axborati" , 2021, - 248 p.

13. Sergienko L.P. Heritability and prognostic significance of morphological features of children in sports selection./ In sat. VII Interd. Scientific. Congr. "Modern Olympic sports and sports for all", M.:, 2003, pp.164-166.
14. Solopov I.N., Shamardin A.A., Chemov V.V. The essence and structure of functional fitness of athletes //Theory and practice of physical culture No.8 2010. - pp. 56-58.
15. Tolametov A.A., Akbarov A. Sport metrology: MOF tinglovchilari uchun.- Tashkent, 2010.- 82b.
16. Filimonova S.I., Averyasova Yu.O., Almazova Yu.B., Ginevaichenko V. Typology of speed and strength endurance based on genetic studies of student teams in game sports //Theory and practice of physical culture No. 3, 2022, pp. 11-13.
17. Fomin V.S. Physiological foundations of training management for highly qualified athletes. Moscow : MOGIFK, 1984.- 64 p
18. Fomin E.V. Structure of special physical fitness of young volleyball players. //Theor. and practical physics. cult., 1987, No. 7, pp. 33-34.
19. Dilbar D. Safarova1*, Nariman Gulyamov2, Bakhrom B. Musaev1, Ozod T. Umarov1 - Features of the distribution of HLA antigens in the Uzbek population and prospects for their use in ethnogenesis and predictive sports selection // European Journal of Research volume 9 issue 1 2024 pages 3-9
20. ISSN 2521-3261 (Online)/ ISSN 2521-3253 (Print) https://journalofresearch.eu.