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The compositional structure of the body of young football players 13-14 years old

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Abstract
Purpose: The data obtained by bio impedance analysis allows us to assess the state of fitness at the examination stage. The differences in each stage of the survey allows us to compare the data and thereby get an idea of the rationality of using the means of the educational and training process and nutrition.
Methods: The survey of football players aged 13-14 years was conducted using "Xiaomi Composition Scale" smart scales, as well as a bio impedance method, a pedagogical experiment, a method of mathematical statistics (arithmetic mean, quadratic mean, coefficient of variation).
Results: The body fat mass averaged 7.2±3.7%, the muscle mass averaged 40.5±6.1 kg. The percentage (%) of total water is of the greatest importance, on average it was 60.4%, the main metabolism was 1341.3±120.7 kcal, and the percentage of protein was X=23.2±3.2% with a high significance (15%).
Conclusion: The coaching staff of boys aged 13-14 should apply diagnostics using Xiaomi Composition Scale 2 smart scales. In accordance with the data of bio impedance analysis, a training program for football players is being compiled, there is a certain deficiency in metabolism, for which it is necessary to improve nutrition. This is the amount of energy consumed by the body per day to maintain its basic vital functions: maintaining body temperature, breathing, blood circulation in conditions of basic metabolism.

Keywords: Bio impedance method, young football players, morphological model, obesity diagnosis, in-depth specialization, body weight, body length.

Introduction

In the Republic of Uzbekistan, special attention is paid to the development of children's sports. Sports development of students is a priority area of state policy. In order to achieve high sports results in football, the President and the Government of the Republic of Uzbekistan have adopted a number of Decrees and Resolutions on the development of football and the training of gifted young men for major league teams. Decree of the President of the Republic of Uzbekistan dated December 4, 2019 № PD-5887, Decree of the President of the Republic of Uzbekistan dated March 16, 2018 № PD-3610 "On measures for the further development of football". In this regard, the urgent task of the current stage of the development of youth football is to increase the effectiveness of the educational and training process based on the use of scientifically based methods and tools in the preparation of promising young football players. For high-quality training of young athletes in various sports and countries, the method of studying the compositional composition of the body is widely used, which allows to assess the functional state, determine the diet and monitor the effectiveness of the means and methods of the training process.

In game sports, they are characterized by the differentiation of the values of muscle and fat mass in accordance with the playing role. Each sport has a specific morphological model, which is the basic advantage for successful training. At the same time, studies using bio impedance analysis of young men involved in football living in Central Asia have not been conducted.

There are a number of factors indicating certain features of ethnic differences in the population: the distribution of adipose tissue in the body, the rate of body weight gain as growth and maturation, the difference in the proportionality of the length of the body and limbs. According to literary sources, racial and ethnic characteristics also determine the composition of the body. Boys and girls of China (5-8 years old) they have a higher weight and fat mass compared to Japanese children of this age. African Americans in the prepubescent period have lower volumes of both the whole body and visceral and subcutaneous fat compared to their peers living in the republics of the Caucasus and Central Asia (4,5).

Methods

For high-quality training of young athletes in various sports and countries, the method of studying the compositional composition of the body is widely used, which allows to assess the functional state, determine the diet and monitor

the effectiveness of the means and methods of the training process.

Bio impedance analysis (BIA) is a proven method in sports practice for assessing the absolute and relative values of body composition components, based on measuring anthropometric parameters and components of the electrical impedance of an athlete's body area – active resistance (1, 2, 3).

To assess and control the functional state and training regime of young athletes, the method of body composition is widely used, which allows you to determine: body length and weight, body fat, lean body weight, total fluid, musculoskeletal mass. In game sports, they are characterized by the differentiation of the values of muscle and fat mass in accordance with the playing role. Each sport has a specific morphological model, which is the basic advantage for successful training. At the same time, studies using bio impedance analysis of young men involved in football living in Central Asia have not been conducted.

To ensure the high efficiency of the training of young football players, it is recommended to use the following methods: bio impedance analysis, pedagogical observations, instrumental methods. The listed groups of methods are related to each other. At the same time, in the training process of football players, where the foundation of intense training is being formed in order to maximize the realization of individual capabilities, it is necessary to use scientifically based methods in order to have extensive and objective information.

Results and discussion

According to the results of bioimpedance analysis, the component composition of the body of young football players was obtained. The use of the bio impedance method makes it possible to increase the informativeness of operational control and makes it possible to purposefully correct the physical condition of young football players in order to increase fundamental fitness, manage individual fitness (8, 9, 11).

The author states that when making a diagnosis of obesity and choosing methods for its correction, it is fundamentally important to use reliable methods for estimating the amount of adipose tissue.

Specialists in their work give indicators of the body composition of young athletes engaged in cyclic sports (14) (see table 1).

At the stage of advanced specialization (13-14 years old) in football. where the basis is the formation of a solid foundation. for which it is necessary to widely use elements of various sports (6). It is important to choose such a measure of training and competitive loads. to increase special physical fitness and create prerequisites for the stage of sports improvement. Hence, in order to manage and scientifically conduct the process at the stage of sports specialization. it is necessary to use bioimpendance analysis data. Indicators of the compositional composition of the body of boys aged 13-14 years are mostly very individual. Hence, the program of the educational and training process should be differentiated-personal in nature. In foreign countries, 12-year-old boys have training sessions compiled and conducted taking into account the game specialization (10).

Table 1. Data on the compositional composition of the body of young athletes engaged in cyclic sports .

Indicators	Swimmers	Rowers
Body length, cm	178	180
Body weight, kg	61	67
Body fat mass, kg	10.3	11.0
Skinny body weight, kg	53.9	54.4
Basic exchange, kcal	1605	1661

Systematic sports activities. they lead to adaptations in the leading functional systems of the student's body, in particular: reduction of body fat. increase in muscle mass of the body, acceleration of metabolic processes. education and improvement of physical qualities. what has a positive effect on the physical health of the athlete.

The coaching staff of boys aged 13-14 should continue diagnostics using Xiaomi Composition Scale 2 smart scales.

Table 2. Bio impedance analysis of the Children's and youth sports school team of the Tashkent district, born in 2007, from 7. 10. 2020.

№	Full Name	Body weight, (kg)	Body length, (cm)	Body fat mass %	Muscles (kg)	Water %	Protein %	Basic exchange (kcal)	Visceral fat	Bone mass (kg)	Ideal weight (kg)
1	Turgunbayev	45.95	157	5.2	41.4	65	25.2	1332	1	2	53.9
2	Badalbayev	36.15	150	5	32.6	65.1	25	1192	1	1.7	47.6
3	Mirsolihov	47	158	7.5	43.8	63.4	24.2	1390	1	2.3	56.7
4	Shukrullokhodjayev	42	158	5	37.7	65.1	25.2	1274	1	1.9	49.7
5	Omanov	73	179	19	55.6	55.5	21.2	1715	7	2.9	66.5
6	Mahmudov	44.7	158	6	40	64.4	25	1316	1	1.9	51.1
7	Tohirjonov	49.7	161	8.3	43.2	62.8	24	1376	1	2.3	56.7
8	Tulaganov	65	178	11.3	50.6	60.7	23.2	1532	2	2.7	66.5
9	Sobirjanov	45	167	5	39.9	65.1	24.5	1314	1	2.3	59.5
10	Ziyovuddinov	46.4	161	5	41.7	65.1	24.8	1337	1	2.3	56
11	Rahimov	39.1	157	5	35.1	65.1	24.7	1226	1	1.9	57.4
12	Yafarov	49	158		38.5	60.7	23.6	1374	1	2	48.5
13	Nabijonov	40	150	5	36.2	75	15.4	1251	1	1.8	
14	Normatov	44.5	155	8.9	38.6	62.4	24.3	1325	1	1.9	48.3
15	Turgunov	52.85	167	8.4	45.9	62.8	24	1429	1	2.5	59.5
16	Sobirjonov	38. 5	150	5	33.7	65.1	25	1210	1	1.7	48.3
17	Shukhratov	38	160	5	34	75	14.9	1209	1	1.9	56
	X Arithmetic mean	**47.4**	**160.2**	**7.2**	**40.5**	**64.6**	**23.2**	**1341.3**	**1.4**	**2.1**	**55.1**
	Root mean square	**9.6**	**8.5**	**3.7**	**6.1**	**4.6**	**3.2**	**130.7**	**1.5**	**0.3**	**6.1**
	V% Coefficient Of Variation	**20**	**5**	**51.72**	**15**	**7.2**	**13.7**	**9.74**	**103.4**	**16**	**11**
	Student's t-distribution	**0.7%**	**0.2%**	**4.4%**	**0.8%**	**0.5%**	**1.4%**	**0.0%**	**19.6%**	**14.0 %**	**0.6%**
	R Influence Grade	**6**	**7**	**7**	**8**	**10**	**15**	**7**	**3**	**8**	**10**

Table 2. Bio impedance analysis of the Children's and youth sports school team of the Tashkent district, born in 2007, from 4. 10. 2020

№	Full Name	Body weight, (kg)	Body length, (cm)	Body fat mass %	Muscles (kg)	Water %	Protein %	Basic exchange (kcal)	Visceral fat	Bone mass (kg)	Ideal weight (kg)
1	Turgunboyev	48.65	157	8.5	42.10	62.7	23.9	1372	1	2.30	53.9
2	Badalbayev	37.20	150	5	33.6	65.1	25.1	1208	1	1.7	47.6
3	Shukrullokhodjayev	37.80	158	5.0	37.80	65.1	25.0	1254	1	1.90	49.7
4	Omanov	78.95	179	22.9	57.70	56.8	20.2	1811	8	3.00	66.50
5	Makhmudov	46.40	158	8.5	40.40	62.7	24.4	1342	1	1.9	51.1
6	Tokhirjonov	52.45	161	13.0	43.2	59.6	22.7	1419	2	2.3	54.60
7	Tulaganov	60.80	178	6.8	53.6	63.9	22.4	1533	1	2.90	73.50
8	Sobirjanov	47.20	167	5.0	41.80	65.1	24.7	1335	1	2.30	59.50
9	Ziyovuddinov	47.6	161	5.9	41.7	64.5	24.6	1354	1	2.3	56
10	Rahimov	40.80	157	5	36.7	65.1	24.9	1252	1	1.9	57.4
11	Yafarov	54.50	158	17.1	42.80	56.8	21.7	1463	4	2.30	54.50
12	Nabijonov	40.20	150	5	36.3	75	15.4	1252	1	1.8	48.30
13	Normatov	49.5	155	14.9	40.10	58.3	22.7	1391	2	1.9	48.3
14	Turgunov	55.85	167	9.0	48.10	62.4	23.8	1470	1	2.6	63.00
15	Akhmadjanov	72.05	180	17.0	56.7	56.9	21.8	1705	6	3.0	70
	X Arithmetic mean	**51.3**	**162.4**	**9.9**	**43.5**	**62.667**	**22.9**	**1410.7**	**2.1**	**2.3**	**57.1**
	Root mean square	**11.9**	**9.8**	**5.7**	**7.4**	**4.72**	**2.5**	**169.0**	**2.2**	**0.4**	**8.4**
	V% Coefficient Of Variation	**23**	**6**	**57.6**	**17**	**7.5**	**11.08**	**12**	**101.57**	**19**	**15**
	Student's t-distribution	**0.6%**	**0.2%**	**3.2%**	**0.7%**	**0.5%**	**1.4%**	**0.0%**	**14.0%**	**13.2 %**	**0.6%**
	R Influence Grade	**7**	**6**	**6**	**5**	**10**	**9**	**7**	**4**	**10**	**7**

At the same time, temporarily reduce high-intensity loads based on individual characteristics, where a large amount of energy is consumed. In accordance with the data of bio impedance analysis, a training program for football players is being compiled, there is a certain drawback, in the metabolism, why it is necessary to improve nutrition.

Conclusion

Significant differences have been identified. Based on the survey indicators of 20 football players aged 13-14 years living in Tashkent (Central Asia). The data are shown in Tables 2, 3. Xiaomi Composition Scale 2 smart scales were used in the study. The first survey was conducted on October 7, 2020. The average body weight was x =47.4±9.6 kg. More than the average value was determined in 5 young men (2.9%), and 12 athletes had results below the average value. The body length was x=169±9.5 cm, only four athletes had more than the average value. The body fat mass was x=7.2±3.7%. Five young men have above-average results. The muscle mass of the body was x=40.5±6.1 kg The highest value was found in % of total water x =60.4±4.6. The main exchange was x =1341.3±130.7 kcal.

Comparing these data with the indicators of football players (see tables 2,3) follows, that practically young football players in all parameters have a significant lag in each indicator.

The percentage of protein was x =23.2±3.2% in 13 young men, it is in good condition. After two months of training sessions by remote method (in the conditions of the coronavirus pandemic), minor changes in body composition parameters such as body weight were determined and the data of the main exchange improved in the second measurement.

Interpreting the results of young football players measurements of visceral fat from 1 to 9 (the level is normal), from 10-14 - high content, from 15 to 30 is harmful to health (11). In the formula for calculating the basic metabolism of the authors(5), taking into account the age and body weight of 50 kg (16-29 years) - 1450 kcal. In boys aged 13-14, at the first measurement 07.10.2020 x = 1341 kcal and at the second 04.01.2021 x = 1410.7 kcal, the improvement was 69.7 kcal. The coaching staff needs to pay attention to the indicators of the basic exchange and take them into account when drawing up a plan for the preparation of football players. At the same time, it should be noted, that there are differences in each indicator of the body composition of young football players, which states the fact that it is necessary to draw up a training plan for each athlete (or combine them by subgroups of young men) (Tables 2,3).

In turn, when compared with the results of swimmers and rowers, football players are almost significantly weaker. It is clear that the competitive activity of swimmers and rowers differs significantly from the playing activity of football players, which means the training process, nevertheless, at the stage of in-depth training, to some extent, the indicators of the functional state of young athletes should be more equivalent.

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