

Morpho Functional Indicators Of Girls Involved In Athletics

Saidbaeva Lola Mukhammedovna¹, Alieva Rano Amanullaevna², Mirzabekova Feruza Nasretidinovna³,
Sirojiddinova Sohiba Mamasidikovna⁴, Mirzabekov Ismoiljon Adakhmzhonovich⁵, Abdullaev Azizbek
Akbarovich⁶

¹Doctor Of Biological Sciences, Professor

²Teacher Andijan State University

³Senior Teacher Andijan State University

⁴Teacher Andijan State University

⁵Master's Student Andijan State University

⁶Teacher Of Andijan State Medical Institute



Abstract – Exercise makes high demands on the body, especially the female, due to its physiological characteristics. The article contains a study of the impact of athletics on the female body. Athletes 16-19 years old were studied somatometric (height, body weight, chest circumference, dynamometry of the hands) and physiometric (vital lung capacity, heart rate, blood pressure) indicators.

Keywords – Athletics, Female Body, Somatometric And Physiometric Measurements.

I. INTRODUCTION

Athletics is a sport that includes several types of exercises: walking, running, jumping, throwing. Each of these species has a versatile effect on the human body. They develop qualities such as strength, speed, endurance. These exercises increase the functionality of the body and ensure high performance.

Systematic physical culture and sports activities significantly affect many morphological and functional characteristics of the body, depending on age and gender. [1,3]

In this regard, it is important to study the physical activity of the female body, taking into account the characteristics of development.

It is known that the female body is significantly different from the male in its morphological and functional indicators. First of all, these are differences in body size, height, functional indicators for physical activity. These rates are lower in women than in men, which is associated with lower performance and lower heart and blood volumes. [6.9]

Of particular interest is the study of physiological and anthropometric indicators and the adaptation of systems to the functional loads of the female body involved in various sports.

The aim of this study was to study the effect of physical activity on the physical development and functions of the cardiorespiratory systems of the body of girls aged 16-19, who go in for athletics.

II. METHODOLOGY

The study involved girls attending the Olympic Reserve Sports College in Andijan. The functional state of the organism of girls aged 16-19 years was studied, in each group there were 25 people. Anthropometric measurements were carried out in all subjects: height, body weight, chest circumference at rest, during inhalation and exhalation. Measurement of the chest circumference in all these conditions was carried out at the level of the armpit, the level of the nipples of the mammary glands and the level of the xiphoid process of the sternum. In addition, the strength of the muscles of the hand was determined by the dynamometry method. [2]

To study the functional parameters of the girls' bodies, the heart rate (HR) was measured, blood pressure (BP) was measured by the Korotkov method and the vital capacity of the lungs (VC) by the spirometric method. [2]

As a control group, we studied similar indicators of students of secondary schools of the same age in Andijan.

The data obtained were statistically processed by the Student-Fisher method.

III. RESEARCH RESULTS AND DISCUSSION

Exercise is an important part of a healthy lifestyle. One of the indicators of health and physical development is body weight and length. The study of body growth is necessary to assess other signs of physical development, and body weight is the most sensitive parameter with the fastest dynamics of change.

Exercise leads to an increase in muscle mass and therefore an increase in maximum muscle contraction force. [7.8]

According to our data, the body weight indicators of female athletes of 16 years old averaged 53.2 ± 1.8 kg, 17 years old - 60.6 ± 2.3 kg, 18 years old - 59.8 ± 2.1 kg, 19 years old - 61.1 ± 1.9 kg. The data obtained showed that the greatest increase in body weight was observed in girls 17-19 years old compared to 16 years old, which can be explained with certain hormonal shifts in the girls' bodies. Similar results were revealed in terms of height: 159.7 ± 1.6 cm, 164.0 ± 1.9 cm, 160.7 ± 1.6 cm, 164.9 ± 2.3 cm, respectively, a comparison of the average growth rates of female athletes and girls who do not go in for sports did not reveal significant differences ($p > 0.5$).

Due to the fact that an increase in muscle strength leads to an increase in the strength of muscle contractions, the contraction of the flexor muscles of the fingers of the hands was studied. The maximum force of contraction of the fingers of the right hand in girls 16 years old averaged 26.3 ± 1.3 kGm, 17 years old - 31.9 ± 1.2 kGm, 18 years old - 32.0 ± 1.8 kGm, 19 years old - 34.0 ± 1.3 kGm. The same indicators of the left hand were 25.7 ± 1.5 kGm, 29.6 ± 0.3 kGm, 31.0 ± 1.4 kGm, 33.5 ± 1.2 kGm, respectively. These data showed a significant increase in the maximum force of muscle contraction depending on the age of the athletes ($p < 0.001$).

It is known that the respiration of women is characterized by lower volumes and capacities of the lungs, higher frequency indices. In this regard, it was of interest to study the shape of the chest, topography and morpho-functional properties of the organs of the chest cavity. Therefore, measurements of the chest at the level of the armpit, nipples of the mammary glands and the xiphoid process of the sternum were taken at rest, deep inhalation and exhalation. Resting chest circumference at the level of the armpit in female athletes increased with age. A significant increase was found in girls 19 years old ($p < 0.01$). Similar data were obtained when measuring at the level of the nipples of the mammary glands. An increase in these indicators was observed in girls of age groups. However, this increase was not significant. Measurements at the level of the xiphoid process of the sternum also showed an increase. With a deep breath, all groups of subjects showed an increase in indicators in all types of measurements. The greatest significant increase in the chest circumference with a deep breath was found in girls 17 and 19 years old. This was especially true for measurements at the level of the nipples of the mammary glands and the xiphoid process of the sternum, which indicates an increase in the volume of the chest.

The indices of the chest circumference during deep exhalation practically did not differ from those at rest.

As can be seen from the data obtained, physical exercises have a significant effect on the physical development of the body, which indicates the development of complex compensatory-adaptive reactions that arise as a result of physical exertion. In this regard, it is of great interest to study the state of the cardio-respiratory system of the body of girls involved in athletics. The heart rate in girls 16-17 years old was 88.0 ± 1.3 beats / min and 82.8 ± 0.7 beats / min, respectively, which is associated with the physiological state of the body. Since the formation of the cardiovascular system continues in this period, which affects the state of this indicator, the heart rate level in girls 18-19 years old was lower: 74.0 ± 1.5 beats / min and 73.8 ± 1.8 beats / min, respectively. This is an indicator that the activity of the cardiovascular system is approaching that of an adult body. Comparison of these indicators for girls 16 and 19 years old revealed a decrease in heart rate in girls 19 years old by 14.2 beats / min. This difference is statistically significant ($p < 0.001$). A decrease in heart rate at rest to a certain extent reflects the productivity and efficiency of the functioning of the cardiovascular system.

The data obtained show that a decrease in heart rate occurs due to an increase in the systolic volume of the heart. This increase indicates that an increase in the physical performance and qualifications of athletes leads to corresponding changes in the functional state of the heart.

Therefore, changes in heart rate as a result of exercise depend on the age and duration of the exercise. The dynamics of this state reflects the level of metabolism in the body and its efficiency.

Blood pressure indicators were studied along with the heart rate. The blood pressure level depends on the following factors: the amount and viscosity of blood entering the vascular system per unit of time, the capacity of the vascular system, physical activity, the external environment, etc.

It is known that systolic and diastolic pressure in healthy men grows evenly with age, while in women the dependence of pressure on age is more complicated: from 20 to 40 years, their pressure increases slightly, and its value is less than that of men; after 40 years, with the onset of menopause, blood pressure indicators rapidly increase and become higher than in men [2,7]. During exercise, systolic and diastolic blood pressure, cardiac output and heart rate increase.

BP indicators in athletes are within age groups. With the development of fitness, there is a tendency to an increase in blood pressure. [5,10]

According to our data, systolic blood pressure in 16-year-old girls was 96.6 ± 1.0 mm Hg. Art. , 102.0 ± 2.2 mm Hg, and 107.2 ± 1.6 mm Hg ($p < 0.001$), respectively. Diastolic pressure also tended to increase (Fig.). This is due to a decrease in tissue demand for blood supply. In this regard, small arteries narrow, their lumen decreases. The resistance to the outflow of blood to the periphery during diastole increases, which leads to an increase in diastolic pressure [10].

Systematic exercise also affects the morphological and functional capabilities of the respiratory system. This is one of the most important conditions that ensure increased oxygen consumption during work. These changes are expressed in the development of the respiratory muscles, which can be judged by the measurements of the chest circumference in various states (Fig. 1).

An important indicator of an athlete's physical performance is the vital capacity of the lungs (VC). VC depends on gender, age, body size, physical development. This indicator for girls 16 years old was $2942, 0 \pm 131.1$ ml. With age, a significant increase in VC was observed ($p < 0.001$). To assess the respiratory function of the lungs, a vital indicator was calculated, i.e. the ratio of VC (in ml) to body weight (in kg). The vital index was within the normal range (tab. 1). An increase in this indicator depending on age indicates the development of the respiratory function of the chest of athletes.

Table 1. Respiratory system indicators in female athletes depending on age

Age, year	LVC, ml	Life index ml / kg
16	$2942,0 \pm 131,1$	55,3
17	$3264,0 \pm 69,3$	53,8
18	$3468,0 \pm 90,8$	57,9
19	$3532,0 \pm 71,16$	57,8

Along with this, calculations of the Quetelet index were made, which was calculated as the ratio of weight in g to height in cm. According to our data, the average indicator of this index for girls aged 16-19 was 354.6 g / cm; 369.5g / cm; 372.1 g / cm; 370.5g / cm respectively.

Thus, regular exercise causes certain changes in all body functions. For the harmonious development of physical, moral, moral-volitional qualities, the correct construction of the training process is important. [4] When organizing and conducting athletics classes with women, it is necessary to take into account their anatomical and physiological characteristics at different age periods.

It is known that the development of a woman's body in these age periods is uneven. For example, the growth of the body in length in girls under 11 years of age is more intense than weight gain. The proportions of the body change: the legs lengthen, the chest rate decreases.

In adolescence, the physical development of girls differs significantly from the development in the previous period, since the active period of puberty begins. At this age, signs of uneven growth of parts of the body are clearly manifested.

During puberty, the rate of growth and development of the respiratory system is the highest, the aerobic capacity of the body increases. The mechanisms of adaptation of the cardiovascular system as a whole to physical activity during this period are not yet perfect [1]. At the age of 16-18, gender differences in body size and proportions, functional capabilities and general working capacity of boys and girls become clearer. loads leads to an increase in the functional capabilities of the body of girls and girls, who, in many important indicators of the functional state, differ significantly from girls who do not go in for sports.

Each type of athletics has a different effect on the body of women and contributes to the development of the necessary qualities. When carrying out training sessions in all types of athletics, it is necessary to take into account the peculiarities of the specific biological cycle of the female body - the ovarian-menstrual cycle (OMC) and the physical capabilities of women, depending on their specialization.

Menstrual irregularities occur with excessive physical exertion or overtraining and cause an increase in the release of adrenocorticotrophic hormone by the pituitary gland, which increases the release of androgens by the adrenal glands, this inhibits the function of the pituitary gland, as a result of which the function of the ovaries is disrupted.

When developing and improving physical qualities and motor skills in training athletes, it is necessary to be guided by the general principles adopted in training. At the same time, it is necessary to take into account the specifics of the female body. Knowledge of the basics of physical training, ways of developing and improving physical potential, medico-biological foundations of training and hardening contributes to the achievement of a high level of health and harmonious perfection of a person.

REFERENCES

- [1] Abramova G.A Funktsionalnoye sostoyaniye serdechno-sosudistoy sistemy u devochek, zanimayushixsya sportom /G.A.Abramova, Yu.M.Vatchin // serdechno-sosudistaya sistema u detey v norme i patologii: sb.nauch.tr.Gorkiy, 1985.-s.87-91.
- [2] Dubrovskiy V.I Sportivnaya meditsina.// M.Gumanit.izd.sentr VLADOS, 1998-480s.
- [3] YEvsyeyev A.V. Aktualnyye problemy fizicheskogo vospitaniya, sportivnoy trenirovki i formirovaniya zdorovogo obraza jizni /A.V YEvsyeyev // Tez.mejregion.nauch.konf.YEkaterinburg, 2000.-ch.2. s.83.
- [4] F.Kerimov, M.Umarov. Prognozirovaniye i modelirovaniye v sporte Tashkent-2018-355s.
- [5] Kovalyov V.D.(red).Sportivnyye igrы // M.:”Prosvetyeniye”.1988,s.303, Legkaya atletika pod red. N.G.Ozolina, V.I.Voronkina, Yu.N.Primakova //M.: FiS, 1989-670s.
- [6] Kreff A.F., Kanyu M.F. Jenщina i sport:// Per.s frans. M.: FiS, 1986-143s.
- [7] Pshennikova M.G. Adaptatsiya k fizicheskim nagruzka /M.G. Pshennikova // Fiziologiya adaptatsionnykh protsessov: ruk-vo po fiziologii. –M., 1986.-s.124-221.
- [8] Semkin A.A. Fiziologo-bioximicheskoye obosnovaniye podgotovki sportsmenov /A.A.Semkin, K.A. Baturin //Teoriya i praktika fizicheskoy kultury. 1987.-№12.,s.44-47.

[9] Fyodorov L.P. Teoretiko-metodicheskiye osnovy jenskogo sporta: Uchebnoye posobiye, // SPb.: SPb Gosudarstvennyy tekhnicheskiy universitet, 1995.-20s.

[10] Fiziologiya cheloveka pod red. N.V. Zimkina // M.: FiS. 1975, 496s.