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Determination of the functional status of middle-distance runners in the research-training group

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Abstract

Purpose: Improving the effectiveness of improving the physical fitness of a middle-distance runner during training.

Methods: The following methods were used during the study: 1) Analysis of literary sources, research papers and scientific articles in which scientific research, scientific and practical experience of foreign and domestic scientists in the field of sports were studied and analyzed 2) A pedagogical test during which the technical actions of young gymnasts players during competitive activities were monitored 3) Mathematical and statistical calculation, in which the coefficient of useful movement of technical movements of young gymnasts in attack was calculated using a mathematical formula 4) Methods of pedagogical control were used.

Results: With this submaximal load, blood pressure indicators also increased and amounted to 140/90 mm. rt. st. With the help of these tests, the functional level of athletes was determined and the following conclusions were made. At the last stage of the functional test, the intensity of the load increased to 20 km per hour, and after 342 ± 28 seconds, the number of heartbeats reached a maximum level of 195 ± 11 beats per minute. With this submaximal load, blood pressure indicators also increased and amounted to 160/90 mm. rt. st. With the help of these tests, the functional level of athletes was determined and the following conclusions were made.

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Keywords: training group, runners, physical fitness, functional index, fast movement, explosive power, special endurance, comparative analysis, dynamics of physical fitness, annual training.

Introduction

In our country, it is necessary to solve the priority tasks of developing athletics, increasing its popularity, selecting talented young middle-distance runners, sending them to the stages of long-term training, and achieving high athletic results (1,2).

Today, many scientists are conducting and have conducted research on the preparation of middle-distance runners for competitions (3, 4,5). Although F.P.Suslov, A.I.Polunin, O.Pavlova, V.Nikitushkin, Yu.G.Travin, V.N. Verkhoshanskiy, M.S.Olimov, H.T.Tukhtaboyeb, B.T.Khaydarov, I.R.Soliyev, R.A.Burnashev and others paid attention to the issues of planning annual preparatory training, pre-competitive training, selection and orientation, preparation of athletes for long-term stages of preparation and management of the training process, it was found that in our country there is not enough research on the issue of training middle-distance runners (6, 7).

We know that sports schools today are leaders in preparing reserve athletes for the national team (8).

The analysis of the sports results of middle-distance runners in the conducted study shows that the absence of Uzbek athletes at the World Championships, Asian and Olympic Games, as well as the low level of sports results indicate the presence of a sufficient number of problems in the training system of middle-distance runners (9, 10).

In addition, the development and implementation of improved optimal options for multi-year training programs is today one of the urgent and immediate tasks in this area.

Methods

The following methods were used during the study:

Analysis of literary sources, research papers and scientific articles in which scientific research, scientific and practical experience of foreign and domestic scientists in the field of sports were studied and analyzed;

A pedagogical test during which the technical actions of young gymnasts players during competitive activities were monitored;

Mathematical and statistical calculation, in which the coefficient of useful movement of technical movements of young gymnasts in at-

tack was calculated using a mathematical formula.

Results and discussion

By constantly checking the functional condition of middle-distance runners during training and competitions, we have obtained certain results. During the examination, the examination of various organs and body systems based on comprehensive tests made it possible to obtain the necessary information. It analyzed the number of heartbeats, the body's response to a certain load, the adaptive capabilities of the athletes' body and the level of recovery after exertion.

Table 1. Dynamics of formation in the study of body composition indicators of middle-distance runners of the experimental group (n=20)

Age (years)	Height (cm)	Weight (kg)	Muscle mass (kg)	Muscle mass (%)	Fat mass (kg)	Fat mass (%)	Fluid (%)
19,2±1,8	179,2±3,2	66,6±3,7	54,2±1,4	64,2±1,5	8,4±1,1	12,1±1,2	59,7

When analyzing body composition using bioimpedance technology, we identified changes and intermediate differences in the body composition of athletes at the beginning of the study and after it. The assessment of aerobic performance and functional tests, i.e. special performance, the reaction of the athletes' body to the load, their condition during running, were analyzed.

At the end of the study, body composition parameters were analyzed using bioimpedance technology. The purpose of this test is to determine the anthropometric characteristics of athletes, that is, the following various mass indicators: body weight in kg, muscle mass in kg and %, fat mass in kg and %, total fluid volume in % and the physical composition of this body composition very fast information was obtained when determining the effects and reactions to loads. We had the opportunity to get the necessary information for coaches and specialists. The results of our body composition test are presented in the following tables.

As can be seen from the table, the height of the 800-meter runners at the age of 19.2± 1.8 years was 179.2± 3.2 cm, and the weight was 66.6± 3.7 kg. Based on bioimpedance analysis, it can be said that the muscle mass was 54.2±1.4 kg, and the percentage of muscle mass relative to the body was 64.2±1.5%. It was noted that the fat mass was 8.4±1.1 kg, and the percentage ratio was 12.1±1.2%. According to the research results, 59.7% of the amount of fluid in the runners of the experimental group was at the level necessary for qualified athletes. In these cases, athletes should increase their fluid levels by at least 6-7% in order to show good results in a hot climate typical of the territory of Uzbekistan, that is, according to various leading scientists, the total fluid level should be equal to 58-60%. The method shown and developed by us is designed to increase the fluid level, adjust muscle mass taking into account individual parameters, show high results of fat mass in percentages and kilograms and gives a positive effect. These figures are considered very good indicators for 800-meter runners in athletics.

Determination of aerobic activity and special performance by means of special tests in stadium conditions.

Before conducting special tests, all 800 m runners were tested in the preparatory, pre-competition, competitive and post-competition periods, taking into account their sports specialization when performing special work in a zone of submaximal intensity. All 800-meter runners were in a state of recovery on the eve of the test in order to achieve reliable results during the test conducted in this zone of submaximal intensity. Before the tests, each 800-meter runner was continuously recorded the test and during the test, they were introduced to all indicators and safety rules. During the testing of 800-meter runners and obtaining functional indicators, the testers were monitored. Runners tend to perform submaximal loads and achieve high-quality results that require significant energy expenditure. Therefore, all athletes were examined after having a meal 2-4 hours before the test. Adequate fluid intake (drinking water) was provided to all athletes after the tests. A special 800-meter running test was developed to determine performance in the aerobic intensity zone and special performance. Using this method, at the beginning of the study, during it and at the end of the study, step-by-

Table 2. Establishment of a special level of performance testing for middle-distance athletes by means of a special step-by-step test n=20

Duration of the test (in seconds)	Load intensity (km/h)	Number of heartbeats under the load (beat/ min)	blood pressure under the load (mm. rt. st.)
51±9	10	90±8	120/80
102±12	12	119±11	126/84
162±14	14	142±13	130/83
222±11	16	168±9	135/85
282±17	18	174±10	140/90
342±28	20	195±11	160/90

step physical exercises adapted to the height and weight of athletes were given. The average load duration is 6 minutes, starting at a speed of 10 km per hour, the maximum performance of the athlete's body was determined in a load intensity test up to 20 km per hour. At the same time, the maximum number of heartbeats and the blood pressure level of athletes were determined depending on the effect of training. The number of heartbeats was measured with a modern gadget — the Polar h10 heart rate monitor, and the test showed that the intensity of step-by-step loads increased by the minute. The 800-meter runners monitored their body's reaction every minute while running and tried to maintain the rhythm of running, determined special performance and fatigue indicators.

As can be seen from Table 2, when athletes performed intense exercise at a speed of 10 km/h for 102 ± 12 seconds, the number of heartbeats increased by 90 ± 8 beats per minute, while blood pressure was 120/80 mm. rt. st. These indicators are equal to the lower indicator of aerobic metabolism, and their functional state indicates that they can freely perform the next step-by-step physical activity. At a speed of 12 km per hour, the number of heartbeats was 119 ± 11 beats per minute, the duration of the test was 102 ± 12 seconds, blood pressure was determined - 126/84 mm. rt. st. In the following 162 ± 14 seconds of intense exercise, 14 km per hour, the indicators were the same: the number of heartbeats in 800-meter runners was 142 ± 13 beats per minute, blood pressure was determined as 135/85 mm. rt. st. At the fourth stage of this test, i.e., it was found that the intensity of the load increased for 222 ± 11 seconds, and the running speed was 16 km/h. At this stage, the number of heartbeats in athletes is 168 ± 9 beats per minute, and blood pressure readings are 135/85 mm. rt. st., which indicates that the body of runners is 800 meters closer to the upper threshold. aerobic-anaerobic metabolism. These indicators reflect the transition to the maximum limits of functional preparation of athletes for the next step-by-step load and the level of special resistance to load. At the next stage of the functional test, the intensity of the load increased to 18 km per hour, and the number of heartbeats reached its maximum level after 282 ± 17 seconds, that is, it became equal to 174 ± 10 beats per minute.

Conclusion

Using bioimpedance measurement technology, the amount of fluid, fat and muscle mass in the body of middle-distance track and field runners was determined in kilograms and percentages. The obtained indicators served as the basis for individualizing the training of 800 m runners, the rational distribution of physical activity, and also helped to track the dynamics of their physical development.

The results of tests conducted to determine the level of development of the functional state showed that although middle-distance track and field runners are ready to show high results in their sports at the national level, it was found that there are tasks such as further expansion of aerobic and anaerobic capabilities, further improvement of special endurance using

various training methods, and also, an increase in the level of general physical fitness in order to show competitive results at prestigious international competitions.

Today, it has been established that bioimpedance technology has its relevance in the phased preparation of athletes for competitions, which makes it very convenient for quick control of the training process during the preparatory periods of 800-meter runners and makes it possible to obtain accurate digital information about the state of the body.

To check the functional state of the 800-meter runners, it was possible to observe the time of adaptation or non-adaptation of their body to submaximal power work through various loads. During the loading process, it was established which functions of the functional system are quickly exhausted, and which load resistance is not manifested, which allowed us to establish the reason for the special labor abilities of 800-meter runners.

The role of bioimpedance analysis in assessing the functional training of 800-meter runners has been determined. The components of such an assessment include an assessment of the current state and reserve capabilities of the cardiovascular system, fat mass, size and fitness of the muscular system, technical and tactical training, and the level of metabolic activity.

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