The use of the multicomplex sports nutrition "MDX" in martial arts athletes

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Abstract. The composition of the diet is very significant for the development of various physical qualities in humans. The use of balanced supplements has a positive effect on the body's condition and increases the success of trainees in many sports. One of the options for optimizing nutrition for athletes can be the use of the sports nutrition multicomplex MDX. This product is obtained by microbiological processing of whey followed by low-temperature thickening. It contains oligopeptides and free amino acids, glucose, galactose, nucleic acids, a number of vitamins and microelements, betacarotene, ergosterol, folic acid, endosomal enzymes of lactic acid bacteria. In addition, the product contains a live culture of lactic acid bacteria: L. Lactis, L. Thermophyilus, L. Bulgaricus. Hand-to-hand fighters, judokas and Greco-Roman wrestlers took part in the work. Athletes (70 males: adolescents and young men) regularly took this product according to the following scheme: five days 1g/kg body weight and two days off. The daily dose was divided into two parts. Combat athletes took one part 30 minutes before the start of training, the second they took 30 minutes after the end of training. It was found that among the sports specializations taken into account, judoists who received the multicomplex MDX sports nutrition had the highest speed. They were faster than hand-to-hand fighters and fighters.

1 Introduction

The gradual development of all aspects of sport and aspects of personal development in it make it necessary to maximize the mobilization of all the capabilities of the athlete, the efforts of his preparation for worthy participation in competitions [1,2]. Previous work based on university physical culture and sports practice proves that there are several factors that can inhibit the involvement of young people in regular sports activities [3,4]. This is largely due to the insufficient implementation of many possible activities that contribute to the development of different sports and the significant implementation of the physical abilities of athletes [5,6]. The leading ones among them can be considered the development of the material and technical base for each sport and the existing requirements for it (frequency of sports training during the week, formation of an effective scheme); planning

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the training load for those involved; training tools used in work; schedule of competitions, qualifications of involved coaches, current organizational structure of a sports organization [7,8,9].

The initial level of abilities, their dynamics and the degree of achieved development of basic physical abilities in trainees of different ages and especially young people studying at the university are very important for science and practice [10]. A serious contribution to this is made by the work of trainers and physical education teachers who educate athletes and athletes. Currently, various sports are developing very actively, especially among young people. Unfortunately, despite the importance of the issue, there is no complete comprehensive system for the physical development of student youth in many sports at the university [11]. At the same time, it is recognized that physical activity is an effective option for the physical development of the body, including: strength, agility, speed, coordination, speed in a changing environment while maintaining self-confidence [12]. For this reason, they recognize the need to wisely combine traditional means of physical education and sports for future specialists, which will improve their professional development in all respects [13].

In the course of physical education of young people, there is a wide range of means and approaches for training for targeted improvement of physical properties, movement skills and provision of applied physical training in accordance with the specialty profile [14]. An important role in the physical education of young people is to ensure a high motor effect in different types of sports specialization, participation in training and obtaining significant sports achievements [15].

An important feature of youth sports is its dependence on its leading educational activities [16]. In this regard, it is clear that playing sports among all categories of youth leads to a clear merging of the phenomena of basic physical training and applied sports with access in some cases to elite sports [17]. Regular exercise of sufficient intensity is very effective in terms of consolidating sports skills [18].

Sport has firmly taken its place in the development of youth, strengthening their physical fitness, increasing efficiency and increasing intelligence [19].

Sports activities must be feasible, sufficient in time and regular, as a result of which the effectiveness of training can be ensured. The used set of exercises that promote physical development can quickly and effectively ensure an increase in the physical capabilities of trainees [20]. Due to the feasibility of effective exercises, taking into account and applying many aspects of an athlete's activity [21]. Implementation of educational and training sessions should be carried out taking into account the existing specifics of the chosen sport, using available means for sports training, if possible, individualize the course of training and influence the level of motivation and the desire for sports development.

Improving physical capabilities during sports activities is recognized as a leading problem. The study of its aspects remains extremely important in theoretical and practical terms for sports science [22]. The development of physical qualities occurs largely individually and is possible throughout a person's life. This process can be corrected during feasible and regular physical activity within any sport [23].

Observations by various authors have revealed that during life, the sensitivity of body systems to environmental factors and, of course, to muscle loads, which have a stimulating effect on the body, fluctuates [24]. In this regard, it is very important to clarify the dynamics of various physical parameters in beginning athletes as they grow older. This can help create the most suitable conditions for stimulating the physical capabilities of athletes and increasing their athletic performance. Clarification of these dynamics is possible in the course of further research on the natural change of periods of ontogenesis under conditions of physical activity [25].

It is known that in the process of physical exercise at an early age, a person's diversified development occurs with the acceleration of the development of his physical capabilities. It is clear that their dynamics are of great importance for achieving sports results and optimizing the overall development of the body [26].

Adolescence and adolescence are characterized by high physical performance, which is significantly activated under the condition of physical training with rapid adaptation to loads. This is due to the fact that in a young body the resistance to muscle activity is very high. In this regard, the assessment of age-related development of the quality of speed in adolescents and young men during sports is of serious interest. This is significant for building a process of training activities that allows you to achieve a significant result without the risk of dysfunction and the initial manifestations of any diseases in trainees.

Purpose: to trace the development of speed in athletes using the example of martial artists who received the multicomplex MDX sports nutrition.

2 Materials and methods

70 male athletes were examined, including teenagers with sports experience of at least 1 year and boys with sports experience of at least 2 years. Several groups were formed from them: teenage judokas (14-15 years old) - 12 people, male judokas (18-19 years old) - 10 people; hand-to-hand combatants-teenagers (14-15 years old) – 14 persons, hand-to-hand combatants-youths (18-19 years old) – 13 persons; Greco-Roman style teenage wrestlers (14-15 years old) – 11 persons, Greco-Roman style youth wrestlers (18-19 years old) – 10 persons. In addition, two groups of physically untrained individuals (control) were collected: adolescents (14-15 years old) 14 individuals and boys (18-19 years old) 15 individuals. All athletes received the multicomplex MDX sports nutrition. The proposed product, obtained by microbiological processing of whey (cheese, curd, casein) using industrial cultures of lactic acid microorganisms and subsequent low-temperature condensation, contains hydrolyzed whey protein, oligopeptides and free amino acids, glucose, galactose, nucleic acids, vitamins: C, E , B1, B2, B6, PP, betacarotene, ergosterol, folic acid, endosomal enzymes of lactic acid bacteria, microelements: Cu, Zn, Mn, Fe and macroelements: K, Na, Ca, Mg and P. The product contains a live culture of lactic acid bacteria: L. Lactis, L. Thermophyilus, L. Bulgaricus ($1.2x10^8$).

Athletes regularly took this product according to the scheme: five days 1 g/kg body weight and two days off. The daily dose was divided into two parts. One part was taken 30 minutes before the start of training, and the second part was taken 30 minutes after the end of training.

The level of development of speed was determined during the 30 m running test.

The test results in this study were processed by Student's t-test.

3 Research results

The degree of development of the quality of speed largely determines the effectiveness of sports activities in martial arts. The speed parameters of an athlete are largely related to the functional features of his nervous system and musculoskeletal system [2].

The data found during the work are available in Table 1 below.

The greatest expressed speed was demonstrated by judokas. Their capabilities were higher than that of hand-to-hand fighters and wrestlers in adolescence by 15.5% and 31.1%, respectively. In groups of youthful age, the differences were higher, while maintaining the advantage of judokas. Differences at this age were 17.5% among judokas with hand-to-hand fighters and 32.5% with young wrestlers. In both age categories of athletes, wrestlers

had the lowest speed characteristics (5.9±0.42 s in the group of teenagers and 5.3±0.46 s in the group of boys). At the same time, judokas had pronounced differences in speed from the level of untrained people in the control groups. They reached 51.1% in adolescents and 50.0% in the youth group.

Table 1. The level of speed in the observed

Counted groups	Observed adolescence, M±m	Observed youthful age, M±m
Duration of 30m run in judo groups, s	4.5±0.68	4.0±0.53 $p<0.05$
Duration of 30m run in hand-to-hand groups, s	5.2±0.59	4.7±0.42 $p<0.05$ $p_1<0.05$
Duration of 30m run in groups of wrestlers, s	5.9±0.42 $p_1<0.01$	5.3±0.46 $p<0.05$ $p_1<0.01$
Duration of 30m run in control groups, s	6.8±0.38 $p_1<0.01$	6.0±0.44 $p<0.05$ $p_1<0.01$

Note: p - the significance of changes with age, p1 - the significance of differences from the level of judoists.

When tracking age-related changes in the level of speed, an increase in this parameter in young men compared to adolescents was revealed. In all the collected groups, there were differences in the development of the quality of speed between groups of adolescents and groups of boys. In a sample of judokas, a decrease in the 30m run index by 12.5% with age was noted, in wrestlers by 11.3%, in hand-to-hand fighters - by 10.6%, in controls - by 13.3%.

High speed capabilities in trained people compared to their level in physically inactive subjects of both ages may be due to the fact that with regular physical exertion, the quality of speed develops due to the activation of many physiological mechanisms [8]. This is due to the intensification of biochemical processes in nerves and muscles and between individual neurons, an increase in the overall activity of the nervous tissue, a more active transition of excitation from the nerve to the muscle, an intensification of information processing in the cortex [9], an increase in the number of active motor units in the trained muscles [10] .Obviously, in different categories of athletes, as a result of regular training, their physical reserves grow somewhat differently [11]. The increase in physical reserves is ensured by strengthening the musculoskeletal system of the body in response to regular physical activity in the course of performing physical exercises specific to the chosen sports specialization [12].

4 Discussion

Frequent optimally constructed physical activity is an effective stimulator of the whole organism [5]. Strengthening the function of the striated muscles of the limbs and the body during martial arts activates all manifestations of metabolism and hemocirculation in the internal organs and intensifies the repair of their tissues [7]. In active muscles, the number of wide-open capillaries increases, which ensures their intensive blood supply. In this

regard, under conditions of high activity of skeletal muscles, they get to receive a large amount of oxygen and more nutrients [4]. In this situation, the synthesis of proteins for various purposes increases in the musculoskeletal system and the formation of macroergs increases [8]. This situation contributes to the growth of muscle tissue mass and to the increase in its power characteristics by increasing the number of its fibers [6].

Previously, it was established that systematic muscle activity, implemented within the limits of one's ability, causes powerful stimulation of all parts of the body [12]. This effect was previously recorded in healthy individuals of different ages [8]. Sex differences in the effect of physical activity on the body could not be established [3]. A positive effect of regular physical training on the dynamics of the human body, which has the risk of pathology and some diseases, has also been noted [19]. In this regard, it is customary to consider regular rational muscle activity as an option for strengthening the whole body, which can be used as a component of a comprehensive health improvement [2].

Physical activity is considered to be a productive effect on the body that restores its normal functioning at any age. It is clear that different types of sports activities involve different muscle groups in the body. At the same time, regular martial arts in terms of general toning and strengthening of the body of young men have been poorly studied. The influence of different variants of regular martial arts in adolescence remains unclear. Previously, the general strengthening possibilities of this variant of physical activity were noted without significant specification regarding the dynamics of various parameters of the body at different ages.

At present, at a young age, there is often an interest in sports in order to improve various physical qualities [5]. It is very important for science and especially for the practice of sports to find out the influence of different types of martial arts on the quality of human speed. In this regard, a comparison was made of the features of the physical qualities of judoists, wrestlers and hand-to-hand fighters of adolescence and youth. The work clarified the possibilities of representatives of these species in terms of the development of the quality of speed.

In earlier works, it was found that in the body under conditions of physical exertion within the framework of martial arts, changes occur associated with strengthening and healing. It became clear that they provide some health effects [15]. However, it was not clear how the quality of speed is formed, which is extremely important in martial arts among representatives of different specializations of this direction in sports.

A high level of development against the background of regular sports training of the muscular system, the cardiovascular system and the respiratory system provided, as they grew older, an increase in the level of speed in trainees. This was most pronounced among judokas. Apparently, this physical activity increased the intensity of the work of all internal organs in a person to the greatest extent.

A very significant mechanism for increasing speed in a young body during training in martial arts may be the strengthening of their parameters of the cardiovascular system [13]. The highest level of speed among judoists should be associated with the best conditions for intensifying the supply of oxygen to body cells [20]. Apparently, regular judo exercises increase the blood flow through the capillaries to the greatest extent, normalize vascular tone and optimize the rheological properties of blood in comparison with hand-to-hand fighters and wrestlers. It is also clear that in the case of increased muscle activity due to judo, young men, compared with adolescents, strengthened the heart muscle to the greatest extent with a very favorable weakening of hemostasis parameters, which stimulated the course of hemocirculation in all tissues [7].

The acceleration of running among martial arts representatives is largely associated with the activation of the nervous system and the main part of the striated muscles during systematic physical exertion [3]. The acceleration of running in judoists is also associated

with an increase in the stability of their body during the run, providing a significant strengthening of the vestibular apparatus [4]. The functionally very beneficial changes found in the course of the study in adolescence compared to adolescence are caused by pronounced stimulation in the course of martial arts and especially judo of the muscles of the trunk and limbs. It is clear that these regular exercises are an effective option for stimulating whole body vascular tone and myocardial development [22].

The information established in the course of the work carried out gives grounds to believe that regular physical activity within the framework of martial arts can stimulate the physical capabilities of a person, normalize vascular tone and increase metabolism. The work performed ensured the elimination of previously existing gaps in the system of scientific knowledge, fully confirming the known knowledge. The conducted observation spoke about the important health-improving potential of regular martial arts, which increases with age in young men compared to adolescents. Considering the information received, we can assume that regular martial arts, and especially judo, can enhance the work of the heart and lead to an increase in the physical capabilities of adolescents and young men.

Taking into account the data recognized by science and the facts clarified in the conducted observation, it became clear that in judokas, in comparison with hand-to-hand fighters and wrestlers, the elasticity and strength of the muscles, especially of the lower extremities, increase as much as possible and the degree of joint mobility increases [5]. At the same time, systematic judo exercises can lead to the greatest stimulation of the synthesis of biologically active molecules in the vessels and cells of peripheral tissues, thereby enhancing the vital activity of all parts of the body [25]. It is clear that physical activity during judo exercises creates a stable balance of excitation and inhibition phenomena in the brain of trainees, thereby contributing to the normalization of sympathetic and parasympathetic activity, activating trophic phenomena in all tissues. Apparently, the severity of these processes exceeds similar processes in the body of hand-to-hand fighters and wrestlers [8].

5 Conclusion

The development of physical parameters during physical exercise in the context of the use of food products is now being considered particularly closely. Clarification of its aspects is very significant for the theory and practice of sports. The increase in physical capabilities is realized largely individually and occurs throughout the entire ontogenesis of a living organism. This process can be corrected through adequate regular physical activity when playing different sports. It has been noted that over the course of life, the level of sensitivity of different parts of the body to the action of external factors, including muscle loads, can change. Therefore, it is necessary to accurately determine changes in physical characteristics of trainees, especially young people. This can help create the most suitable conditions for athletes to develop their bodies, which will help them achieve high athletic results. Clarification of this dynamics may be possible in the case of tracking the age dynamics of a person's physical capabilities. At the same time, the quality of speed is important, which is considered as very significant for sports activity and can be developed during regular sports activities. In the work carried out, it was found that judoists have the most pronounced speed capabilities among the martial artists who received the MDH multicomplex sports nutrition. In this parameter they were superior to hand-to-hand fighters and fighters. During the implementation of maturation, all observed persons noted the development of speed, including all categories of martial artists and all physically untrained individuals.

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