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Stimulation of physical indices by biogenic water preparations

Abstract. Results of the research of activated water influence on physical qualities of sportsmen are to be presented. The water activated by helium-neon laser in accordance with the V.M. Iniyushin method of activation was applied for experiments. In each portion of the water 5-7 drops of the so called "AIKO" preparation had been added. As a result of permanent use of this method, work capacity during the training increases and tiredness appears more lately. This method has no doping effects and can be used for sport practice.
Keywords: activated water, laser, sport, tiredness, work capacity.

Introduction

Increase of sport results is noted in the various specializations lately. It depends on intensity and increase in the volume of physical loading, which can be observed in every kind of sports without exception. But this way has the limit, which will be reached very soon.

The physical possibilities of human body are not infinite; they are determined by the objective energetic characteristics of systems, organs and tissues. They are limited by the natural physiological protection systems what manifests as the appearance and development of muscle and nervous tiredness. By this reason the increase of the resistance to physical overloading, increase of endurance in the extremal sport activity conditions is one of the most important issues in the contemporary sport physiology and sport medicine.

Solving this problem can be achieved by stimulation of energetic processes, as well as by rising of the energetic reserves and possibilities. At our days pharmacological way (using of diverse drugs and stimulate preparations) is dominated for improving the energetic and trophic organism provision.

However, use of such products is restricted in sport activity by the hard reglamentory rules of the International Olympic Committee, as most of them are dangerous for sportsmen health and consequence of different endurableness of another ones [1, 2]. Currently, we have possibility to use the enormous value of experimental data and practical results of the works in various scientific fields to search the solution of the concrete problem. These conditions oblige trying to find new levels of current processes analysis and possible influence on them. Many reasons demand to find new ways of decision the problem of sportsmen organism need change which connected with the change of demands for element presentation in complicate coordinated kinds of sport, with increasing of training test intensity in cyclic kinds of sport, technical change in sportive games, wrestling, box etc. One of these ways is new methods and technology use.

It is known that light radiation of the red spectrum part has certain biological effect. In some papers was demonstrated that low energy radiation has normalizing effect and do not irritate tissue.

It had been reported that helium-neon laser radiation of low energy of the 633 nm wave-length has the same biological action. This biological effect is reveals so in direct irradiate as in irradiated preparation influence.

It was demonstrated that water treated by helium-neon laser irradiation increases the maintenance of haemoglobin and erythrocytes, promotes higher physical ability. Radiation of the helium-neon laser of the 633 nm wave-length stimulates haemopoetic process in marrow, activates brain cortex and provokes varios changes in cellular membrane and intracellular structure. It was the reason to study the possibility of vital process stimulation and improve

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sport results and work ability using the preparations treated by laser radiation of 633 nm wave-length [3, 4, 5, 6, 7, 8, 9, and 10].

Materials and methods

For experiments we used AIKO preparation. This substance represents the hydroplasma concentrate of biogenic water after the laser treatment. Studies were conducted at the National College of Sports on athletics department volunteers (18 people from 18 to 20 years, male), divided into 2 groups. Experimental group consisted of nine athletes, who took the "Aiko" biogenic water. Control group consisted of nine athletes, who did not take it. The procedure was conducted in accordance with the manufacturer's recommendation: 5-7 drops per a glass of water once a day for 30 days. In the experimental and control groups heart rate and blood pressure were evaluated.

Studies were conducted on the basis of the Republican Sport College on volunteer sportsmen, who study at department of fencing, weight-lifting and track and field athletics. Total 18 young males, aged 18-20, have participated in the experiment, forming two groups. 9 sportsmen of the first group took "Aiko" biogenic water; another 9 sportsmen did not take it. The procedure was conducted in accordance with the manufacturer's recommendation: 5-7 drops to a half of glass of water to be taken twice a day. Functional indexes of cardiovascular and respiratory systems (arterial pressure, pulse frequency and maximal oxygen consumption) were examined in volunteers.

Results and their discussion

The vegetative nervous system regulates the function of the circulatory, respiratory and other systems. Normal allocation of activities is very important in ensuring homeostasis. Through the autonomic nervous system adaptive - trophic influence of the central nervous system is carried out, which is heavily dependent on the functional state of the whole organism.

When sport exercises are conducted, in the period of rest, predominance of parasympathetic influence is noted, which provides saving of cardiovascular, respiratory and other systems (slowing heart rate, low blood pressure, decrease in respiratory rate, etc.). During the exercises and immediately after them the predominance of sympathetic influence is noted in athletes, contributing to a better adaptation to stress.

To study the dynamics of changes in the activity of the sympathetic division of the autonomic nervous system in control and experimental groups of athletes, we conducted an active orthostatic test before and after taking the drug "Aiko".

Orthostatic tolerance in well-trained athletes is considered good when the heart rate to 10-min orthostatic position does not increase by more than 11 beats/min (compared with the value of heart rate in the supine position), systolic and diastolic blood pressure rises, pulse pressure increases, and overall performance is good.

When satisfactory, orthostatic stability increase in heart rate to 10-min sample is up to 12 - 18 beats/min, systolic blood pressure does not change, diastolic blood pressure does not change or increases slightly, and the pulse pressure is not changed, sweating.

Low postural stability is characterized by a high quickening of the pulse to the 10-min orthostatic position (19 beats/min or more), systolic blood pressure decrease within 5 - 10 mm Hg, pulse pressure decrease by more than 50 %, the lack of steady state for heart rate, poor overall performance, paleness of skin, dizziness.

Analysis of the data obtained during the orthostatic showed that the experimental group athletes at the beginning of the experiment in the supine position level (M ± m) heart rate, systolic blood pressure, diastolic blood pressure was about to 57 ± 6.7 beats/min; 123 ± 7.9 mm Hg; 70 ± 8.1 mmHg, respectively, to the 10-min standing level of the average heart rate rose to 70 ± 6.5 beats/min, systolic blood pressure index increased to an average of 130 ± 3.6 mm Hg, diastolic blood pressure increased to an average of 75,3 ± 6.2 mmHg.

At the end of the experiment in the supine figure heart rate on average, amounted to 62.3 ± 6.1 beats / min, systolic blood pressure was at an average of 122 ± 4.9 mm Hg, diastolic blood pressure on average equal to 73.4 ± 4.1 mm Hg 10 -min standing level of heart rate, systolic blood pressure, diastolic blood pressure (M ± m) on average amounted to 67.7 ± 6.6 beats / min; 124.3 ± 4.9 mm Hg; 74 ± 4.3 mmHg, respectively.

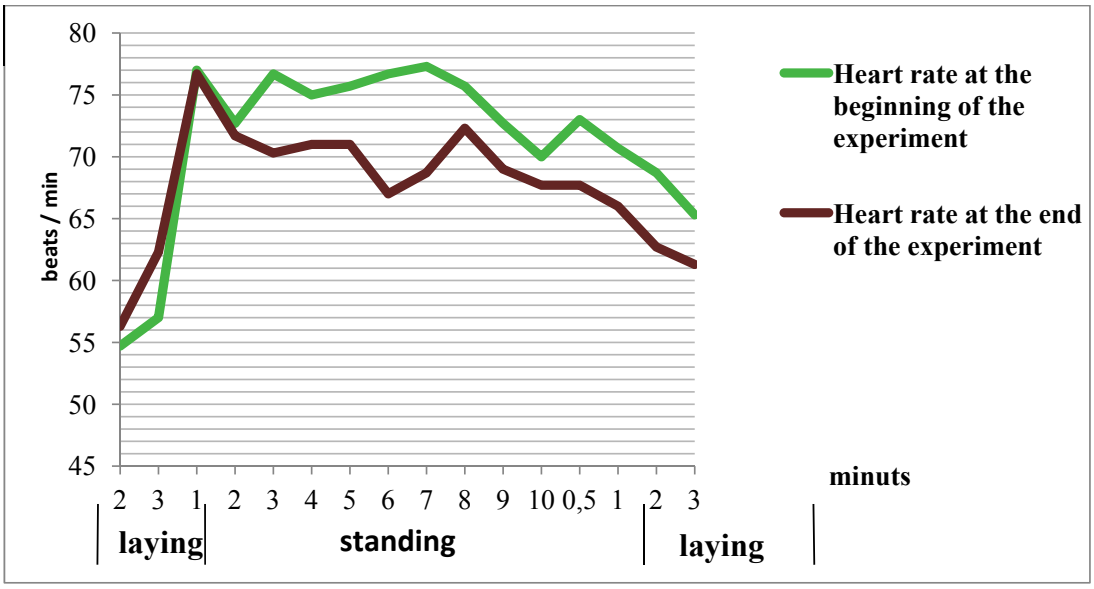

Figure 1 – Dynamics of heart rate in the experimental group of athletes

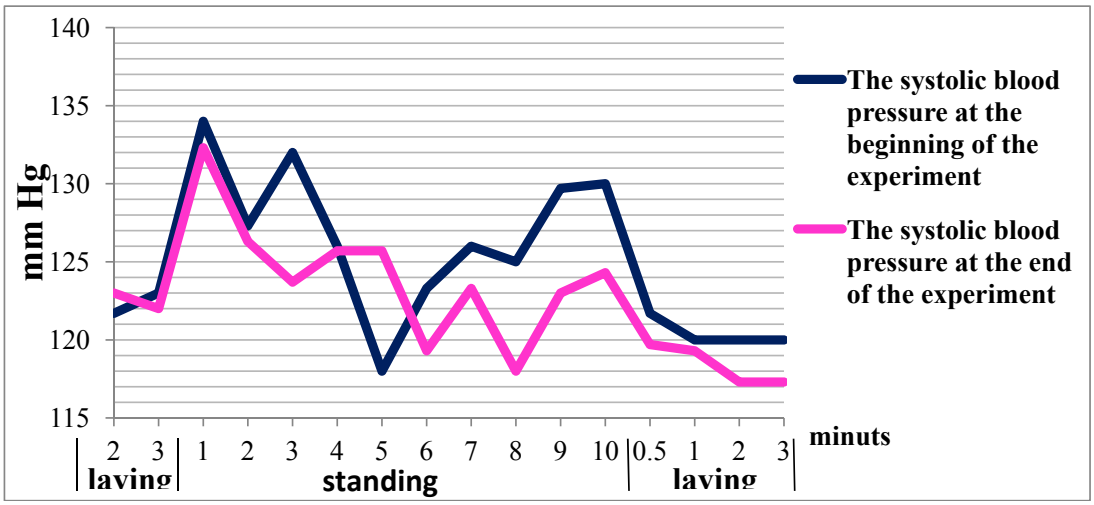

Figure 2 – Trends in systolic blood pressure in the experimental group of athletes

Figure 1 shows the heart rate in the experimental group of athletes at the beginning and the end of the experiment. At the beginning of the experiment at 10-min standing level of the average heart rate rose to 13 beats / min compared with the supine position.

At the end of the experiment to 10-min orthostatic position increase in heart rate by an average of 5.4 beats / min.

Figure 2 shows the values of systolic blood pressure in the experimental group of athletes at the beginning and the end of the experiment. At the beginning of the experiment on the 10 -min standing systolic blood pressure increased by an average of 7 mm Hg compared with the supine position. At the end of the experiment to 10 -min orthostatic position was an increase in systolic blood pressure by an average of 2.3 mm Hg, 4.7 mm Hg less than at the beginning of the experiment.

Figure 3 shows the values of diastolic blood pressure during orthostatic Shellonga athletics experimental group at the beginning and end of the experiment. At the beginning of the experiment on the 10 -min standing diastolic blood pressure increased average 5.3 mmHg compared with the supine position.

At the end of the experiment to 10 -min orthostatic position observed increase in diastolic blood pressure by an average of 0.6 mm Hg, which

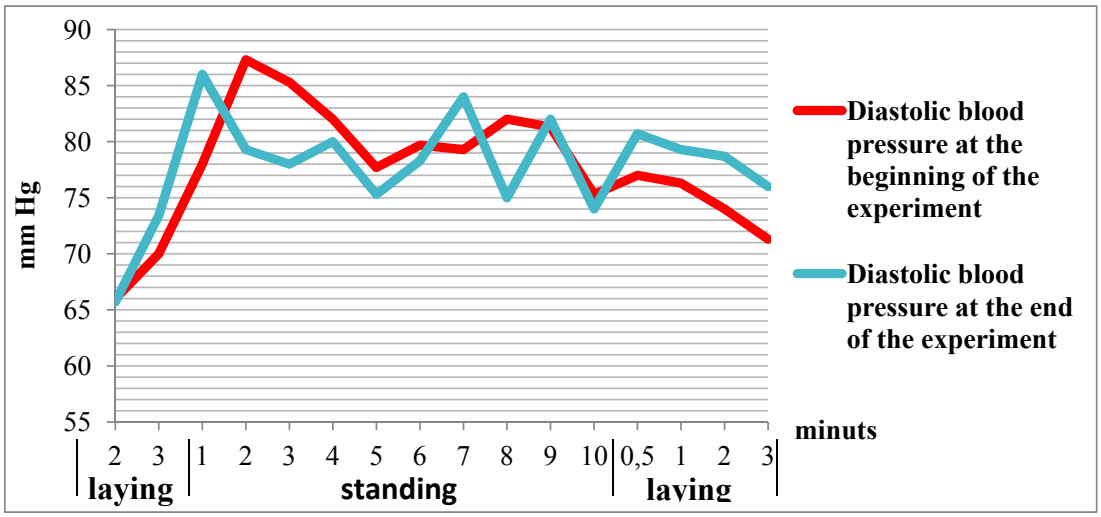

Figure 3 – Dynamics of diastolic blood pressure in the experimental group of athletes

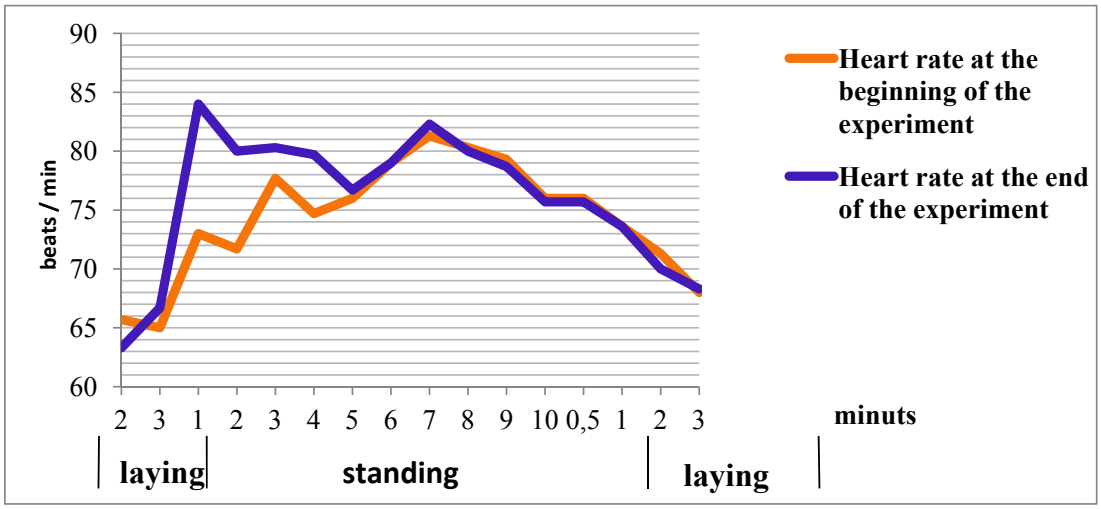

Figure 4 – Dynamics of heart rate in the control group of athletes

is 4.7 mm Hg less than at the beginning of the experiment.

In the control group of athletes following dynamic changes in functional indicators of cardiovascular system were observed. At the beginning of the experiment in the supine position heart rate, systolic blood pressure, diastolic blood pressure (M ± m) amounted average to 65 ± 7.1 beats / min; 106.3 ± 4.8 mm Hg; 60.7 ± 3.4 mm Hg respectively, to the 10 -min standing heart rate rose average to 76 ± 7.8 beats / min, systolic blood pressure index increased average of 115.3 ± 3.1 mm Hg, diastolic blood pressure increased to an average of 68.7 ± 7.4 mm Hg.

At the end of the experiment heart rate at an average rate 66.7 ± 8.5 beats / min, systolic blood pressure increased to an average 104.3 ± 5.8 mm Hg and a diastolic blood pressure equal to 62 on average, 3 ± 9.3 mm Hg, 10 -min standing level of heart rate, systolic blood pressure, diastolic blood pressure (M ± m) amounted average t 75.7 ± 7.4 beats / min; 122 ± 3.3 mm Hg; 76.3 ± 5.4 mm Hg, respectively.

Figure 4 shows the heart rate in control group at the beginning and end of the experiment.

At the beginning of the experiment at 10 -min standing level of the average heart rate rose to 11 beats / min compared with the supine position.

At the end of the experiment to 10 -min orthostatic position observed increase in heart rate by an average of 9 beats / min, which is 2 beats / min less than the start of the experiment.

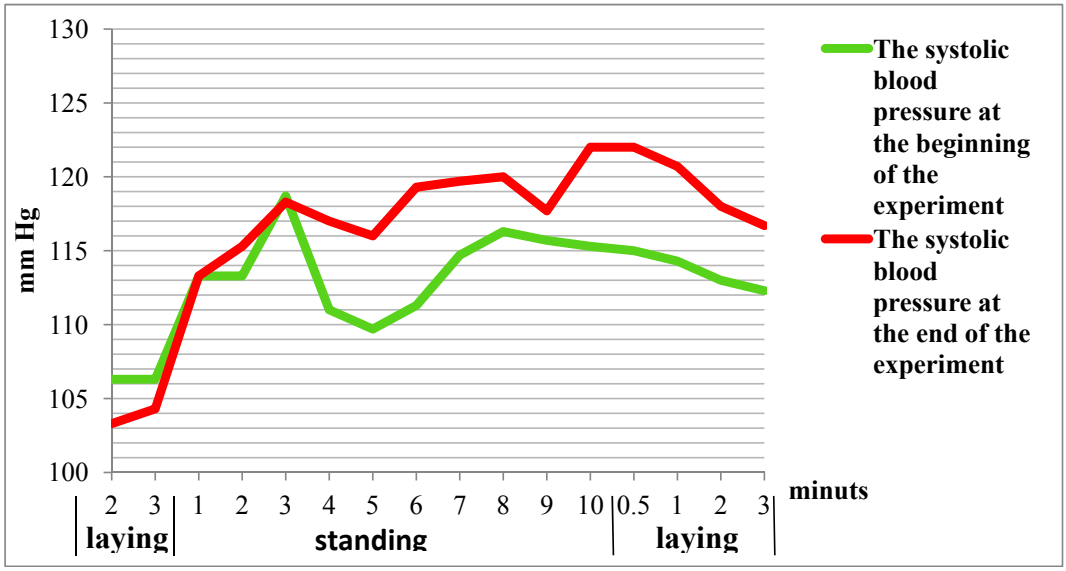

Figure 5 – Trends in systolic blood pressure in the control group of athletes

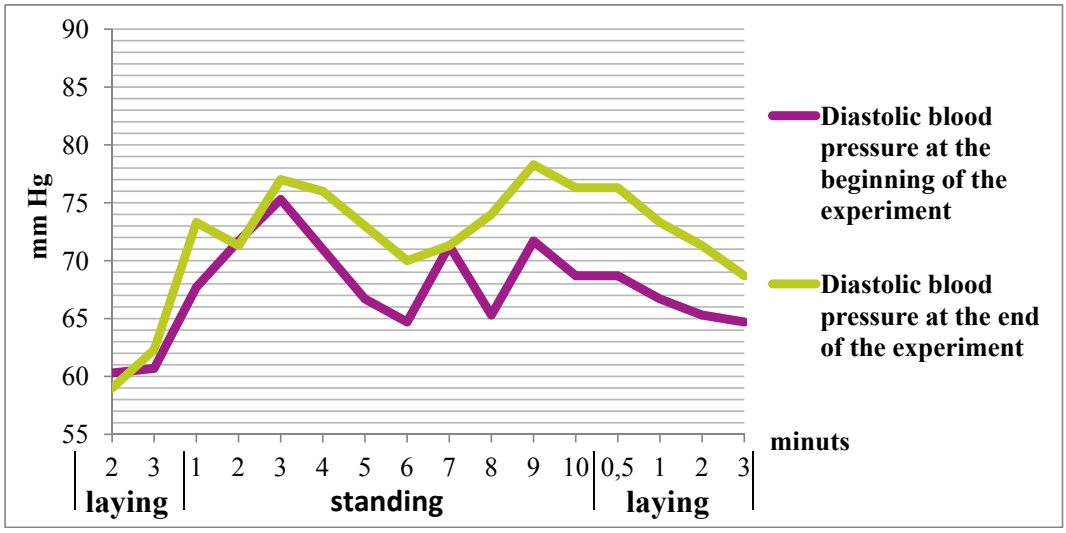

Figure 6 – Dynamics of diastolic blood pressure in the control group of athletes

Figure 5 shows the values of systolic blood pressure during the orthostatic test in athletes control group at the beginning and end of the experiment.

At the beginning of the experiment on the 10 -min standing systolic blood pressure increased average 9 mm Hg compared with the supine position. At the end of the experiment to 10-min orthostatic position in systolic blood pressure increasad average of 17.7 mm Hg, 8.7 mm Hg more than the beginning of the experiment.

Figure 6 shows the values of diastolic blood pressure during orthostatic Shellonga athletes control group at the beginning and end of the experiment.

At the beginning of the experiment on the 10 -min standing diastolic blood pressure increased average of 8 mmHg compared with the supine position.

At the end of the experiment to 10 -min orthostatic position it was observed increase in diastolic blood pressure average 14 mm Hg, 6 mm Hg more than the beginning of the experiment.

From the above data it is clear that in the experimental group athletes at baseline to 10 –min of orthostatic position heart rate increased average by 13 beats / min, pulse pressure increased by 1.9 % compared with the data in the state lying down. At the end of the experiment in the standing the

heart rate increased average by 5.4 beats / min, which was 7.6 beats / min less than the beginning of the experiment , the pulse pressure rose by 3.5 %, which is 1.6% more to the beginning of the experiment. In the control group at baseline to 10 -min orthostatic position observed increase in heart rate by an average of 11 beats / min, pulse pressure increased by 2.2%.

After the experiment, the level of the heart rate to 10 -min standing grew in average by 9 beats / min, what is 2 beats / min less than at the beginning of the experiment, the pulse pressure increased by 8.8 %, what is 6.6 % higher than at the beginning of the experiment. This suggests that both groups of athletes in the normal postural stability observed at the beginning and end of the experiment.

In general due to improve the cardiovascular system sympathetic nervous system regulating, as the looping of aerobic capacity in the preparatory period of training process athletes.

However, after taking "Aiko" in the experimental group, there was a decrease of heart rate 18.2%. Increase of pulse pressure in the experimental group at the end of the experiment was lower 5 % than in the control group, thus biogenic water has a positive effect on the efficiency and adaptability of the organism athletes.

Restoration time of heart contraction frequency decreased in everybody which took "Aiko". Examination of the muscle mass represent increase in sportsmen "5", "6", "7" of the same group. Every representatives of experimental group demonstrated increasing of work ability in training process so as slow down of tiredness manifestation appear.

Conducted experiments give the possibility to say that the preparation on the base of biogenic water has marked biological effect. This effect expresses as a certain change of tissues on cellular and subcellular level that led to change of functional physiological systems characteristics. So far as biogenic water and its preparation don't provokes nonphysiological change of metabolism and regulatory systems it is possible to contend that it don't present doping substance and can be used by sportsmen and person working at extreme conditions.

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