

The influence of natural bio-correctors of oceanic nature on different data of blood biochemistry of sportsmen

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Abstract. The results of investigation on the evaluation of changing data of blood biochemistry of sportsmen during their training are depicted in the article. The process is characterized by having of food supplements produced from raw materials of oceanic origine.

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Introduction

For the modern sport characterized by the fact that the problem is beginning to occupy one of the main places in the training of highly skilled athletes [1, 2, 3]. Properly organized food – one of the most important ways to improve the performance athlete and the confrontation developing in the course of progressive training loads fatigue. In addition, the selection of the daily diet with optimal composite compound food, in many ways provides improve overall health and increase the desire to train, fuse varies from large "technical defects", reduces nervous and emotional stress. Among the substrates (components) that optimize the composition of the diet, give it to the extent possible to carry food natural bio-correctors (FNBK), made from ocean aquatic organisms. In all the countries, the latter are very dainty foods and are often recommended for inclusion in the diet of athletes to improve their performance. Such products include crabs, sea cucumbers, lobsters, squid, sea urchin roe, salmon roe and milt, turtle meat, etc. Made from raw materials data supplements are promising drugs that may be useful in sports [4]. When recognized by all their utility, large-scale implementation of these drugs in the practice of sports nutrition should be based on research supported by the evidence [5]. In addition, one cannot expect that the results obtained in the use of specific FNBK ordinary person, and automatically appears when applied athlete – us when performing strenuous exercise programs.

In this regard, we have conducted research on the impact of the complex FNBK oceanic origin, the nature arising out of metabolic processes in the body of athletes, according to the dynamics of the individual parameters of blood chemistry. The structure of this complex includes the following 6 FNBK drugs (were selected by the medical-pedagogical consultation from a list submitted by the 14th FNBK types of concern "Biopolymers" (Partizansk, Primorsky Krai) and developed by "Pacific research fishery center" (Vladivostok): "Krusmarin" (crab fat from the liver),

"Molluscam" (anti-oxidant in marine bivalve molluscs), "Maristim" (product of sea urchin roe), "Tinrostim +" (polypeptide complex, the received from nerve cells marine organisms), "Artrotin" (product of the cartilage tissue of aquatic organisms), "DNKalgin" (enterosorbent, made from salmon milt and *Laminaria japonica*). In this study were involved in two groups of individuals to 9 people each (students of three Schools in Far-Eastern Federal University (Vladivostok): engineering, natural sciences, economics and management) are fond of cyclic sports (rowing, swimming, track and field running) and have roughly the same level of qualification. In the study, the subjects were encouraged to adhere to a uniform and balanced diet: 55,0-65,0% carbohydrates, 15,0-20,0% – proteins, 15,0-20,0% – fat. Athletes who became members of the experimental group twice a day (in the morning at breakfast and in the evening during dinner) for 4 weeks, additionally taking the proposed set FNBK. The volume and intensity of training loads due to specific sports specialization in both groups (each of them is presented by representatives of the previously mentioned sports) were unified in direction of impact (power, speed, speed-strength, endurance) and reached at this stage of training regarding higher values. Biochemical blood test performed in the clinical diagnostic laboratory medical center "SANAS" (Vladivostok).

Knowledge of biochemical control allows seeing functional state, which reflects the character of its adaptation to training programs. In other words, the purpose of biochemical control in sport is performance management training process. This type of control has long been a mandatory attribute of the athletes training support teams in various sports. The lack of proper control over biochemical processes in the body stems athletes usually leads to a reduction of their potential capabilities impairs motor performance [6, 7]. Table 1 below presents the variation some blood chemistry indicators showing the features of the metabolic processes in the body of students – athletes taking and

not taking FNBK. In the course of biochemical studies conducted in capillary blood (the fence in the morning, alone, on an empty stomach of the ring finger) using an automatic analyzer determined by such factors as: lactate, urea, hemoglobin, pH, alkalinity reserve (BE). The choice of these parameters was dictated by the finding that they are most often used, when evaluating the results of such studies orientation: assessing the effectiveness of the diet [8, 9, 10]. Analyzing the data in table 1 should be noted that in the four cycles study period (training) was set slightly different behavior of the studied parameters in groups.

Table 1. Selected indicators of blood chemistry, registered (at rest), the students who took (EG) and not taking (CG) FNBK

Defined parameters	Group	The values of parameters (M±m)		The resulting differences between groups (%)	Reliability the outcome of intergroup differences (P)
		source	after 28 days		
Blood lactate, mmol/l	KG	2,00 ± 0,06	2,11 ± 0,05	9,00%	< 0,05
	EG	2,14 ± 0,07	1,92 ± 0,05		
Concentration urea, mmol/l	KG	4,84 ± 0,21	6,64 ± 0,25	1,21%	> 0,05
	EG	5,00 ± 0,16	6,56 ± 0,28		
pH	KG	7,38 ± 0,01	7,44 ± 0,01	0,54%	> 0,05
	EG	7,36 ± 0,02	7,40 ± 0,02		
Hemoglobin, g/l	KG	140,2 ± 1,3	142,3 ± 4,2	6,39%	< 0,05
	EG	143,3 ± 1,9	151,4 ± 2,8		
BE blood, mEq/l	KG	- 0,72*	+ 0,16*	is more than 9,5 times	< 0,05
	EG	+ 0,68*	+ 1,53*		

Note: * – sets forth the median (Md) in connection with the analysis of characteristics having both positive (+) and negative (-) value.

And, as the most favorable, it should be recognized in patients taking FNBK. Especially significant differences between the groups were established by such indicators as blood hemoglobin, BE (indicator of excess or lack of buffer capacity of the blood – alkaline reserve), the concentration of lactic acid. Totals (fairly significant) between-group differences in magnitude of hemoglobin in the blood accounted for 6,39%, and the concentration of lactate in the blood – 9,0%. In terms of the alkali reserve of blood (BE) by the end of the test phase of training and life in general, the compositions groups differed by more than 9,5 fold (P<0,05). According to the content of hemoglobin in the blood can be seen on the aerobic capacity of the organism, the effectiveness of aerobic exercise programs focus and the health of athletes in general [5]. The increase in hemoglobin in the blood (in the norm of its concentration must reach men 140-160 g/l) to a certain extent reflects the degree of adaptation to physical stress. In this case, a marked increase in hemoglobin levels in the experimental group members, we can probably be attributed to receiving proposed biocorrectors multicomponent kit. For quantities BE, it should be said that he (reserve) is the most informative indicators of acid-base balance

blood. Normally, its value ranges from - 2,4 to + 2,3 meq/l. Large quantities of buffer reserves of the body, including BE, are a very important prerequisite for improving athletic performance. Smaller quantities of lactate in the blood of athletes in the performance of an equal amount of load can be regarded as solutions improve fitness, increase anaerobic-glycolytic capacity of the organism. That's how we interpreted and changes of lactate in the blood of athlete's experimental group. The program of this study we have provided analysis of changes in selected biochemical parameters under the influence of bicycle exercise test to the load offered to them after completion (test of Nowacki, 1978). This load (single, to overflowing, with gradually increasing capacity) performed with a frequency of pedaling is 60 rev/min. In the test of Novacki achieved a certain unification of the power given by the naked manual ultrasonic inspection: initial load of 1 watt per kilogram test every 2 minutes increased by the same amount as he did not refuse to perform a given job [11]. Such load model consistent with the recommendations of World health organization and recognized by many experts. The dynamics of biochemical indicators in the bicycle exercise naked manual ultrasonic inspection and recovery period provides the necessary information about the health, status of functional systems, response to physical stress and flowing of the recovery processes [1]. The effects of exercise on test-study mended indicators are presented in table 2. The students – athletes taking FNBK, he proposed to carry the load (comparable in external parameters) led to the achievement of less than the gain of the concentration of lactate in the blood, to a less pronounced change in its buffer capacity (BE) and pH. They also had a greater accelerated normalization of biochemical changes during the recovery after the load.

Detail analysis of the data in table 2 allows you to add as follows. At the time of failure of the bicycle exercise load, the difference in content of lactate between the groups of students was 12,5% (P<0,05), with at its value at the test finding under the influence of the pilot factor (reception FNBK). More pronounced in this group and has been a tendency to return (to the rest period) of the biochemical index to a value very close to normal.

In this between-group difference in the levels of blood lactate concentrations at the specific moment of testing (20th minute rest) was 7,6% (P<0,05). It is very significant, and it has found statistical evidence, a group of subjects differed in terms of BE blood by the end of the set time of recovery. By the 20th minute of rest alkaline reserve (BE) in the blood of persons were part of the experimental group was on average equal to -2,7 mEq/l, and those who did not take PNBK - +1,78 mEq/l. More positive in the experimental group (the

end of a given period of recovery) was the speaker and return to normal (equal to 7,35-7,45 units) of blood pH: in the experimental group at the end of the 20th minute, it has already reached the normal (was 7, 42 units), and in the control it is not yet adequate (units was equal to 7,39). The latter corresponds to the state compensation acidosis (a form of acid-base balance). These biochemical control for student – athletes, bringing PNBK were in a certain relationship with the statements (based on observations) coaches about their positive impact on the portability of training loads and increasing the level of physical fitness. The latter was confirmed by the data of pedagogical testing the subjects in both groups spent on the complex program (running at 100 and 1000 meters, long jump from their seats, pulling on a high rung). Evaluation of the results of this test indicates that the test of the experimental group who took FNBK, in the completion of the study scored in the form of a sum equal to the all-around 72,0±1,8 points, and the athletes of the control group – 64,0±2,2 points (the difference was 12.5%; P <0.05). At the beginning of the study, the results of a similar test groups did not differ significantly.

Table 2. The nature of changes in indicators of blood chemistry students taking (EG) and not taking (CG) FNBK part of the standard bicycle exercise load

Data	Test period	Group	Measurement conditions		P	P	For 20 minutes of rest (M± m)	P	
			At rest (M± m)	P					
pH	initial	KG	7,38±0,012	>0,05	7,26±0,013	>0,05	7,36±0,009	>0,05	
		EK	7,36±0,016		7,29±0,008		7,38±0,008		
	final	KG	7,44±0,014	>0,05	7,26±0,014	>0,05	7,30±0,012	>0,05	
		EK	7,40±0,016		7,28±0,010		7,42±0,009		
	BE blood, mg/dl	initial	KG	0,72*	>0,05	-10,4*	>0,05	-2,36*	>0,05
			EK	-0,68*		-10,6*		-2,40*	
final	KG	-0,16*	<0,05	9,32*	<0,05	2,70*	<0,05		
	EK	1,53*		-9,00*		1,78*			
Blood lactate, mmol/l	initial	KG	2,00±0,06	>0,05	10,78±0,52	>0,05	2,56±0,28	>0,05	
		EK	2,14±0,07		11,20±0,46		3,00±0,22		
	final	KG	2,11±0,05	<0,05	11,38±0,17	<0,05	2,38±0,15	<0,05	
		EK	1,92±0,05		9,56±0,22		2,20±0,09		

Note: * – sets forth the median (Md) in connection with the analysis of characteristics having both positive (+) and negative (-) value.

Completing the description of the data obtained in the course of the experiment is possible to draw a conclusion that the proposed complex food biocorrectors can be assigned to a group of products that have value to the sports activity the consumer properties. It has a positive effect on the performance of athletes, affecting the nature of the flowing of the

metabolic processes in the body. All this is to some extent contributes to the functional back-up of athletes, ensuring the reduction of risk of disruption of their adaptation to physical stress.

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