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Preliminary research on biochemical investigations of the naval pentathlon team from the Naval Academy "Mircea cel Batran" – seamanship sample

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Abstract: In the study we underwent research a series of biochemical parameters (hemoglobin, proteins, lactic acid), which condition the physical effort. The proposed biochemical investigations were conducted in preliminary research at baseline and end point. By applying these lab investigations, I followed: 1. if the results obtained fall within the normal limits proposed by medical specialists; 2. to what extent the investigative values obtained are influenced by the complexity of the pentathlon complex. The results obtained in the two tests were statistically processed (tabular and graphical) and analyzed between the samples investigated in the two tests.

1. INTRODUCTION

In biochemical investigations, I turned to conducting specific sample in the laboratory specializing in medical analysis. In the tests was carried out analysis: hemoglobin; protein; urea; lactic acid. The results recorded in the laboratory have been interpreted medical laboratory specialist biologist specialized Naval Medicine Center, Constance.

HEMOGLOBIN was determined through Shali method. The apparatus used was hemoglobino meter, consisting of Shali: support work, which has two lateral stained glass rod Brown, corresponding to the color of a solution of 1-hematin in glycerine; in the middle of the mount, a place for the tube where it will read the hemoglobin. It has the same dimensions as the side tubes, being on the one hand with values between 2-25 (Hb-grams percent). On the other side tick marks presents values between 10-160 (Hb-percentage). The results constitute the physiological elements of hemogram, which varies according to age, sex, degree of training. These results are interpreted according to the value of normal erythrocytes tables and hematocrit in different ages, existing in specialised laboratories.

PROTEIN were determined by the method electrophoresis became the most accessible method in laboratory examination. Electrophoresis It is a method which is based on the speed of the migration in electric field of proteins at a constant Ph. The method consists in applying the serum portion in the form of drop or stripe on a filter paper soaked with buffer solution, placed in an electric field. Under the electric field applied voltage at the ends of the strip of paper separate factions that are components of a specific coloring. Colored spots can be evaluated quantitatively by fotometrare or by Elution.

Electroferetical analysis allowed the interpretation of the results obtained in the light of the existing physiological reference grids in the laboratory.

UREEA it was recorded with the help of urodensimetr Kowarski, consist of a glass tube bent into the shape of a „U”, referred to in both arms with valves. The reagents were use of trichloroacetic acid solution (10); Kowarski solution (150 g 350 g potassium sulphate, sodium chloride). Decomposition of urea process begins with the opening of the taps, leaving free passage to 5cm³ solution. It wait 10-15 minutes for a full clearance. Read the volume of the gas, and the value is multiplied by 2. The results are interpreted according to the physiological laboratory in existing grids.

ACIDUL LACTIC represent the end product of muscle (TCAC), being used for the measurement of the biochemical capacity of exercise, both aerobic and anaerorbic. High levels of blood lactate, which is a limiting factor of performance was determined in the laboratory with the aid of special equipment for the determination of acid-base balance during training. The results were reported at the existing metabolic estimate. Normal value = 0,7 - 1,8 mMol/l (turnover multiplied by 9,1 = values expressed in mg%. The blood lactate concentration was analyzed after exercise (treadmill 8 km in varied terrain). Depending on the variation of lactate was capillary resistance, tolerance to acidosis as follows: values in 6 minutes, after higher effort by 12 mMol/l = poor tolerance to acidosis (so it can be trained to grow).

2. METHODS AND INVESTIGATION

Hemoglobin-the first parameter is subjected to research or a conjugated protein heteroproteină, which gives the main function of the erythrocyte O₂ transport agents, composed of a fraction which contains iron pigmentosa called *hem* and a protein fraction, histonelor class, called globină (molecular weight of hemoglobin is 68,000-heme constitutes 4%, and globina 96%). From the calculation of the average difference between the significance to the final testing, between the two samples, there is a significant difference, where t is expressed as the amount of 2,38>2,13 the degree of freedom n-1, p=0,05. Knowing that in terms of quantitative hemoglobin is circolantă 600 g-800 g, and physiological mechanism of formation of oxihemoglobinei takes place at the level of the pulmonary capillaries, O₂ to tissues, we believe that the results significant obtained sample experiment are truthful.

Proteins represent the second parameter value studied organic and through the critical protein have index in physical effort. In accordance with the scale of values of this parameter standard physiological (6,5 – 7 g%), note that the initial testing (table 1), the environments are relatively close values (6.5 g% for group a witness and 6.4 g% group experiment).

Table 1.

Comparative analysis of the media group that characterize biochemical investigations of military athletes tested itially in preliminary research

Nr. Crt.	Compare parameters	$\bar{X} \pm m$		Criteria	
		Group witness	Experimental group	“t”	“p”
1	Hemoglobin (grams %)	13,60 ± 0,11	14,00 ± 0,07	0,95	>0.05
2	Protein (grams %)	6,50 ± 0,03	6,40 ± 0,04	2,00	>0.05
3	Urea (ml%)	360,00 ± 3,08	355,00 ± 3,85	1,01	>0.05
4	Lactic acid (ml mol/l)	10,60 ± 0,07	10,50 ± 0,06	1,11	>0.05

Table 2.

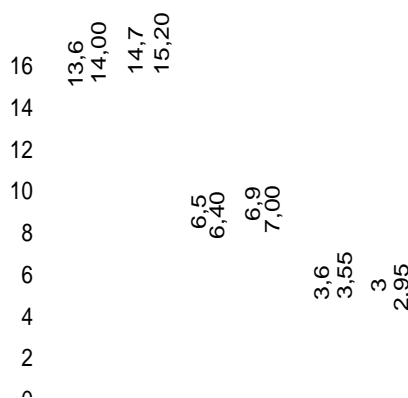
Comparative analysis of the media group that characterize biochemical investigations of military athletes tested final in preliminary research

Nr. Crt.	Compare parameters	$\bar{X} \pm m$		Criteria	
		Group witness	Experimental group	“t”	“p”
1	Hemoglobin (grams %)	14,70 ± 0,15	15,20 ± 0,15	2,38	<0.05
2	Protein (grams %)	6,90 ± 0,04	7,00 ± 0,04	2,00	>0.05
3	Urea (ml%)	300,00 ± 2,31	295,00 ± 2,69	1,41	>0.05
4	Lactic acid (ml mol/l)	10,00 ± 0,06	9,90 ± 0,06	1,25	>0.05

Given the fact that the need for protein protein required quantity on the body within 24 hours, in order to cover its requirements, we note that the final testing environments to this parameter values grow. Although this test is the difference between the average values is insignificant (t is $2,00 < 2,13$, to $p=0,05$), from physiological point of view, the value $7,00$ g% obtained sample experiment, expresses the fact that the muscular effort claimed he ingested protein degradation involved and those for energy supply needed muscle effort. Urea comes from combining ammonia resulting from the dezaminarea of amino acids with the CO_2 resulting from degradation of carbon chains of carbohydrates, lipids and proteins.

Biochemical parameter choice – urea – in this investigation is motivated by the fact that although anabolismul and catabolism processes are diametrically opposed to each other, intercondition, any synthesis is achieved at the expense of the energy released by the decay of certain substances. Starting from the premise that the biochemical reactions, characterised generally releases energy determines the final degradation products (CO_2 , H_2O , urea, uric acid, creatinine), which is eliminated by urine, notice (table 2) that the initial testing averages the values recorded ($360,00$ g% - group witness; $355,00$ g% - experimental group) fall in the proposed biochemical specialists academics of this parameter.

The final values gradually decrease media group witness recording $300,00$ g%, and experimental group $295,00$ g%. The final calculation of the difference between the average between the two samples is insignificant to the $p=0,05$ (t has value $1,4 < 2,13$). The absence of statistical significance at this test expressed that for subjects batch experimental potential chemical energy stored in food and substances released by catabolic reactions is converted into energy by the cells (muscular contraction) and osmotic energy (retroresorbție activity of renal tubules cells) as a result of the exercise of the workout on the coordinates of a system optimal preparation. The results of the two samples investigated were processed statistically and plotted (graph 1).



Graph 1. Dynamics of biochemical investigations results in preliminary research

Lactic acid, the deadline of the degradation of glycogen and glucose cycle Embden-Meyerhoff was elected in research for the determination of the energy levels in the tissues does not have at its disposal the required oxygen during exercise specifically. Considering the fact that all the reactions involved in the cycle of Embden-Meyerhoff are reversible, which makes possible the resintetizarea of glucose and glycogen from lactic acid, we consider that these amendments to the final testing of the average values obtained are improved due to the specific effort well dosed. Thus, the muscle contractions were conducted under conditions of good oxygenation ($1/5$ from lactic acid is degraded in the Krebs cycle, up to CO_2 and H_2O , energy release and the rest of $4/5$ is retransformed in glycogen).

Title

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