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RESEARCH ARTICLE

IMPACT OF SPORTS EFFORT ON ZINC ELEMENT

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ABSTRACT

The purpose of the present research was to compare a serum zinc concentration before and after acute exercise. The sample of the research consisted of 14 physical education students of Diyala University with the experience of participating in national long-distance track events who voluntarily participated in the study (23.00 ± 1.78 years old; 174.36 ± 6.24 cm height; 66.58 ± 5.76 kg weight). The exercise loads were performed with 1 days interval. Before, and after test Serum zinc of the participants were measured. In addition, blood pressure, of the participants were calculated before and after exercise. The data was analyzed in SPSS 13. The mean and standard deviation of all the variables were calculated. T test was applied to examine significant differences between the variables. A significant difference was observed in serum zinc of the participants before and after exercise. Also, there was elevated in high pressure after exercise. Negative significant correlation ($P < 0.05$) was found between the concentration of zinc and high blood after exercise

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INTRODUCTION

The element zinc

The element zinc is considered to be one of the most important mineral elements needed by the human body to the number of enzymes, which need zinc as an escort of the enzyme to work is three hundred enzyme. It's also vital for the work of the immune system appropriately⁽¹⁾. The element zinc is absorbed in the stomach Mostly in the upper part of the small intestine at the rate of (12 – 59 %) according to the availability of vector proteins⁽²⁾. The adult human should obtain (15) mg approximately of the element zinc daily through food.⁽³⁾

Effort sports, and zinc

Is some evidence that the level of the element zinc decrease with high stress and physical. For example, lead exercises violent To loss amount of element zinc, may be because of the increase in the consumption of glucose Which requires the presence of zinc by forces player Because they are more vulnerable to the decrease in the element zinc⁽⁴⁾. Researchers study on Twelve football players to explain What is the relationship between the concentration of zinc and blood flow at the time of the rest and after exercise , they presence of a decrease in the concentration of zinc after exercise for the rest⁽⁵⁾. As well as said the researchers (Colin *et al* 2004) at the University of Baylor in the United States of America, In the

study by giving a dose of Zinc Magnesium Aspartate (ZMA) For the fourth twenty to the player weights when your exercise to know the extent of the effect of physiological zinc⁽⁵⁾. Confirmed a study conducted recently in Brazil at the University of *Rio de Janeiro State*, on the extent of the response to the concentration of cortisol, leptin, and zinc, for continuous training the absence of a change in the concentration of zinc⁽⁶⁾

The sports effort and blood pressure

Researchers discovered in a new study conducted recently, that sport does not reduce arterial blood pressure high in the period after the exercise directly, but keeps it low within the limits of the natural for more than 22 hours. The researchers said that people with high blood pressure are at risk of higher heart disease risk and stroke. The studies have proven that sport tracks in an immediate reduction in higher blood pressure but it is not clear if these tracks stay in place for longer periods until came the new study to confirm that the decrease in blood pressure resulting from the sport lasts for the whole day⁽⁷⁾

Researchers at the University of Saone Paulo, Brazil explain in studies towards the 42 patients elderly suffer from high blood pressure and 18 other non-infected, when combined with the shares of a light 45-minute used in which Cycling sports fixed and have undergone inspections and tests special to determine the effect of sport on blood pressure and other physiological factor. They found that sport reduce blood pressure, influence

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positive on a number of important factors associated with health-heart attack good. Researchers concluded in the study published by the Journal of the College of American science heart to need to recommend that doctors patients the pressure the elderly to exercise kinetic light daily, to maintain blood pressure within its normal limits continuously⁽⁸⁾. As emphasized by some researchers in studies relating to the impact of the effort sports on sports, the Iraqi high pressure blood after training to players average distances of running 800-150m.⁽⁹⁾

MATERIAL AND METHODS

Subjects and sample collection

The subjects of the research consisted of 14 physical education students of Diyala University with the experience of participating in national long-distance track events who voluntarily participated in the study (23.00 ± 1.78 years old; 174.36 ± 6.24 cm height; 66.58 ± 5.76 kg weight). The exercise loads were performed with 1 days interval. Blood samples were collected by vein puncture using 5ml disposable syringes. Where the withdrawal of blood from a sample before the effort (in the case of the rest) the blood was centrifuged at(3000 rpm) for 15 min after allowing the blood to clot at room temperature. The sera were aliquot to assay. After the training, distance 1500-3000m was the withdrawal of the blood. In the same proceedings for the withdrawal of blood before the effort the blood was centrifuged at(3000 rpm) for 15 min after allowing the blood to clot at room temperature. The sera were aliquot to assay.

Assays

Measurement of Body Mass Index (BMI)

BMI uses a mathematical formula based on a person's height and weight. BMI equals weight in Kilograms divided by height ⁽¹⁰⁾ i n square meter (BMI=Kg/m). [WHO; and Fost] suggested that a BMI of 18.5–24.9 indicates a person of normal weight. A person with a BMI of 25–29.9 is overweight, while a person with a BMI of 30 is obese

Measurement of blood pressure

Blood pressure was measured indirectly by auscultation (listening to sounds) described in 1902 by Russian physician N.S.Korotkoff, using a stethoscope and sphygmomanometer (SK-MINIATUR300B- Germany) consisting of a blood pressure cuff and a mercury column pressure gauge ⁽¹¹⁾. Both systolic and diastolic blood pressure was recorded in mm Hg

Measurement of zinc concentration

The concentration of zinc has been measured in the serum by treatment chemically through kit. Calculate the ratio of the concentration of the zinc in the blood to the spectrophotometer. the samples measured at a wavelength (560 nm), as the concentration of zinc according to the formula of the following Zink Concentration (µg/dl)= Specimens/ Astandard ×200

Statistical Analysis

Descriptive statistics

Summary statistic of the reading distribution (mean, SD, and Variation coefficient).

Inferential Statistics

These were used in order to accept or reject the statistical hypothesis, they include the following:

1. student t-test for independent samples was used to test the difference in mean between two groups
2. P value equal and less than 0.05 was used as the level of significance

Computer and Programs

All the statistical analysis was done by using Pentium-4 computer through the SPSS program (statistical packages for social sciences version-11) and Excel 2003.

RESULT AND DISCUSSION

Table (1) shows the extent of homogeneity between the subjects of the research, it is clear that the variation coefficient of the variables less than (25%). This means that the research sample homogeneous among themselves⁽¹²⁾

Table (1) show (mean, SD, and Variation coefficient) to variable (age and BMI)

Variation coefficient	SD	Mean	Variable
7.83%	1.81967	23.2143	Age
9.05%	2.239	24.6836	BMI

Table (2) showed that The value of the variation coefficient for metal zinc amounted to (73.5%) It's the largest of 25%. ⁽¹²⁾ This indicates the presence of the significant difference in the concentration of zinc before and after the effort (p<0.05).

This difference in the element zinc may be to the immediate response incident as a result of physical exertion on research sample, through deficiency of zinc in the blood within the normal level due to the loss many quantities in sweating. Also external factors affecting the proportion of zinc, Whenever ,the temperature rose increased sweating so the loss in the amounts of zinc.

Our study has same result as (S.Khlad, J.F, et al) study ⁽⁵⁾, they found that zinc concentration low after exercise. Also table 2 shown the mean of diastolic blood pressure before and after the effort is (7.2, 9.3) respectively and the mean of systolic blood pressure before and after the effort is (12.7, 16) respectively, the differences were no significant statistically at (P<0.05). But there was an increase in systolic and diastolic blood pressure compared with normal value this increase may be to higher stress ⁽¹³⁾. These results are similar to the observations of other investigator, Falh mahfoth (2000) observed that elevated blood pressure in players average distances of running 800-150m after training⁽¹⁴⁾.

Table (2) show (mean, SD, and Variation coefficient) to variable before and after effort

Variable	Before effort		After effort		Variation coefficient	Comparing by significant
	Mean	SD	Mean	SD		
Zinc concentration ($\mu\text{g/dl}$)	83.5	58.3765	53.0571	68.2857	73.5	P<0.05
DBP	7.5	1.34	9.5	1.43	16.9	P>0.05
SBP	13	2.03	16	1.02	11.13	P>0.05

Significant difference using student's t-test for comparing between two independent means at 0.05 level of significance

In table (3) there were no significant correlations observed between zinc level and (age, BMI ,SBP, and DBP in subjects before training ($r=-0.008, p>0.05$), ($r=0.126, p>0.05$) respectively, There were negative significant correlations between serum zinc level and SBP in subjects ($r=-0.783, p<0.05$) after training as shown in table and (3). As in most of the time Zinc does not affect high blood pressure on the contrary where it causes relaxation of the vascular but in this case it would be natural to increase the pressure because of the effort sports⁽¹⁵⁾

Table (3) The correlation between serum zinc ($\mu\text{g/dl}$) and variable before and after effort

serum zinc ($\mu\text{g / dl}$)		Correlation	Variable
After effort	Before effort		
0.234	0.342	R	Age
0.426	0.53	P	
0.147	0.68	R	
0.304	0.409	P	BMI(Kg/m ²)
0.079	0.119	R	
0.390	0.342	P	
0.040	0.055	R	SBP
0.446	0.426	P	
0.531-	0.566	R	
0.025	0.18	P	DBP
0.437-	0.544	R	
0.059	0.22	P	

Correlation is significant at the 0.05 level

CONCLUSIONS

1. The element zinc is affected by the physical effort
2. systolic and diastolic blood pressure effected by the physical effort

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Recommendations

1. The need for attention to the measurement of the element zinc with the blood pressure periodically to the athletes
2. Must be emphasised to the athletes intake of food that contains a zinc

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