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Changes of Cholesterol and Triglyceride in Human Serum After the Aerobic Activity

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Some specialists supposed that cholesterol and triglyceride could play an effective role in creating cardiovascular diseases. But, in spite of the numerous researches in the field, the question of whether or not triglyceride can lead to cardiovascular disease is still there. Instead, cholesterol has been recognized as a deleterious factor. Medical research findings indicate that there is a strong relationship between too much cholesterol in the blood or cholesterol serum and the possibility of heart coronary disease. In the present study, 15 male physical education students with average age of 24.2 ± 2.17 and average weight of 64.93 ± 5.12 kg and the average height of 171.6 ± 5.69 cm voluntarily participated in this quasi-experimental research. They were then formally invited to take part in the experiment by the specialists. Given the fact that the observed triglyceride (2.560) was found to be smaller than the critical triglyceride (2.997), it can be concluded that an aerobic activity (a single-session, 20 min jog) leads to no meaningful changes in the blood cholesterol rate. After activity, the blood serum cholesterol rate of athletics had increased 3.74 % in comparison with the blood serum cholesterol rate before activity. Furthermore, observed triglyceride (0.95) was smaller than critical triglyceride (2.997). It can be concluded that an aerobic activity leads to no meaningful changes in the blood triglyceride rate. After activity, their blood serum triglyceride rate had increased (3.44%) in comparison with the blood serum cholesterol rate before activity. There was no the acceptable correlation between their relative weight and their triglyceride and cholersterol rate. The obtained correlation (Pearson coefficient of correlation) computed at cholesterol rate and their relative weight in fasting conditions was (0.403) and also triglyceride and their relative weight (0.491). It can be concluded that there is an average correlation between measured factors and their relative weight.

Key Words: Cholesterol, Triglyceride, Human serum, Aerobic activity.

INTRODUCTION

A well known French physiologist, Majendi did his experiments upon animals by olive oil injection in 1842. He, in fact, did it due to finding the way for vein nutrition and he then perceived fatty globules were trapped by capillaries after animals death. Holosoroni and his colleagues realized

that some changes in blood fatty acids arise from exercising activities. Utilizing the extra fatty, creating the calorie modulation and decreasing the blood cholesterol and triglyceride can be obtained by these exercises. Studies have shown the fact that high amount of hyperlipemia and hypertension (blood pressure) can be considered as two main factors causing the arteriolosclerosis disease. According to this study, the possibility of infecting to disease for the man whose age is 30-49 with blood cholesterol rate of 240 mg will be 2.6 time more than as his blood serum cholesterol rate is 200 mg.

Another study shows the fact that, in comparison with untrained adults, the athlete hyperlipemias was considerably low. In addition, the triglyceride and cholesterol rate of endurance runners was also lower than speed runners[1].

Due to the energetic value, fatties are considered as the main importance in food portion. The energetic value of fatties equals two time more than carbohydrates and proteins and also equals 9 calories for 1 g fatty. Fattis are saved as energy in the body. In normal nutrition condition, about 20-25 % of our needs calorie provides by the fatties. Then, our body in adequet food portion needs 3000 calories about 66-83 g fatty. If the need for calorie increased about 30-35 % total energy would obtain through fatties[2]. International investigation council (I.I.C.) recommended that only 30 % of required fatty in a food diet for having rich health. The study of food diet shown the fact that carbohydrate in adequate or low amount, protein in adequate or high amount and fatty in high amount would be necessary for endurance athletes[3].

Studies show the fact that by doing exercise, blood serum triglyceride and cholesterol remained without changes. Another study shows that in comparison with adults, blood fatties rate of athlete was remarkably low. Moreover, cholesterol and triglyceride rate of endurance runners was lower than the speed runners[1]. Darbani[4] compared athlete serum cholesterol rate with non-athlete serum cholesterol rate. He concluded that cholesterol rate in athlete was lower than cholesterol rate in non-athlete. But, the difference between them was not considerable.

Fox and Mathews, the famous researchers of physical education, performed some research about exercise which emphasize the decreasing of the deleterious cholesterol (LDL, VLDL) and the increasing of the useful on (HDL).

This point revealed that a fatty diet rich would lead to accelerate the possibility of arterolosclerosis. Continuous increase of triglyceride and cholesterol rate in the blood would require balanced diet and treatment. Several factors such as (smoking, obesity, physical inactivity) would cause to decrease (HDL). These factors would easily be improved by no

treatment. A full diet of animal saturated fats containing lots of cholesterol would increase blood cholesterol. Replacement of these fats with unsaturated fats would cause to decrease cholesterol and triglyceride's viscosity[5].

EXPERIMENTAL

The participants were 15 male students of physical education. The subjects have more than 3 years background in different field with average of 24.2 ± 2.17 and average weight of 64.93 ± 5.12 kg and have average height of 171.6 ± 5.69 cm voluntary participation in this quasi-experimental research (Table-1).

TABLE-1
SUBJECT'S DESCRIPTIVE CHARACTERISTICS IN EXPERIMENTAL SESSION

Variables	N	$\overline{X}$	SD
Age (Year)	15	24.20	2.17
Height (cm)	15	171.60	5.69
Weight (kg)	15	64.93	5.12
Systolic blood pressure (rest state)	15	9.57	1.18
Diastolic blood pressure (rest state)	15	6.97	0.59

Since, the measurement of the blood should be performed at least 8 h after the last using meal[6]. Therefore, in this research blood letting carried out in fasting condition. Furthermore, all the subjects were recommended that should not consume drug at night before test.

In the morning on the test day all the subjects were ready. The process of test performance was explained by a specialist. During the research, some factors such as weight, height, heart beat, blood pressure were measured twice and 5 cm^3 blood were taken from them and kept under labratoary conditions (Table-2). Then the subjects were asked under pre-determined conditions run 400 m track and field for 20 min until the subjects run around the track inclusively eight rounds. In order for more precise measurement of the heart beat of the participants the first subject entered into the track and began to run after letting him. After running the first round of the track within 2.5 min, the second subject entered into the track and term continued until the first subject finished the eight rounds in 20 min. At the end of each of stage heartbeats were counted and the blood letting carried out. The second subject finished this task after 2.5 min. The above mentioned case was performed on each subject after finishing one running in 2.5 min (Table-2). The blood samples were carried out to the laboratory and triglyceride and cholesterol rate were measured. It is necessary to say that in this stage, auto-analizer used in order to analyze the blood samples.

TABLE-2
CHARACTERISTICS OF PRESSURE, ACTIVITY, TIME AND HEART BEAT REACTION BEFORE AND AFTER PHYSICAL AEROBIC ACTIVITY IN THE DAY OF EXPERIMENT

Variables	N	$\overline{X}$	SD
Certain exercise (m)	15	3200.00	0.00
Activity time (min)	15	20.00	0.00
Heart beat at rest time (min)	15	64.87	4.74
Heart beat after activity (min)	15	141.60	15.02

RESULTS AND DISCUSSION

In this research, changes resulted from physical aerobic activities (jogging) carried out on cholesterol and triglyceride changes. Jogging was considered for all the subjects. The changes were not statistically meaningful.

Cholesterol has been recognized as a deleterious factor. Medical research finding indicate that there is a strong relationship between too much cholesterol in the blood or cholesterol serum and the possibility or heart coronary disease[5].

Given the fact that the observed triglyceride (2.56) was found to be smaller than the critical triglyceride (2.997), it can be concluded that an aerobic activity (a single-session, 20 min Jog) leads to no meaningful changes in the blood cholesterol rate. After activity the blood serum cholesterol rate of athletes had increased (3.74 %) in comparison with the blood serum cholesterol rate before activity (Table-3). Furthermore, observed triglyceride (0.95) was smaller than critical triglyceride (2.997), it can be concluded that an aerobic activity (in this research) leads to no meaningful changes in the triglyceride rate (Table-4). After activity their blood serum triglyceride rate had increased (3.44 %) in comparison with the blood serum.

The change which is created in the amount of blood cholesterol, after activity in comparison with before activity is not significant. *Vice-versa*, it indicates 3.74 % increase. Breifly, the reasons for increasing in cholesterol surfaces and triglyceride can be justified as follows: Physical activity cause to increase in cholesterol catabolism and the amount of cholesterol are entered in blood circulation for the use of active tissues. The mechanism of increase can be influenced by: a) the decrease of secretion of thyroid hormone due to physical activity, b) the increase of triglyceride due to the activity of lipase enzyme, c) Swift releasing of epinephrine and d) the decrease of acetyl co-A and other mediating materials of fatty metabolism also can be an incentive for transfusion of fatty to blood circulation. Considering that most researches which have been done, compare the

amount of cholesterol between athletes and non-athletes, or consider the effect of exercises for long time, most of these researches indicate the decrease of the amount of cholesterol. But in present research, the change in the amount of cholesterol, which was considered during 20 min exercising session, is similar to some of researches and contrary to the others.

TABLE-3
BLOOD CHOLESTEROL RATE (100 mg/mL) IN THE DAY OF EXPERIMENT

Variables	N	$\overline{X}$	SD	t.Obs	t.Cri
Blood cholesterol rate before activity	15	126.27	16.01	2.56	2.997
Blood cholesterol rate after activity	15	131.00	16.19	2.56	2.997

TABLE-4
BLOOD TRIGLYCERIDE RATE (100 mg/mL) BLOOD IN THE DAY OF EXPERIMENT

Variables	N	$\overline{X}$	SD	t.Obs	t.Cri
Blood triglyceride rate before activity	15	104.67	44.80	0.95	2.997
Blood triglyceride rate after activity	15	108.27	43.55	0.95	2.997

The changes in the amount of blood triglyceride after activity in comparison with before activity are not significant. This factor, totally, shows 3.44 % increase for all students. Seven out of the whole students of the research were involved in the increase of the amount of the triglyceride of blood serum when they were empty-stomached after activity. Probably this change refers to the increase of catabolism of netural fats, which were sloped in the blood circulation of active tissues of body. Also, the hormone of corticotrophin was influenced by the gland of anterior hypophysis. The decrease of Acetyl co-A and other mediating materials of fat metabolism can be stimulant for sending this agreggation of fats to the blood circulation.

The decreased amount of triglyceride in 5 students after activity indicates that some triglycerides were used for tissues of body. There were no changes in the amount of triglyceride of 3 students out of the whole students. Probably the reasons of that matter are follows: The stores of ATP-PC would be enough because of light trainings.

We can emphasize on another factor that is all the subjects had at least 3 years background in different field of sports. The cholesterol and triglyceride rate in fasting individuals was completely normal. Because of this reason measured factors was not statistically meaningful.

Another important point that caused researchers was the possible relationship between fatty or extra weight and the possibility of cardiovascular disease. In this study because of the non-facilities for measurement of the fat, the relative weight index which was the correlation between weight and height is applied.

On the other hand, none was the acceptable correlation between their relative weight and their triglyceride and cholesterol rate. The average correlation obtained between measured factors and their relative weight (Tables 5 and 6).

TABLE-5
COMPARISON OF TESTEE´S BLOOD SERUM CHOLESTEROL AMOUNT WITH RELATIVE WEIGHT BY USING PEARSON COEFFICIENT CORRELATION METHOD

Variables	N	$\overline{X}$	SD	Pearson coefficient correlation
Fasting cholesterol rate	15	126.27	16.10	0.403
Relative weight	15	22.07	1.46	-

TABLE-6
COMPARISON OF TESTEE´S BLOOD SERUM TRIGLYCERIDE AMOUNT WITH RELATIVE WEIGHT BY USING PEARSON COEFFICIENT CORRELATION METHOD

Variables	N	$\overline{X}$	SD	Pearson coefficient correlation
Fasting triglyceride rate	15	104.67	44.80	0.491
Relative weight	15	22.07	1.46	-

The final results of the study showed that a physical aerobic activity (20 min jogging) for the physical education students who had at least 3 years background in different field of sports could not decrease triglyceride and cholesterol rate of the students, but also increased their rate in 3.74 and 3.44 %, respectively.

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