Effects of 8-Week Endurance Exercise on Cholesterol & Triglycerides in Male Rates

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ABSTRACT

These decades study about immunology & hormone are developed by sport science researchers & also based on existence of meaningful interactions among immune systems & hormone & effects of activities, person influenced by hormonal & safety changes, so the researchers decided to study about interaction among their systems & changes & then physical activities which they are profitable & useful for athletes’ & people’s healthy

Method: Variables measured in the exercise and control groups were compared and then the descriptive and inferential statistics were used to analyse the hypothesis test. Natural distribution of data measured by the Kolmogorov Simonov test, and the statistical analysis of the data performed using the software SPSS version 16 by the ANOVA test through repeated measurements based on the normal distribution. To compare variables between the two groups of the t test was used. The significant level for all calculations was considered as p<0.05. Finding: Finding of showed the amount of “t” & meaningful level in dependent t-test cannot decline the zero hypothesis, so there is not meaningful effects of 8-week endurance exercise on plasma cholesterol in rates And the amount of “t” & meaningful level in dependent t-test cannot decline the zero hypothesis, so, 8-week endurance exercise don’t have meaningful effects on plasma triglyceride in male rates (P ≥0.05).

Discussion.

Other result of this research is about plasma triglycerides changes in male rates, but don’t report anything about it

Key words:

Introduction

These decades study about immunology & hormone are developed by sport science researchers & also based on existence of meaningful interactions among immune systems & hormone & effects of activities, person influenced by hormonal & safety changes, so the researchers decided to study about interaction among their systems & changes & then physical activities which they are profitable & useful for athletes’ & people’s healthy [21,18]

The skeletal muscle includes some of cytokines; interleukin 6,8,15 that they are called myokine. Hendschin&Spigman (2008) considered then as produced cytokine by muscle cells & they specify the relation between sport & inflammation [13,4] contraction activities have most important role in regulating cytokines in skeletal muscles. The goal of this research is studying on cholesterol & triglycerides in male rates in an endurance exercise. Maybe the time of endurance exercise be more than now &Ghanbari confirmed that; long-time exercise with 60 intensity to 0%80 vo2man specially, this exercise continue for several weeks, the energetic resources will be decreased [25].

Vodes et al resulted that there must be balance among energies (among receipt & cost of energy) to the weight, as a simplest indexes for destroying energy must fix in a time, otherwise, this equilibrium are not true, & caused to creating over or under weight. [2,1]. However, there are studies about plasma lipid (fat) changes on male rates, but there is not any study that it researched on all of these factors in an endurance exercise in male rates, so the most important question of this research is; does endurance exercise have effects on plasma lipids in male rates?
Plasma lipid:

All actions that circulation system do them must be considered as blood action & blood includes 8 percent of body weight. Blood consists of two parts; liquid part which means plasma & other is blood part, 55 percent of blood includes plasma & 45 percent of it relates to the blood cells which they are called hematocrit. 60 percents of plasma is water (much of water-soluble is found in plasma) [7], plasma is a fulvous liquid & consists of some of soluble & there are; solution gases such as; nitrogen, carbon dioxide & oxygen, ions such as; sodium, claire & calcium & also nutrients such as; glucose, amine acid, hormones, proteins. Some of different waste in blood plasma & also there is fat (liquid) in plasma which they are as ultrafine spherical particles in it. Fat molecules may join to the proteins attackers to fat in plasma & then moving with blood & plasma protein formed most volume of soluble. Three main groups of proteins are in plasma; albumins, fibrinogen, some of globulins, attacker molecules that joining to the hormones, ions & fatty acids & helped to the carrying them in circulation. The protein molecules are big & water soluble & the lipid molecules join to them, so they are carried by blood & also proteins carrier molecules prevent the destroying lipid molecules in liver [6,10,21]

kinds of lipid cores (fat) in blood:

The lipid cores are cholesterol & triglycerides that they join to protein in plasma & flow in blood (that named lipoproteins)

Main lipoprotein means; chylo-micron, HDL, VLDL, LDL, the highest kinds of it are triglycerides which they flow in blood about 70-150 g of it & 1-2 g of cholesterol come & go to plasma at night & day. Chylo-micron is the biggest lipid in lipoprotein that carry triglycerides from intestine by thoracic duct in to the venous system lipid & muscles tissue give about 90 percents of triglycerides of chylo-micron in capillary.[10]

Fatty acid & glycerol are obtained by hydrolysis of chylo-micron which caused to coming to the fat cells & muscles & used for energy or become storage & liver gives the remaining. VLDL, produced triglycerides carry them from internal of body from liver to the environmental areas such as muscles [16].

VLDL changes to the IDL after sometimes & after 2 hours changes to the LDL that its half-life is 2-3 days in blood, so the basic resources are LDL, VLDL which they consists 70 percents of LDL are picked up by liver. The little one of its which it is so important is picked up by macrophages that they go to the arterial walls & caused to creating platelets in arteriosclerosis [10].

Increasing the amount of cholesterol is because of increasing the product or fault clearing of VLDL or increasing the amount of conversion of VLDL to LDL. Increasing the VLDY production by liver is because of fat, diabetes, using alcohol, nephritic syndrome or because of genetics factors. Each situation which caused to the increasing LCD & cholesterol, often caused to the triglycerides level. Defect in picking up LDL could be genetics & sometimes nutritional issues caused to increasing fat. Increasing 25-40 mg of cholesterol higher than normal rate caused to vascular disease, high blood fats can be divided into the several groups [10,19].

Stephen Gland (2007) studied on molecular mechanism dominate on metabolic responses of skeletal muscle contraction of rates & human & IL-6 density in skeletal muscle contraction can be increased the serum level & influences on glucose metabolism, directly, as it is increased by glucose & determined in conversion of glucose to glycogen. IL-6 active the insulin in human skeletal muscle cells conversion of glucose to glycogen for preventing kinase phosphorylation 3, IL-6 doesn’t have effects on insulin in human skeletal muscle & increasing the glucose metabolism with tending to phosphorylation AMPK will be increased. Strengthen & increasing fatty acid oxidation IL-6 are decreased by ineffective isoforms AMPK-a in human muscle cells, using long-time IL-6 first myobute growth & differentiation strength & increased the involvement genes in muscle metabolism. The results showed that AMPK & IL-6 are the main & vital factors in regulation of effects contraction on skeletal metabolic responses also IL-6 can be participated in matching with skeletal muscles with sport [22].

AnjiHolmoz (2008) studied on hard increasing IL-6 by external IL-6 injection to rates & assumed that continuous increasing caused to preventing of glucose tolerance & insulin sensitivity while alternative increasing caused to they become better than before. Male Wister rates are improved by 14-times with human IL-6 (2.4 mg in each day) or saline with low osmotic properties (continuous IL-6) or by 2-times IL-6 injection in each day. The tests of glucose tolerance & insulin are done by after 14-times treatment & after 24hours the rates received insulin (150mg) or saline. Biopsying of liver & muscles about 10 minutes after insulin injection & IL-6 treatment increased the basic insulin sensitivity by evaluating measured insulin resistance homeostasis & strengthen the glucose in glucose tolerance. IL-6 increased fatty acids but didn’t increase triglycerides accumulation in skeletal muscles or in liver, while it increased PPAR Alpha protein & VCP in the skeletal muscle & showed that IL-6 can increase lipid oxidation by mitochondria & the result showed that without notice to the delivery situation, doing IL_6 increased glucose during 2-weeks. Holmes et al (2006) evaluated on the effects of adrenaline hormones on IL-6 & releasing it for creating whether IL_6 worked dependent in lipid (fatty) metabolism regulation or not, then they studied about the role IL-6 On
metabolic progress in people when they were resting or exercising (as they prevented analyzing fat situation), this increasing is seen in protein rotational IL-6 & amount of genes tissues by sport & more preventing the fatty acid. IL-6 discharge, effected on insulin significantly that reversed by IL-6 treatment in rates model & in the other model, weaken normal androgens IL-6 treatment & also glucose tolerance & against in a rate model, improved the treatment of chronic & acute.

Method:

As long as the subjects of the different groups of this research were rats, which were in a controlled environment and at a pre and post plan neatest, under the effects of independent variable (8-week exercise program), so there search method is experimental. In the present research, after the initial agreement, fourteen 3-month-old male Westar rats were obtained from the Pasteur Institute Centre of Amol.

After completion of training and 48 hours after cessation of exercise, and after 4 hours of fasting from food, the rats were anesthetized by intra peritoneal injection of a mixture of examine and analyzing. The liver tissue was cut off immediate Ely and placed in liquid nitrogen and then the tissue were homogenized with 17 mm phosphate offer and with a speed of 8000 rpm. The blood samples centrifuged immediately for 10 mina 1500 rpm. The plasma transferred in special micro tubes(3 samples of each)and became frozen in liquid nitrogen, and was maintained for subsequent measurement in the freezing of the temperature of -80° c. to avoid the evening effects, sampling began from 8 am and was completed 11:30 am. Variables measured in the exercise and control groups were compared and then the descriptive and inferential statistics were used to analyse the hypothesis test. Natural distribution of data measured by the Kolmogorov Simonov test, and the statistical analysis of the data performed using the software SPSS version 16 by the ANOVA test through repeated measurements based on the normal distribution. To compare variables between the two groups of the t test was used. The significant level for all calculations was considered as p <0.05.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t</th>
<th>Freedom rate</th>
<th>Meaningful level</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group</td>
<td>91.86</td>
<td>17.52</td>
<td>-0.053</td>
<td>12</td>
<td>0.959</td>
<td>Declined the zero hypothesis</td>
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<td></td>
<td>Exercise group</td>
<td>92.43</td>
<td>22.69</td>
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</tr>
</tbody>
</table>

Based on table (1) & the amount of “t” & meaningful level in dependent t-test cannot decline the zero hypothesis, so there is not meaningful effects of 8-week endurance exercise on plasma cholesterol in rates (P ≥0.05)

Results:

There is not meaningful among plasma cholesterol of trained & un-trained rates.
no significant difference among plasma triglycerides concentration in trained & untrained rates.

**Table 2**: dependent t-test for comparison among plasma triglyceride in trained & untrained rates

<table>
<thead>
<tr>
<th>Variable Group</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>T</th>
<th>Freedom rates</th>
<th>Meaningful level</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling group</td>
<td>82.71</td>
<td>17.37</td>
<td>0.314</td>
<td>12</td>
<td>0.759</td>
<td>Not declined the zero hypothesis</td>
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<tr>
<td>Exercising group</td>
<td>80.29</td>
<td>10.8</td>
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</tbody>
</table>

Based on table (2) & the amount of 'T' & meaningful level in dependent t-test cannot decline the zero hypothesis, so, 8-week endurance exercise don’t have meaningful effects on plasma triglyceride in male rates (P ≥0.05)

**Diagram. 2**: plasma triglyceride comparison (mg per deciliter) among trained & untrained rates

Zero hypotheses (H0): there is no significant difference among plasma triglyceride concentration in trained & untrained male rates.

As it seems the plasma triglyceride in trained rates are little more than untrained rates, so there is no significant difference among them.

**Discussion**:

Other result of this research is about plasma triglycerides changes in male rates, but don’t report anything about it. Stephen Gland (2007) studied on molecules mechanism dominated on metabolic responses of skeletal muscle concentration & the results showed that, strengthen the human muscle cells & increasing the lipid oxidation of interleukin-6 were decreased by nullify isoforms AMPK-a because AMPK & interleukin-6 are the main & vital factors in regulation of concentration effects on skeletal metabolic responses & interleukin- can participate in metabolism accurate regulation & matching skeletal muscle to sport [22].

Holmes *et al* (2000) studied on effects of adrenalin hormones on interleukin-6 & its releasing for creating it that whether interleukin-6 worked dependently in lipid metabolism regulation or not. The obtained results were, significant increasing in protein rotational interleukin-6 & genes tissue by doing more exercise, suppression of fatty acid that are because of kind & time of exercise [15].

Van Ovent *et al* (2009) trained animals for 7 days & reported lack of significant changes in lipoproteins, so, in recent research, cannot see then in lipid profile in 5 days exercising in each week & they are same as the results of their research.

Other reasons of lack of lipoprotein changes is food, in other hand, Persuli *et al* (1978) didn’t find meaningful esults 1 8-month exercise about lipid profile, so, may be during exercised considered as more cause for not existence lipoprotein changes, but it may enough for human to making meaningful
changes in LDL-C, HDL-C in 8-month exercise & other reasons of lack of lipoprotein changes were not changing in weight based on data of humans’ researches, weightless man strengthen the effects of exercising on lipoprotein [22].

References

human skeletal muscle during concentric contraction: evidence that IL-8, like IL-6, is influenced by glycogen availability. Am J Physiol Regul Integr Comp Physiol., 287(2): R322-7.


