



EFFECT OF ACUTE EXERCISE ON LIPID LEVELS OF WOMANⁱ

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Abstract:

In this study, the aim was to investigate the effect of acute exercise on blood lipids in females. Research group consists of females; 33,6 aged. From the beginning of the exercise to the end of acute swimming exercise, the participants gave blood samples in order to analysis the Cholesterol, LDL, HDL Cholesterol and Triglyceride levels. According to results, there was significant difference between pre and post tests in research group on Cholesterol, LDL, HDL Cholesterol and Triglyceride levels ($p<0,05$). Consequently, acute swimming exercises lead to significant alteration the level of Cholesterol, LDL, HDL Cholesterol and Triglyceride levels in females and it could say that acute exercises are useful application in terms of health.

Keywords: exercise, health, blood lipids

1. Introduction

Physical activity is the energy expenditure resulting from the movement of the body through the skeletal muscles. All kinds of physical activity require energy expenditure. Physical activity can be differentiated according to the characteristics of the studies (aerobic, anaerobic, etc.) (Zorba and Saygin, 2009, Özdal et al 2016) Exercise is a

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structured and planned community of movements designed to improve health and stay fit (Ardic, 2012). Exercise is a well-planned, structured, post-traumatic exercise that requires the expenditure of energy above the basal level as a result of contraction of skeletal muscles and voluntary, physical fitness is one of continuous physical movements aiming to develop one or more elements (Gursel, 2000). Aerobic exercise (AE) can be defined as a low-intensity, long-lasting, rhythmic, and dynamic activity in which large muscle groups are used. For example; hiking, cycling, jogging, aerobic dance, swimming and more. These activities are isotonic exercises against resistance or low resistance (Gursel, 2000).

However, it is also a serious study that exercising affects the body composition and fat structure by influencing to the endocrine system. Adipose tissue is the only tissue that can significantly increase mass after reaching adult size in the body (Hausman et al 2001). Blood lipids are transported to the body as they are dissolved in water and bind to specific proteins to form lipoproteins. Lipoproteins include protein, triglyceride, phospholipid, cholesterol, fatty acids, fat soluble vitamins and steroids. The lipoproteins present in the blood plasma are named according to their density. High fat content forms low density lipoproteins (LDL) while low lipid content forms high density lipoproteins (HDL) (Günay ve ark 2013, Cengiz et al 2013). Physical activity positively affects lipid metabolism and lipid profile (Özer, 2010). Regular physical activity leads to a reduction in body weight and fat deposits, while an increase in high HDL leads to a decrease in total cholesterol and low LDL levels (Kreisberg ve Reusch 2005, Umman ve Kaya 2001). Plasma lipid and lipoprotein profiles were found to be better than sedentary in active individuals have same sex and age group (Bouchard ve Despres 1995). Kaynar et al. (2016) determined the effect of short term intensive exercises on level of blood lipids in boxing athletes. They found total cholesterol, HDL-C and LDL-C levels were detected following short-term intensive exercise, but no significant difference was observed in TG levels after intensive exercise. Another study shows that short term intensive exercises affect blood profile of elite wrestlers. As a result of this study total cholesterol, HDL-C and LDL-C levels were increase after match, but no significant difference was observed in TG levels after intensive exercise (Kaynar et al 2015). The effects of exercise on lipid metabolism have been reported to increase lipid levels in many studies, although they depend on exercise type, duration, and intensity (Pronk, 2003). The purpose of the current study was to determine the effect of acute swimming exercises applied on the lipid profile in women.

2. Materials and methods

2.1 Participants and Exercise

Fifty sedentary women with an average age of 33.6 and no health problems participated in the study voluntarily. In this study, pre-test-posttest model was applied.

A 60-minute acute exercise program was applied to the study group, including a 10-minute warm-up, 40-minute free-style swimming, and 10-minute cooling exercises.

2.2 Evaluation of Blood Samples

Plasma samples were separated by centrifugation at 3000 rpm at 10 minutes. The desired parameters were measured in the laboratory from the plasmas. The analysis of Triglyceride, Total Cholesterol, LDL and HDL Cholesterol were done through the Enzymatic Colometric method by using the BT3000 biochemistry auto analyzer.

2.3 Statistical Analysis

In the analysis of the obtained data, SPSS 22.0 package program was used. The Paired samples t test was used to determine the differences between the pre-test and post-test values of the study group.

3. Results

Table 1: Lipid Profile of Research Group

Parameters	Tests	Mean	Std.Er.	t	p
Triglyceride(mg/dL)	Pre test	118,86	9,33	3,27	0,002
	Post test	101,18	6,50		
Total Cholesterol (mg/dL)	Pre test	164,40	6,34	4,44	0,000
	Post test	180,54	6,88		
LDL Cholesterol (mg/dL)	Pre test	100,38	5,29	3,49	0,001
	Post test	112,70	5,47		
LDL Cholesterol (mg/dL)	Pre test	47,68	1,65	6,95	0,000
	Post test	53,54	2,11		

Total cholesterol, LDL, HDL cholesterol and triglyceride values of the study group were given in Table 1. There was significant difference between before and after exercise in triglyceride values of research group ($p < 0.05$). Total cholesterol, LDL and HDL cholesterol of pre-test and post-test values were increased significantly.

4. Discussion

Acute swimming exercises lead to meaningful differences in blood lipid levels in sedentary women. Exercise and physical activity on the lipid profile, which has an important role for the cardiovascular system, are the most valuable of treatment options. The positive effects of regular and long-term, moderate aerobic exercises on blood lipid levels have been demonstrated in some studies (Kocuyigit et al 2011, Lemura 2000). The effect of exercise on lipid profile is known to lead to changes in the lipid profile in general, depending on the duration, severity and extent of exercise. In a study which investigation of acute effects, it has been shown that athletes have an increase in total cholesterol, HDL cholesterol and LDL cholesterol levels in order to meet the increased energy need as short-term intensive exhaustive metabolic response (Kaynar et al 2016). Also, the elite level wrestlers who were subjected to the intensive training program had high levels of HDL, LDL and total cholesterol after competition were reported in another study that showed a significant increase in pre-exercise levels (Kaynar et al 2015). The results of this research showed similarities with the results of acute swimming exercises results.

When the effects of long-term aerobic exercises on lipid metabolism are examined, Aydoğan (2013) applied a six-week exercise program on sedentary housewives. Despite the increase in total, HDL cholesterol and triglyceride values and decrease in LDL cholesterol values as a result of this study, these changes were not significant statistically. Another study showed that short-term aerobic and combined exercises produced changes in total cholesterol and triglyceride levels (Arslan et al 2017). In another study, it was determined that different circuit training lead to significant changes in lipid profile in overweight adults and it has been reported that especially aerobic circuit exercises lead to a decrease in the level of LDL cholesterol (Contro et al 2017). In another study's results showed that the subjects in the gardening intervention as a low- to moderate-physical activity had a significant improvement in their high-density lipoprotein (HDL) in women (Park et al 2017). In a similar study Racil et al (2013) high density moderate exercises Low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, levels were positively altered. The other study result showed that 16-week line-dancing exercise group showed a significant decrease in body weight, percent body fat, body mass index, total cholesterol, triglycerides, low-density lipoprotein cholesterol (Lee et al 2017).

As a result, it has been shown that acute swimming exercises cause significant changes in lipid profiles. For health reasons and lipid metabolism, acute swimming and other exercises may be an effective method, but it could said that longer duration of exercises may contribute to a significant increase in health.

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