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The Comparison of Some Blood Lipids Levels Before and after Handball Match in Players

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Abstract: This study was conducted in order to determine the effect of competitions played in one legged league on lipid levels in elite male handball players.12 elite male handball players with a mean of age 22.16±1.85 years, high 181.16±5.18 cm and body weight 81.59±11.99 kg were participated in the study. Blood lipid levels were measured of the subjects after being informed about the tests before (BM) and after the games (AM). Blood samples were taken in the laboratory. The blood samples taken from the subjects'antecubital fore-arms in hygienic conditions before and after the handball games were put in tubes containing 5 ml EDTA and the blood lipid levels were analyzed using auto-analyzer in Central Laboratory. To determine the differences between linked groups, paired student t test was performed. SPSS 13.0 packet programmer was used to assess the data. $P<0.05$ was considered significant. Changes in the levels of body weight, body mass index and body fat percentage were significant while they were found to be insignificant in blood lipid levels before and after the games ($p>0.05$) at the end of the study. In conclusion, this result shows that the exercises applied acutely under competitive conditions have no effect on blood lipid levels.

Key words: Handball · Competition · Blood lipids

INTRODUCTION

Human body is a great asset with special talents when examining closely. This great asset needs movements continuously due to presence of the congenital talents. Developing technology in this century we are living now provides great convenience and comfort. But, as a result of the conveniences of developing technology human suffers from the disease of sedentary life and human physiological features are being affected by the sedentary life. The physical and physiological characteristics were adversely affected as well as a result of a sedentary life of people especially for middle-aged and older [1-3]. Positive effects of applied long regular exercises on physical, physiological, psychological and motoric features have been reported [4] and one of the most important positive effects of regular exercise is on blood biochemistry. The effect of regular exercises on the blood cells, lipids and electrolyte levels were found when blood biochemistry was examined [5]. Regular and well-tuned intensity aerobic exercise reduces to total cholesterol, LDL cholesterol, triglycerides, blood lipid levels, while increases HDL cholesterol levels were estimated [6]. It was reported that regular exercise has important roles for prevention of health problems as well [7]. Considered diseases of the age are especially obesity and cardiovascular diseases as well as muscular weakness, disturbances in physical appearance, diabetes and many others seen more frequently in individuals with sedentary life [8]. Sedentary lives adversely affect the body composition and blood lipid profile, whereas regular exercise reduces levels of LDL cholesterol and increases HDL cholesterol level [9]. Exercise intensity, duration and frequency have to be determined carefully to be able to have positive changes in blood biochemistry [10].

It has been detected that regularly performed aerobic and anaerobic exercise make a positive impact on the level of blood lipids in some studies [11,12], although there are some studies have shown that no significant connected changes in blood lipid levels with the severity principles [13].

This study was done in order to determine the effect of applied single-circuit competition on some lipid levels in elite male handball players.

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MATERIAL AND METHODS

12 male handball players playing in the second league joined the study voluntarily. The subjects played handball held for five days in 1. League Interuniversities Group Competition. The measurements were done after informing the subjects about tests before (BM) and after matches (AM). Physical measurements such as age, height, body weight, body mass index (BMI) and body fat percentage (BFP) as well as blood lipid levels such as triglycerides, cholesterol HDL and LDL cholesterol were measured. Ages of the subjects determined based on credentials. Height of the subject determined with using measuring instrument, its trade mark is Rodi Super Quality, as cm and body weight were measured with using an electronic scale as kg. Body mass index was calculated by formula of body weight (kg) / height (m^2). Body fat percentage was calculated from taken from parts of biceps, triceps, subskapula, subrailiak, abdominal and thigh by skinfold caliper using the Green formula (BFP = 3.64 + 0.097 x total skinfold). The subjects were warned about not to take drink and any food after 22:00 pm before the measurements and the blood samples were taken in the next day morning between at 9:00 to 10:00 am in the laboratory. Taken blood from antecubital forearm of the subjects before and after handball matches lasted 5 days according to the hygiene rules put in tubes contain 5 ml EDTA and the blood lipid levels such as triglycerides, cholesterol HDL and LDL cholesterol were analyzed using auto-analyzer (architect) in Central Laboratory of Erciyes University.

Measurement results were presented as the mean and standard deviation ($\bar{x}$ ± SS). To determine the differences between linked groups student t (paired Student t) test was performed. SPSS (Statistical Package for the Social Sciences) 13.0 packet programmer was used to assess the data. P <0.05 was considered significant.

RESULTS AND DISCUSSION

In the study was done in order to determine the effect of applied single-circuit competition on lipid levels in elite male handball players, ascending or descending in the variables of blood lipid levels were found. However, these changes were statistically insignificant. Blood lipid levels related other studies and findings revealed similarities and differences with ours.

Table 1: Physical Characteristics of Handball players before and after the matches

Variables	BM/ AM	N	X± Sd	t	p
Age (year)	BM	12	22,16±1,85	-	-
	AM	12	22,16±1,85		
Height (cm)	BM	12	181,16±5,18	-	-
	AM	12	181,16±5,18		
Body Weight (kg)	BM	12	81,59±11,99	3,124	,010*
	AM	12	81,16±12,14		
BMİ (kg/(m)^2)	BM	12	24,81±3,07	3,165	,009**
	AM	12	24,67±3,09		
Body Fat Percentage (%)	BM	12	12,08±2,99	-2,895	,015*
	AM	12	11,592,49		

*p<0.05 **p<0.01,

When the showing tables and graphs to physical characteristics of the subjects examined, it is seen that the differences in body weight, body mass index and body fat percentage were significant (p <0.05).

Table 2: The Blood lipid levels of Handball players before and after the matches

Variables	BM/AM	N	X±SS	t	p
Triglyceride (mg/dL)	BM	12	98,66±70,65	,237	,817
	AM	12	93,25±36,48		
Cholesterol (mg/dL)	BM	12	167,00±27,35	-,161	,875
	AM	12	168,83±35,11		
LDL- Cholesterol (mg/dL)	BM	12	102,16±23,47	,272	,791
	AM	12	99,75±27,19		
HDL - Cholesterol (mg/dL)	BM	12	45,58±7,68	-1,023	,328
	AM	12	49,33±10,72		

*p<0.05 **p<0.01,

When the table shows the blood lipid levels of the subjects were examined, no significant changes found in triglyceride, cholesterol and LDL and HDL cholesterol levels (p >0.05).

Exercise-induced decline in cholesterol, triglycerides and LDL cholesterol levels and exercise-induced increase in HDL cholesterol levels were found similar in the study done by using male university students with a mean age of 21,2±1,7 [14]. In another study, significant decrease in triglyceride levels were found as a result of eight-week resistance training in male college students with a mean age of 22.8 ± 2 year [15]. It has been emphasized that increases in HDL cholesterol was significant, while LDL cholesterol level was not statistically significant as a result of ongoing 8 weeks of endurance training [16]. An increase in HDL cholesterol levels was determined in the study done on the sedentary females between the ages of 18-22 after continuing seven weeks steps training programme [17]. Aerobic training program applied to 44 overweighed subjects with high blood pressure for nine weeks and at the end of the program, 25 mg / dl and 18 mg / dL reduction in total cholesterol and LDL cholesterol levels were determined, respectively [18]. Statistically significant increase in HDL cholesterol and reduction in LDL cholesterol levels determined after applying aerobic and anaerobic training for eight-week in the study done by Koç and Tamer [19]. It was determine that applied aerobic exercise caused to significant decrease in triglyceride levels and significant increases in HDL cholesterol levels in the study of which aim was to determine effects of different types of exercise on lipid-lipoprotein profile of subjects [20].

While reduction in the LDL cholesterol and increase in HDL cholesterol were determined in the end of the study done in order to determine effects of long-lasting physical activity on serum lipids [21], increase in HDL cholesterol and reduction in LDL cholesterol were detected by Mansfield and his colleagues [22]. Gang and his colleagues examined the relation between physical activity levels and serum lipids using the male and female subjects between the age of 20-49 years in their study and as a results reduction in serum triglyceride, total cholesterol and LDL cholesterol levels found in male subjects making walking and cycling exercises [23]. 1.8 ± 8.3 mg / dL increases in HDL cholesterol levels found in middle-aged women after application of walking program for 12 weeks [24]. In another study it was determined that applied intense exercise caused the decrease in LDL cholesterol and increase in HDL cholesterol [25]. Leon and his colleagues examined the effect of 20-week lasting bicycle ergo meter on plasma lipid using the male and female subjects between the age of 17-65 years in their study and in the end reduction in total cholesterol and triglyceride levels and increase in HDL cholesterol level were found [26].A decrease in LDL cholesterol by long-lasting aerobic exercise have been noted [27].

In the end of the study with the aim of investigating the effects of aerobic exercise on blood lipids, it was reported that the exercise has no effect on triglyceride and cholesterol parameters, but caused the increased in HDL cholesterol level and reduction in LDL cholesterol level [28]. Haigh and his colleagues studied the serum lipid levels in runners and found no significant changes in total cholesterol and LDL-cholesterol levels compare to the control group, while a significant decrease in triglyceride levels were detected [29]. Garner and his colleagues found the changes in triglycerides and LDL cholesterol levels statistically insignificant, while significant increase in HDL cholesterol level in their study [30]. Kükçü and his colleagues found no differences between the control group and young wrestlers in terms of total cholesterol, triglyceride and LDL cholesterol levels, whereas significant difference in HDL cholesterol in their study [31]. It was determined that applied high and low intensity exercise made no changes in cholesterol and LDL cholesterol levels by the done study to determine the effects of different intensity of exercise on blood lipid levels [32]. 30-60 minutes exercise program applied to sedentary young women with the severity of 60% of their maximal oxygen consumption and exercise-induced changes in normal lipid profiles were not specified after the exercise program [33].

When the literature was examined, exercise-induced decrease in cholesterol, triglycerides and LDL cholesterol levels seen less often than increase in HDL cholesterol levels in the former studies. These results can be consequences of accelerated entering of LDL into cells with the help of increasing LDL receptor activity during the training. Our findings of the variables like triglycerides, cholesterol, LDL and HDL cholesterol contain similarities with the results of former studies.

CONCLUSION

As a result, although the matches results in ascending or descending the levels of variables of the subjects, the found changes were within the normal range. This results shows that applied acute conditions of matches have no effect on blood lipid levels.

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