Güreşçiler ve Futbolcuların Lipid ve Lipoprotein değerlerinin karşılaştırılması

Compare of Lipid and Lipoprotein Values of Wrestlers and Soccer Players

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INTRODUCTION: The aim of this study was to compare of lipid and lipoprotein values of wrestlers and soccer players.
METHODS: Total of 35 subjects, 17 male wrestlers who do sports for 11.5 years, 18 male soccer player students who sports average 11.9 years, participated in this study. Triglyceride (TG), Total Cholesterol (TC), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C) levels were determined by Hitachi 717 autoanalyser. To determine the differences between wrestler and soccer players "independent t" test were performed.
RESULTS: There is a significant difference in body weight and body mass index between wrestlers and soccer players ($p<0.05$). Moreover, significant differences in plasma TC, LDL-C, and HDL-C values between wrestlers and soccer players ($p<0.05$, $p<0.001$). However, no significant differences in plasma TG values between wrestlers and soccer players ($p>.05$).TC and LDL-C values of wrestlers were significantly higher than the soccer players ($p<0.05$). HDL-C values of soccer players were significantly high from wrestlers ($p<0.05$). It is meaningful that the ratio TC / HDL-C of wrestlers is higher than soccer players ($p<0.05$).
DISCUSSION AND CONCLUSION: Total cholesterol, triglyceride, high and low-density lipoprotein cholesterol of soccer players were found better than wrestlers. This situation can be caused by branches and training differences. This result shows that between wrestlers and soccer players did differences in lipid and lipoprotein levels. Lipid and lipoprotein values of wrestlers and soccer players have shown that they do not carry the risk of cardiovascular disease. In addition, it is recommended that the wrestlers should have jogging or aerobic training in their daily regular training.

Keywords: Wrestler, Soccer Players, Exercise and Blood

INTRODUCTION

Physically inactive lifestyle and low levels of cardio respiratory fitness lead to an increase in the risk of developing numerous chronical diseases as well as all-cause mortality[1]. In the middle-aged and older periods health problems occur more commonly such as high blood pressure, obesity, muscular weakness, postural disorders, diabetes, and risk factors for coronary artery. Studies have shown that increasing risk factors in coronary heart diseases are high cholesterol, triglycerides, LDL-C (low-density lipoprotein cholesterol) levels and low HDL –C (high-density lipoprotein cholesterol) levels in blood lipids[2]. Both aerobic and anaerobic exercises can decrease total cholesterol (TC), raise high-density lipoprotein cholesterol levels, and lower the

TC/HDL-C ratio. The effect of exercise on low-density lipoprotein cholesterol generally has been inconsistent and is regarded to be minor in magnitude. Among elite athletes, exercise continues to promote favourable lipoprotein profiles. Elevation in body mass index (BMI) has been associated with less favourable lipoprotein profiles; with an increased relative risk of CHD (coronary heart disease), as well as an increased mortality due to cardiovascular diseases[3]. Studies support a significant incremental effect of exercise on blood lipids and lipoproteins in men. It has been reported that the changes in HDL-C levels with exercise training were inversely related to baseline HDL-C levels. These findings suggested that individuals with the lowest HDL-C levels would exhibit the greatest increases in HDL-C with exercise[4]. The effects of physical activity on lipid and lipoprotein metabolism; TC (Total Cholesterol), LDL-C, TG and TC/HDL-C ratio significantly decreased after exercises. Therefore in order to become fit and to keep healthy organism, activities such as fitness, aerobics, jogging, etc. are important[5]. There is substantial, consistent and strong evidence that physical activity is a deterrent for developing many forms of cardiovascular disease (CVD). Many researches have shown that the cholesterol is related with CHD. LDL-/HDL-C ratio can show increased rate of arteriosclerosis disease. Low blood levels of HDL-C are an independent risk factor for CVD[6,7]. Positive effects of applied long regular exercises on physical, physiological, psychological and motoric features have been reported and one of the most important positive effects of regular exercise is on blood biochemistry. Regular and well-tuned intensity aerobic exercise reduces total cholesterol, LDL cholesterol, triglycerides, blood lipid levels, while increases HDL cholesterol levels when estimated[8]. Wrestling and football are a very vigorous physical activity in sport. They also pointed out that hypercholesterolemia and low levels of HDL-C were more pronounced in power sports (i.e., weight lifting, boxing, wrestling and judo) and anaerobic sports (i.e., tennis, sprints, and jumps, gymnastics, ice skating)[9,10]. Physical activity has a beneficial effect on the serum lipid profile. The recognition of the cardiovascular risk in a sedentary lifestyle and of the benefits of regular exercise have led to the promotion of sport as a means to improve health and prevent certain diseases. However, the response of the lipid profile to an exercise session or training program is different depending on the type of exercise undertaken, its intensity and frequency, the duration of each session, and the time spent in such a program[11]. A large number of epidemiological studies revealed a relationship between dyslipidaemia and the prevalence of atherosclerosis and coronary heart disease. Increased physical

activity is associated with a reduction in the risk of cardiovascular disease, but there is conflicting information about the optimal intensity and the amount of exercise necessary for this reduction[12]. Epidemiological studies suggest that individually measured and programmed physical activity, and the implementation of primarily aerobic physical activity, leading to increased concentrations of HDL cholesterol and lowering the value triglyceride, total and LDL cholesterol. When the intensity of the workout well controlled, the power consumption is a major factor affecting lipids and lipoproteins. Training leads to a series of adaptation, morphological and functional changes at the level of the cardiovascular system, neuromuscular system, as well as lipid athletes. Recent studies have shown that the dosed individually and programmed physical activity leads to increase the concentration of HDL cholesterol, and decreasing triglyceride, total and LDL cholesterol[13].

In this study, it is aimed to compare lipid and lipoprotein values of wrestlers and soccer players, moreover, to investigate cardiovascular disease risks. It is thought that there is a difference between lipid and lipoprotein values of soccer players and wrestlers because they have differences in terms of branches and training. Soccer players do aerobic training in their regular training more than wrestlers. This study is important in terms of comparing lipid and lipoprotein values of wrestlers and soccer players.

MATERIALS AND METHODS

Subjects: 17 male wrestlers who do sports for 11.5 years, 18 male soccer players, who do sports at least 11.9 years group, total 35 subjects participated in this study. Wrestlers were university students and national athletes. Soccer players were college students playing in different leagues. Written consent was obtained from all the participants, who volunteered to participate in the present study.

Lipid and Lipoprotein Measurement: Blood samples were obtained from the antecubital vein of the subjects 48 h before exercise sessions. Fasting blood samples were taken in the morning. The samples were analysed for triglyceride (TG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL). TG, TC, HDL-C, LDL-C levels were determined by Hitachi 717 Auto analyser. Blood samples were taken within the scope of the ethic committee report of Ondokuz Mayıs University (Report No: B.30.2.ODM.O.20.08 / 255).

Body mass index (BMI) = Body Weight (kg) / Height $(m)^2$ = (kg/m^2)

Analysis of Data:

Analysis was performed on SPSS 22 version. Kolmogorov-Smirnov test was used to evaluate the normality of parameters. Comparison of age and height were used in this study and, to determine the differences between groups "independent t" tests were performed. Statistical significances was accepted at $p<0.05$.

RESULTS

Physical anthropometric and motoric characteristics for wrestlers and soccer players were given in Table 1. Comparison of serum lipid values were given in Table 2. Table 3 shows the cardiovascular risk status of the participants.

Table 1: Physical Characteristics of Wrestlers and Soccer players

Parameters	Wrestlers	Soccer player	t
Age (year)	23.72±1.87	24.10±1.75	0.07
Body Height (cm)	174.43±6.72	174.16±6.81	0.10
Body Weight (kg)	75.80±11.3	69.49±9.6	2.96*
BMI (kg/m^2)	25.04 ±3.64	22.95±3.62	2.88 *
Age of training (year)	11.5±5.4	11.9±5.5	0.29

*p<0.05

Table 2: Comparison of Serum Lipid Values of Wrestlers and Soccer players

Mg/100cc	Groups	Mean	sd	t
TC	Wrestlers	177.69	12.34	3.67**
	Soccer players	163.34	12.60	
TG	Wrestlers	96.65	14.95	0.92
	Soccer players	94.25	12.14	
HDL-C	Wrestlers	54.72	3.82	2.16*
	Soccer players	57.45	3.39	
LDL-C	Wrestlers	132.63	15.43	2.68*
	Soccer players	119.47	15.33	

*p<0.05, **p<0.001 sd: standart deviation

Table 3: Risk of Cardiovascular Diseases of Wrestler and Soccer players

Mg/100cc	Groups	Mean	sd	t
TC/HDL-C	Wrestlers	3.25	0.34	2.28*
	Soccer players	2.84	0.35	
LDL-C/HDL-C	Wrestlers	2.42	0.27	1.16
	Soccer players	2.08	0.30	

*p<0.05 sd: standart deviation

DISCUSSION

Previous epidemiologic studies have demonstrated an increased risk of CHD and cardiovascular death with an increase in BMI[3]. Stevens et al. (1998) found that among healthy men, increasing BMI was associated with an increased relative risk of cardiovascular death, particularly among younger subjects[14]. The Canadian Heart Health Surveys Research Group reported an increased prevalence of dyslipidaemia associated with an elevated BMI, a positive association between BMI and TC, LDL-C, and triglyceride levels, and an inverse relationship to HDLC levels[15]. In a study, Joseph et al. (2001) found comparing mean lipid values among BMI categories demonstrated lower high-density lipoprotein cholesterol levels ($p<0.01$), higher triglycerides ($p<0.05$), and higher total cholesterol/high-density lipoprotein cholesterol ratios ($p<0.001$) with an increasing BMI in soccer players[16]. In this study, BMI for wrestlers are higher than soccer player. BMI is 25.14kg/m^2 for wrestlers and 22.95kg/m^2 for soccer player. There is a significant difference in body weight and body mass index between wrestlers and soccer player ($p<0.05$). There was no significant difference between age, body height, and age of training ($p>0.05$). Majority of the studies showed that decreased triglycerides, cholesterol and LDL cholesterol levels, and increased HDL was the result of applied training when severity of exercise, duration and frequency were approved[17]. In a study with football training, found decrease in LDL, cholesterol and LDH levels and a statistically significant result was found[18]. Most important effect of exercise on human body is on metabolic system specially lipids. Lipid and lipoprotein are risk factors for coronary heart disease[13]. Most cross-sectional studies indicate smaller, non-significant differences in TC and LDL-C levels between exercise-trained and sedentary individuals[19, 20]. Aydoğan (2017) in a study, found TG and HDL-C levels were not to be different between wrestling groups[17]. İmamoğlu et al (2005) in a study, stated that there

found no significant differences in plasma TC and TG values between the groups of wrestlers and students. No significant differences were found in HDL-C and LDL-C values between wrestlers and male students[4]. In This study, there were significant differences in plasma TC, LDL-C, and HDL-C values between wrestlers and soccer player ($p<0.05$, $p<0.001$). There were no significant differences in plasma TG values between wrestlers and soccer player ($p>.05$). TC and LDL-C values of wrestlers were significantly high from soccer player ($p<0.05$). HDL-C values of soccer player were significantly high from wrestlers ($p<0.05$).

Koc (2011) in a study, found significant reductions in the exercise-induced triglyceride, cholesterol, and LDL cholesterol and increase in HDL levels[8]. Labovic et al. (2015) in a study, the results that athletes have lower total cholesterol, LDL cholesterol and triglyceride levels, and higher serum HDL from people[13]. Friedmann and Kindermann (1987), found HDL-C levels higher in endurance training male group than inactive group. A lot of studies support that aerobic exercises increase the HDL-C levels[20]. Exercise is a potential factor that may modify lipid profile and therefore reduce the risk for CHD[21]. İmamoğlu et al., (2005) in a studies, were not found on HDL-C to be significantly different between the groups. Because male wrestlers perform mostly nonaerobic exercises and strength training, the exercises like these did not increase the HDL-C levels[4]. In the end of the study which aimed to investigate the effects of aerobic exercise on blood lipids, it was reported that the exercise has no effect on triglyceride and cholesterol parameters, but caused an increase in HDL cholesterol level and reduction in LDL cholesterol level[22]. Including some research reports a lower HDL-C in power-anaerobic athletes[4,23]. When literature was reviewed about effects of exercise on plasma lipids, lipoproteins, results indicated that moderate and low intensity exercises are of great importance. These events show increase of HDL-C, Decrease of LDL-C and increase protective effects to arteriosclerosis[4]. It has been identified that regular aerobic exercises reduces total blood cholesterol, serum triglycerides and LDL-C and increases high-density lipoprotein cholesterol HDL-C[24, 25]. In a study, examine the effect of 6 weeks of wrestling and wrestling–technique based circuit exercise on the plasma lipoprotein profile, it was shown that cholesterol and HDL decreased significantly[23]. In this study; soccer players were found to have better HDL-C levels than wrestlers. This Status can be the result of intensive training and nutrition. It is suggested that wrestlers should do more running and aerobic training.

The people who have HDL-C cholesterol levels under 40 mg/100cc have more than three times of risk of cardiovascular diseases than people who have high HDL-C levels[19]. The periodic risk of heart disease can estimate by dividing TC to HDL-C. As a result of the estimation 4.5-5 levels show important cardiovascular disease risk, 3.8-4 levels show low cardiovascular disease risk[26]. In another, the risk factor is high if TC/HDL-C ratio is higher than 5; the risk factor is low if the ratio is lower than 3.5[25]. İmamoğlu et al (2005) in a study, mentioned that lipid and lipoprotein values of the four groups have indicated that the individuals in exercise groups would not be exposed to danger of cardiovascular diseases. The cardiovascular risk ratio of wrestlers are higher than other groups. Athletes engaging in aerobic sports at a high level particularly favoured with respect to their low overall risk of coronary heart disease and, in particular, to their highly favourable plasma lipoprotein pattern[27]. High-intensity aerobic training results in improvement in high-density lipoprotein cholesterol[2,28]. Studies of large populations of men have shown that persons who exercise at a moderate or strenuous level have a lower incidence of CHD. The effect of exercise has been shown in controlled studies to raise HDL-C levels, lower TG, and lower the TC/HDL-C ratio[3]. A training program that emphasizes strength, power, speed ability, resistance, explosive, and interval sprint can result in undesirable health and fitness consequences for the participants in power-anaerobic based sports[23]. Garry and McShane (2001) in a study, demonstrated that the strongest relationship between BMI and lipoprotein levels occurred between BMI and the TC/HDL-C ratio[3]. Wrestling is categorized as a power-anaerobic based sport on the basis of its nature of practice, competition times[23]. In this study, found the cardiovascular risk ratios (TC/HDL-C) to be 3.25 mg/100cc for wrestlers and 2.84 mg/100cc for soccer player. LDL-C/HDL-C ratios found 2.42 mg/100cc for wrestlers and 2.08 mg/100cc for soccer player. In this study, is meaningful that the ratio TC / HDL-C of wrestlers is higher than soccer player ($p<0.05$). There was no significant difference in LDL-C / HDL-C ratio between wrestlers and soccer player ($p>0.05$). TC/HDL-C and LDL-C / HDL-C ratio for wrestlers is higher from soccer player. This can be attributed to the fact that the training form of the Wrestlers is mostly anaerobic from the soccer player. Wrestlers and soccer player with the highest BMIs and elevated TC/HDL-C ratio may be those at greatest risk for future CVD, regardless of TC or LDL-C values.

CONCLUSION

Total cholesterol, triglyceride, high and low-density lipoprotein cholesterol of soccer players were found better than wrestlers. This situation can be caused by branches and training differences. This result shows that between wrestlers and soccer players did differences in lipid and lipoprotein levels. Lipid and lipoprotein values of wrestlers and soccer players have shown that they do not carry the risk of cardiovascular disease. In addition, it is recommended that the wrestlers should have jogging or aerobic training in their daily regular training.

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