International Journal of Sport Culture and Science
June 2019 : 7(2)
ISSN : 2148-1148
Doi : 10.14486/ IntJSCS.2019254974

Effect of Aerobic Exercise on Some Blood Parameters on Sedentary Individuals

Zeynep YILDIRIM, **Emre ÇİLİNGİR**
Bartın University, Sport Sicence Faculty, TURKEY
Email: zeynep.erol1989@gmail.com

Type: *Research Article (**Received:** 22.07.2019 – **Corrected:** ---- – **Accepted:** 24.09.2019)*

Abstract

The aim of the study was to investigate the effect of aerobic exercise on some blood parameters in sedentary individuals during 8 weeks. In this study, 9 Volunteer male sedentary individuals with an average age of 27.11±1.83 were involved. The subjects who participated in the study were given a 75-minute walking exercise 3 days a week, along with average ground exercises per day. Blood measurements and height-weight measurements; Each of the subjects was performed twice before and after the exercise program, including before the training program (pre–test) and after the training program (final–test). Food intake was stopped 12 hours before the measurements. The data was evaluated statistically using the IBM SPSS Statistics 23 License Authorization Wizard package program according to the values obtained from the measurements. P > 0.05 was considered statistically meaningless. When the statistical results are examined; while Weight, Total Cholesterol, TRIG, HDL, LDL, AST, ALT, Iron, Total Iron Capacity levels (TRIG, HDL, Iron and Total Iron Capacity) levels of sedentary individuals were not found to be statistically significant., (Weight, LDL, AST and ALT) levels were found statistically significant difference (p <0.05).

Keywords: sedentary, aerobic exercise, blood, total cholesterol, triglycerides, HDL, LDL, AST, ALT, total iron

Introduction

Physical activity, sports and vital activities, including muscle and joint movements are all body movements. Exercise is defined by the American Institute of Sports Medicine (ACSM) as the maintenance of physical health, repeated, planned and structured sportive activities of the body, depending on the deterioration of internal balance. (Kılıç Toprak, 2015). Exercise; It's a subtitle of physical activity, which is the body movements that are continually maintained without a break, so that they can maintain physical fitness or healthy life. ((Lindwall, 2004) While physical activity can be done without plan, exercise can be considered as previously planned activities. Sedantary's life-related disease risks are rising throughout life, beginning in childhood. (Booth ve Hargreaves, 2011). Today, inactivity is considered a discomfort with many fatal diseases. Cardiovascular systems and obesity are the most important of these. In addition, high cholesterol, triglyceride signs, abnormalities of blood sugar, susceptibility to high blood pressure, digestive and excretion problems, low breathing capacity, posture disorder, loss of flexibility of the chest cage, post-partum abdominal sagging, weak abdominal and back muscles , loss of strength and flexibility in muscle structures, calcification of skeletal structure, joint restriction, weak organism, easy illness and recovery problems are described as the discomforts of our time. (Göksu ve ark., 2003).

Type of exercise may vary according to intensity and duration of hematological and biochemical variables. (Demiriz ve ark., 2015). The effect of exercise on biochemical variables has become a continuous research topic. There has been a significant increase in exercise in recent years due to the positive effect of exercise on fats and carbohydrate metabolism, positive decreases in body weight, fat stores, total cholesterol and triglycerides (Tran and Weltmen, 1985) and the prevention of many diseases. (DeSouza ve ark., 2000). Exercise has many goals such as controlling oxygen distribution, regulating metabolic processes, increasing strength, improving endurance, reducing body fat, and regulating muscle-joint activity. (Aktürk, 2017). Exercise individuals are expected to have some physiological differences, along with acute and chronic adaptation. It is reported that regular, long-term and moderate aerobic exercises cause decrease in total cholesterol, LDL, triglyceride risk factors which are among the risk factors of coronary artery and cause an increase in HDL level. In addition, it is emphasized that high blood pressure and obesity diseases decrease with exercise. There is a stronger connection between plasma cholesterol levels and the risk of cardiovascular disorder, regardless of other risk factors. High LDL cholesterol levels have been shown to cause atherosclerotic heart disease. (Karacan ve Çolakoğlu, 2003). In recent years, the main reason for increasing the trend of exercise in the developed world has been found to be to maintain body health. In many studies, it is determined that regular exercise has a positive effect on people's body in sociological, psychological, motoric and physiological terms. (Gültekin, 2018). The aim of this study was to investigate the effect of 8 weeks of exercise program on 9 blood sedentary individuals on some blood parameters. The effects of aerobic exercise training program on blood lipids were examined.

Methods

In this research; the average age is 27.11 ± 1.83, living in the district of Samsun 19 May; 9 male sedentary individuals participated voluntarily. Participants were given an average of 60 minutes of walking exercise per day, 3 days a week. Blood measurements and height-weight measurements; Each of the subjects was given two times before and after the training program (pre-test) and after the training program (final-test). After the walk, the subjects completed the

exercise by doing ground exercises for the abdomen and legs for 10 minutes, and finally by cooling exercises for 5 minutes.

Body Weight and Height Measurement

This measurement was made using a scale with a sensitivity of 0.01 kg. the measurement was performed with the bare feet of the subjects, with their bellies hungry, and wearing only shorts. Height measurements were taken with bare feet and cm sensitivity with pharmacy type measuring instrument with a sensitivity of 0.01 cm. It has been taken with barefoot, head up, knees streched, heels and body in adjacent position. The obtained values were written in kilograms and centimeters in the information form.

Blood Parameters

With 9 male volunteers participating in the program, 12 hours before the start of the exercise program stopped eating and went to the previously diagnosed health facility to give blood. This procedure was performed by experts in the appropriate laboratory environment to examine the blood parameters (Total cholesterol, triglyceride, HDL, AST, lower, iron, total iron capacity) twice before the exercise (pre-test) and after the end of our 8-week exercise program (end-test). All numerical values of the research results were evaluated with the 'T test by calculating mean ± standard deviation.

Statistical Analysis

The values obtained were evaluated statistically using the IBM SPSS Statistics 23 License Authorization Wizard package program. The value p>0.05 was considered statistically meaningless. Independent sample t-test was used to determine differences between pre-test and end–test variables.

Findings

Table 1. Physical Characteristics of Participants Included in the Study

N	Years of Age (Mean±SD)	Size Length (cm (Mean±SD)
9	27,11±1,83	179,89±0,08

When the physical characteristics of the participants were examined in the table, age averages and length lengths were determined as 27.11±1.83 years and 179.89±0.08 cm respectively.

Table 2. Comparison Of The Preliminary Test-Final Test Results Of Some Physiological Parameters Of The Participants

Measurements (cm)	Sequences	N	Mean Rank	Sequence Total	Z	p
Weight pre-test-final test	Negative sequences	9[b]	5,00	45,00	-2,67**	,007
	Positive Sequences	0	,00	,00		
	Equal	-				
T.Cholesterol mg/dL pre-test-final test	Negative Sequences	6[b]	6,33	38,00	-1,83**	,066
	Positive Sequences	3	2,33	7,00		
	Equal	0				

Triglycerides mg/dL pre-test-final test	Negative Sequences Positive Sequences Equal	5[b] 4 0	4,40 5,75	22,00 23,00	-0,059	,953
HDL mg/dL pre-test-final test	Negative Sequences Positive Sequences Equal	5[b] 4 0	5,00 5,00	25,00 20,00	- ,296	,767
LDL mg/dL Pre-test-final test	Negative Sequences Positive Sequences Equal	8[b] 1 0	4,88 6,00	39,00 6,00	-1,95*	,050
AST U/L Pre-test-final test	Negative Sequences Positive Sequences Equal	8[b] 1 0	5,19 3,50	41,50 3,50	-2,25*	,024
ALT U/L Pre-test-final test	Negative Sequences Positive Sequences Equal	6[b] 3 0	6,42 2,17	38,50 6,50	-1,89*	,049
Iron Pre-test-final test	Negative Sequences Positive Sequences Equal	6[b] 3 0	4,50 6,00	27,00 18,00	- ,533	,059
Total Iron Capacity Pre-test-final test	Negative Sequences Positive Sequences Equal	5[b] 4 0	5,20 4,75	26,00 19,00	- ,415	,678

When the results of the study were examined, there were no statistically significant differences in weight, total cholesterol, trig, HDL, LDL, AST, lower, iron, total iron capacity levels (TRIG, HDL, iron and total iron capacity) levels in sedentary individuals (Table 2); It was found some differences (Weight, LDL, AST and lower) levels in sedentary individuals. ($p<0,05$). Table 2

Discussion and the Result

In this study, we investigated the effect of aerobic exercises on some blood parameters of 9 sedentary individuals with an average age of 27.11±1.83, body weight, total cholesterol, triglyceride, HDL, AST, lower, iron and total iron capacities of the participants in the training group who participated in walking exercises at submaximal level for 8 weeks were examined. In a 20-week aerobic exercise study conducted by Katzmarzyk and his friends 650 male and female participants aged 17-65, they examined differences in blood lipids and body fat ratio. At the end of the exercise, they found a 3.3% decrease in the body fat ratio of the participants and found a significant correlation between the differences in the body fat levels of the women and the lipid Exchange indices of LDL-K, total cholesterol, total-K/HDL-K. As a result of our 8-week study; There was no statistically significant difference between the levels of Weight, Total Cholesterol, TRIG, HDL, LDL, AST, ALT, Iron and Total Iron Capacity (TRIG, HDL, Iron and Total Iron Capacity) of the subjects participating in aerobic exercise; A statistically significant difference was found in weight, LDL, AST and ALT levels. ($p<0,05$).

Aerobic exercises have a very significant positive health effects when there is continuity in their programs. (Kin İşler and his friends., 2001). mertens and colleagues applied 12-month walking exercises to a 12-person group of subjects consisting of 4 overweight women and 8 men who had myocardial infarction, with an average age of 54,9. As a result of the study, body weight ratios of women from 70.7 kg to 65.6 kg were increased from 38.3 to 35.2, BMI from 27.2 kg / m2 to 25.2 kg / m2. -K levels decreased from 5.89 mmol / L to 5.80 mmol / L and lean body weight increased from 41.6 kg to 42.2 kg. Triglycerit did not register any changes to HDLK, LDL-K. When we compare the study of Mertens and his friends with our own study, weights, Total-K, TRIG, HDL levels show parallelism. As a result of the aerobic exercises we performed during 8 weeks, we found statistically significant difference between pre-test and final tes in LDL levels and did not show any parallels with the work of Mertens and his friends. (1998).

In the concept described as a body composition, a combination of body fat and fat-free body fat, it is known that body weight and body fat also affect blood plasma lipids as well as lipoprotetes. (Aslan ve ark., 2001). In the vast majority of similar studies in the literature, the effect of exercise alone or in combination with nutrition programs on body composition and, with it, serum lipids is notable. Moderate-level exercises affect lipid metabolism positively. body fat depots, total body weight, total cholesterol, serum triglycerides may lead to decrease in LDL-C and VLDL and may lead to an increase in HDL-C. (Ağırbaş and his friends 2009)

In general, the effects of exercise components directly and indirectly on fat metabolism and blood lipids, the effect of exercise on body composition and blood fats and the intensity of exercise, there is a direct proportional development between the duration. A similar study conducted by creating moderate run-and-walk groups of up to 50 minutes in duration showed that the lipid parameters did not change, but the group had increased HDL-C levels in 24 hours. At least 2 months of exercise programs are needed to reduce LDL and TG concentration in plasmas along with exercise, which results in the conclusion that exercise affects blood parameters not acutely but chronically. (Gökdemir, 2007).

When the results of the study were examined, there were no statistically significant differences in weight, total cholesterol, trig, HDL, LDL, AST, lower, iron, total iron capacity levels (TRIG, HDL, iron and total iron capacity) levels in sedentary individuals; It was found some differences (Weight, LDL, AST and lower) levels in sedentary individuals. ($p<0,05$). This result, which we reached in our study, supports similar views in the literature.

In similar studies in the literature, the effects of exercise on blood lipid levels and blood pressure, a significant decrease in systaltic blood pressure and change in blood lipids were observed in participants after exercise of circular training studies for chronic heart patients in middle age and older individuals as well as in the special population. (Green and his friends 2001).

In a study that investigated the effect of moderate regular exercise on cardiovascular risk factors, 3615 participants were found to have reasonable levels of resting heart beats and blood lipid levels compared to the non-exercise group of regular exercise participants. (Mahanonda and his friends 2000).

After 12 weeks of aerobic training planning, participants increased MaxVo2 values, decreased blood pressure and changes in blood lipid levels were recorded, which can be considered as the result of long-term programs and the effect of moderate-intensity exercises on sedentary individuals on these parameters. (Alan and his friends., 2000).

In a study similar to the parameters we discussed, Szmedra and her colleagues assessed a 3.4% decrease in the total weight values and the process of terminating the training program before starting the training application and recorded that these results were statistically significant in the treadmill exercise planning applied to middle age female participants.

In similar study, with the 24 week durability and aerobic integrated exercise program were applied to 31 healthy women in 5 days a week. a significant reduction in total weight was observed at the end of the training (Nindl and his friends., 2000).

Another study of a similar nature showed that short-term exercises did not produce significant changes in blood parameters, and that the 20-day camp period did not statistically lead to change and development in HCT and HGB blood parameters. (Mashiko and his friends., 2004).

In a popular study which was done by Unal (1998) , he found no statistically significant differences in the PLT levels after 8 weeks of chronic aerobic exercise (P>0.05). In the study, there were no statistically significant (p>0.05) differences in PLT levels after chronic exercise applied to sedentary individuals. The effect of aerobic exercise on some blood parameters of sedentary individuals was investigated and as a result, the findings of our study showed that short-term submaximal level exercises in sedentary individuals included weight, total cholesterol,TRIG, HDL, LDL, AST, ALT, Iron.It did not cause statistically significant changes in the levels of total iron capacity (TRIG, HDL, iron and total iron capacity); it did cause statistically significant differences in the levels of (weight, LDL, AST and lower) (P>0.05). It is thought that the submaximal and maximal level exercises applied on sedentary or active athletes will not be greatly improved in terms of change and development in short-term training programs, and in fact the exercises may react in terms of duration, severity, frequency and scope differently.

Recommendations

The aim of this study is to evaluate the effects of mid-level violence and maximal exercises on blood parameters besides the submaximal level, to classify the participants according to anthropometric and motoric characteristics and compare them according to these parameters, to increase the duration and intensity of exercise., it can be considered and recommended that the field of study can contribute to writing whether acute and chronic blood pressure is followed and influences these outcomes, and that the next researcher can contribute to science as well. In order to obtain more healthy information, it may be recommended to increase the studies in this field in order to encourage sedentary individuals to sport and healthy life by applying different procedures and different methods as mentioned.

REFERENCES

Aktürk A. (2017). Exercise motivation in the elderly candidate and the elderly and examination of basic psychological needs in exercise. Published Master's Thesis, Kırıkkale University Institute Of Health Sciences, Kırıkkale.

Ağırbaş, Ö., Kishalı, N.F., Çolak, M. (2009). The effect of body compositions of male handball players on blood Lipid and Lipoprotein levels during the competition period, Journal of the Institute of natural and Applied Sciences, 2 (2), 133-151.

Alan, C., Utter, David, C., Whitcomb, David, C., Nieman, Diane, E., Butterworth, and Scot, S., Vermillion, (2000). Effects of Exercise Trainning on Gallbladder Function In An Obese Female Population, Medicine Science In Sports Exercise, 32(1):41-45

Arslan, E., Kelle M., Baylan Y., Diken H., Atmaca, M., Tümer, C., Obay, B., Şermet, A. (2001). Comparison of Plasma Lipid Levels Among Athletes and Controls. Dicle Medical Journal (Journal Of Medical School) 28(1), 23-34.

Büyükyazı G, Karadeniz G, Kutlu N, Çabuk M, Ceylan C, Özdemir, E. (2002). Effect Of Chronic Training On Serum Iron, Magnesium, Hematologic And Lipid Parameters In Elder people. Association of sports physicians ,37, 51-59

Booth FW., Hargreaves M. (2011). Understanding Multi-Organ Pathology from Insufficient Exercise, Journal of Applied Physiology, 11(4), 1199–1200.

Demiriz M, Erdemir İ, Kayhan RF. (2015). Effects of anaerobic Interval training on aerobic capacity, anaerobic threshold and blood parameters at different resting intervals. Sports, Exercise and Training Science, 1 (1), 1-8.

DeSouza C., Shapiro LF., Clevenger CM., Dinenno FA., Monahan KD., Tanaka H., Seals DR. (2000). Regular Aerobic Exercise Prevents and Restores Age-Related Declines in Endothelium-Dependent Vasodilation in Healthy Men. American Heart Association, 102, 1351-1357.

Gültekin C. (2018). Comparison of Basic Strength Performance In Terms Of Some Strength Tests Of Those Who Exercise On An Empty Stomach In Fitness Applications And Those Who Exercise After Different Hours Of Eating. Published Master's Thesis, Istanbul Gelisim University Institute Of Health Sciences, Istanbul.

Green, D.J., Watts, K., Maiorana, A.J., Driscoll, J.G. (2001). A Comparison of Ambulatory Oxygen Consuption During Circuit Training and Aerobic Exercise in Patients with Chronic Heart Failure, J. Cardiopulm Rehabil., 21(3):167-174.

Gökdemir, K., Koç, H., Yüksel, O. (2007). The Effect of Aerobic Training Program on Body Fat Ratio with Some Respiratory and Circulation Parameters of University Students, Egzersiz Çevrimiçi Journal, 1(1): 45-49.

Göksu ÖC., Harutoğlu H., Yiğit Z. (2003). Effect of 10-week exercise program on Physical Fitness and blood parameters applied to sedentary individuals. Istanbul University Journal Of Sport Sciences, 11 (3), 18-23.

Karacan S., Çolakoğlu FF. (2003). Effect Of Aerobic Exercise On Body Composition Of Blood Lipids In Sedentary Middle Age Women And Young Women. SPORMETRE Journal of Physical Education and Sports Sciences, 1(2), 83-88.

Katzmarzyk, P.T., Leon, A.S., Rankinen, T., Gagnon, J. (2001). Changes in Blood Lipids Consequent to Aerobic Exercise Training Related to Changes in Body Fatness and Aerobic Fitness. Metabolism, 50(7), 841-848.

Kin A, Koşar N, Aşçı H. (2001). Effect of participation in 10 Week Step Program on physical fitness of male and female students. Hacettepe University Journal Of Sport Sciences, 12 (4), 18-25.

Kılıç Toprak E. (2015). Determination of the effect of exercise and subsequent exercise detraining process on nitric oxide and carbon monoxide levels and expression of genes involved in their synthesis in spontaneous hypertensive rats. Published Doctoral Thesis, Pamukkale University Institute Of Health Sciences,, Denizli

Lindwall M. (2004). *Exercısıng The Self: On The Role Of Exercıse, Gender And Culture In Physıcal-Self Perceptıons.* Published Doctoral Dissertation, Department of Psychology Stockholm University, Stockholm.

Mertens D.J., Kavanagh T., Campbell R.B., Shephard R.J. (1998). Exercise Without Dietar, Restriction as a Means to Long-Term Fat Loss in the Obese Caradiac Patient. The Journal of Sports Medicine and Physical Fitness. 38(4), 310-316.

Mahanonda, N., Bhuripanyo, K., Leowattana,W. (2000). Regular Exercise and Cardiovascular Risk Factors, J. Med. Assoc. Thai., 83(2): 153-158.

Mashiko T, Umeda T, Nakaji S, Sugawara K ,et all;Effects Of Exercise On The Physical Condition Ofcollege Rugby Players During Summer Training Camp Br J Sports Med;,38:186–190. Doi: 10.1136/Bjsm..004333 2004

Nindl B.C., Harman, E.A., Marx, J.O. (2000). Regional body composition Changes in women after 6 months of periodized physical training, Journal of Applied Physiology, 88(6):2251-2259.

Szmedra, L., Lemura, L.M. Shearn, W.M. (1998). Exercise Tolerance, Body Composition and Blood Lipids in Obese African–American Woman Following Short– Term Training, The Journal of Sports Medicine and Physical Fitness, 38:59 –65.

Tran ZV., Weltman A. (1985). Differential Effects of Exercise on Serum Lipid and Lipoprotein Levels Seen With Changes in Body Weight. The Journal of the American Medical Association, 254(7), 919-924.

Ünal, M. (1998). Effects of Aerobic and Anaerobic Acute-chronic Exercises on Immune Parameters I.U. Institute of Health Sciences,20, Istanbul