

## The Effect of Aerobic Exercises on Cardiovascular Risk Taking Factors in Hypertension Men

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### Abstract

*Cardiovascular Diseases are accounted one of the most important factors of mortality. Increasing blood pressure and blood fat are taken into account the most significant risk taking factors of Cardiovascular Diseases. The purpose of this study was examining the effectiveness of 8-week Aerobic exercises on some of Cardiovascular Risk Taking factors in men with hypertension. 20 volunteer men (40- 60 aged) suffering from high blood pressure with 1 to 5 background were chosen randomly and they were divided into two groups: experimental group (10 people) and control group (10 people). The experimental group participated in a period of a eight-week aerobic exercises, three sessions a week, and 35 minutes per session, with the intensity of %60 to %80 maximum heart rate in each session but the control group did not participated in any session. Each group was taken primarily blood sampling without eating breakfast (pre-test) and a post-test was taken after a day of last exercise session. Systole and diastole blood pressure were measured in first session and a day after last session of exercise, too. For describing and explaining data, the methods of the Descriptive Statistics and the Deductive Statistics were applied for examining the Normal Distribution, independence  $t$  for pre-tests and post-tests of two groups and the comparison of two groups' changes, dependence  $t$  for comparing pre-test and post-test of two groups. The meaningful level of  $P < 0.05$  was considered. In the experimental group was seen the meaningful decreasing in the amount of cholesterol (TC), triglyceride (TG), blood light lipoprotein (LDL), and systole blood pressure (SBP), and blood heaven lipoprotein (HDL) had meaningful increasing. Moreover, the amount of diastole blood pressure (DBP) decreased but these were not meaningful changes. Therefore, using aerobic exercises have desirable effects on decreasing risk taking factors. Thus, they lead to deduce the occurrence of cardiovascular diseases.*

**Key words:** Aerobic exercises, Cardiovascular Risk Taking Factors, and Hypertension.

### Introduction

Cardiovascular diseases (CVD) are the most important factors that lead to mortality in the world (16). Hypertension (6, 12 and 3), overweight and fatness (6, 13), low movement (17, 6), being high of blood harmful fats (3, 6), unsuitable food habits such as overusing of salt and high calorie diet (16) increase the possibility of cardiovascular diseases. High blood pressure is called systole blood pressure 140 milliliter mercury and higher than it and called diastole blood pressure 90 milliliter mercury and or higher than it (3). Researchers have reported that high blood pressure had been out of controlled in all around the world, as in past 20 years have taken over one billion people to the number of suffering from this disease (11). According to the study of Luis and et al. in 2012, improving life style leads to decrease the possibility of appearing Cardiovascular Diseases and it plays as a preventive in this ground. Forming useful changes in diet and enhancing body activity level cause to deduce the weight of people who have overweight or who are fat and also cause to deduce blood harmful fats like triglyceride (TG) and blood LDL (7). Numerous epidemiology investigations have shown that increasing body activity deduces the risk of suffering to Cardiovascular Diseases in people and the probability of suffering inactive people to Cardiovascular Diseases is more than active people (17). It could be attributed the risk decreasing mechanism (CVD) after body activity to decrease factors such as body weight, blood pressure, LDL, TC and increasing HDL (10). In study of Rahman Suri and et al. in 1384, 20 patients (25-65 aged) suffering from blood pressure were divided into two control and experimental groups. Control group participated in an eight- week aerobic exercise plan.

At the end of this study, it was resulted that: LDL, TC, and TG decreased meaningfully but blood HDL not only did not show blood HDL meaningful increasing but also it decreased (15). As above study, another study by Akbari and et al. was done in 1386. In this study the effect of the eight-week aerobic exercise planning was investigated on decreasing blood serum fats of men with high blood pressure. The results of study showed that TG, TC, and LDL decreased meaningfully after eight-week aerobic exercise ( $p < 0.05$ ) but HDL did not show meaningful increase and in control group did not show meaningful changes any above variables (1). Amin Shokravi and et al investigated in 2011 the effects of the exercise in appearing cardiovascular diseases in women. In this study twenty women with 40- 55 aged run on the revolving band (the experimental group) for 12 weeks, 3 sessions in a week and for 30 minutes (with the intensity of 70% to 80% of heartbeat maximum). This study showed that systole and diastole blood pressure and risk of cardiovascular diseases and blood harmful fats has had meaningful decrease (2). Fleg (2012) during a study with the title of “Aerobic exercise in old people: the success key in increasing lifetime” stated that: Aerobic exercises have useful effects on blood pressure, blood harmful fats, Glucose tolerate, bone density, stress and psychical pressure and life quality of old (3). Pooksi and et al (2012) have mentioned in their own study of aerobic body activity as a prescription for rejuvenating blood-vessels and in continuation, they have referred to the positive effects of aerobic body activity on cardiovascular diseases risk taking factors such as blood pressure, overweighting, blood sugar and fat (14).

The goal of Benklass Green’s (Green et al, 2012) study was examining the effects of persevering exercises (12-week and 3 sessions in per week) on blood fats of fat men and women (25 – 45 aged). The results of this study showed that the amount of HDL, the proportion of HDL to cholesterol and max, body overweighting, LDL, and TC have decreased (5). With regard to the importance of control and decreasing risk taking factors in cardiovascular diseases in middle-aged, it is necessary that, some studies are done about the effect of different exercises in some cardiovascular diseases risk taking factors (TC, TG, LDL, HDL, SBP, and DBP) in order to record the appearing changes on each of factors in consequence of these kinds of exercises, in this manner, perhaps, it could be present a suitable exercise planning for preventing of cardiovascular diseases for people. For this reason, this study wants to examine the effect of aerobic exercise eight-week on cardiovascular diseases risk taking factors and high blood pressure in men.

## **Method**

The procedure of this study was half-experimental in form of pre-test and post-test. Statistics of patients who suffering from high blood pressure (more than 90, 140 millimeter mercury), consultants to medical centers and Medicare in Talleh city in 1390, that they had not any cardiovascular diseases, diabetes, heart failure and brain failure.

During 3 months reporting from expert physicians among them, 20 voluntary men 40-60 aged were chosen with available selective sampling method and were divided into two experimental (10 people) and control (10 people) groups. Through a questionnaire in which distributed among patients, their personal information and medical backgrounds were collected. Before receiving testimonial from examinees, necessary information about the way of research performance and some points in which should follow by them for participating in this study were given them away orally. After the explanatory session, by tape-measure the height of patients were measured according to centimeter and by the Sega product scales made in Germany the weight of patients were measured according to kilogram. By using clinical standard methods the systole and diastole blood pressure were measured in resting manner and without stress 3 times per 5 minutes by mercury pressure gauge in beginning of exercise plan (pre-test) and a day after last exercise session (post-test). The blood biochemistry factors including cholesterol (TC), triglyceride (TG), high density Lipoprotein (HDL) and low density Lipoprotein (LDL) were measured. The aerobic exercise planning was containing running with 60% to 80% intensity of heart beat maximum, 3 sessions in a week, and each session for 35 minutes. Each exercise session was comprised three parts (10 minutes for tensional motions and gym for warming up, 20 minutes aerobic exercise, for chilling 5 minutes).

The exercise planning was in first and second weeks with 60 percent intensity maximum heart beat, and every week was added 5 percent to its intensity. For preventing of possible risks were examined the heart beat and blood pressure exercise and after it until the intensity of during exercise does not raise the expected limitation up. It was commended to the patients in which stop the exercise as they feel pain in their jaw, neck, shoulder and chest. The examinees’ heart beat numbers were measured by fastening Telmeteri machine to around the examinees’ breast, so that the exercise intensity was controlled.

After collecting data from SPSS software, prescription 15 for analyzing data was applied. By using mean and data standard deviation were calculated by descriptive statistics. Detective statistics including Luis test was used for homogeneity of group variance, Kalmogorov-Smiranov Test for examining data natural distribution, independence t was used for comparing two pre-tests and post-tests groups and comparing two groups' changes, dependence t was used for comparing pre-tests and post-tests of each groups. The meaningful level of examining tests was considered  $p < 0.05$ .

### Results

The description of individual properties have presented in experimental and control groups in table 1.

Table 1- describing individual properties of experimental and control groups

| Mean $\pm$ SD    | groups       | Variable           |
|------------------|--------------|--------------------|
| 50 $\pm$ 7.36    | experimental | Age(year)          |
| 48.8 $\pm$ 7.75  | control      |                    |
| 168 $\pm$ 7.14   | experimental | Height(centimeter) |
| 172.6 $\pm$ 8.19 | control      |                    |
| 75.5 $\pm$ 8.6   | experimental | Weight(kilogram)   |
| 73.6 $\pm$ 7.72  | control      |                    |

As presented in table 2, test results showed that the 8 weeks aerobic exercise on all of the study variables have had meaningful effects but these changes in control groups were not meaningful (table 2).

Table 2- the study's variables changes in pre-test and post-test (control and experimental groups, correlated t)

| The amount of P | Change amount | Correlated t | Mean $\pm$ SD                     |                                   | group        | Variable                           |
|-----------------|---------------|--------------|-----------------------------------|-----------------------------------|--------------|------------------------------------|
|                 |               |              | Post-test                         | Pre-test                          |              |                                    |
| 0/005           | -%10.9        | 3/712        | <b>137.7<math>\pm</math>7.39</b>  | <b>152.8<math>\pm</math>16.87</b> | experimental | SBP systole blood pressure mmHg    |
| 0/962           | -%1.1         | 0/49         | <b>149.5<math>\pm</math>15.53</b> | <b>149.6<math>\pm</math>14.36</b> | control      |                                    |
| 0/045           | -%7.3         | 2/016        | <b>82.1<math>\pm</math>5.76</b>   | <b>87.9<math>\pm</math>4.78</b>   | experimental | DBP diastole blood pressure mmHg   |
| 0/621           | -%2.8         | 0/511        | <b>83.3<math>\pm</math>7.48</b>   | <b>84.8<math>\pm</math>8.52</b>   | control      |                                    |
| 0/000           | -%22.5        | 10/056       | <b>167.1<math>\pm</math>31.1</b>  | <b>212.6<math>\pm</math>41.26</b> | experimental | TC cholesterol Mg/dl               |
| 0/069           | + % 9.9       | -2/064       | <b>199.2<math>\pm</math>36.67</b> | <b>181.2<math>\pm</math>33.5</b>  | control      |                                    |
| 0/005           | -%15.9        | 3/663        | <b>159.8<math>\pm</math>28.88</b> | <b>187.6<math>\pm</math>34.83</b> | experimental | TG triglyceride Mg/dl              |
| 0/219           | + %3.8        | 1/320        | <b>185.4<math>\pm</math>23.68</b> | <b>178.6<math>\pm</math>28.86</b> | control      |                                    |
| 0/000           | -%9.3         | 5/293        | <b>109.4<math>\pm</math>9.37</b>  | <b>119.3<math>\pm</math>10.83</b> | Experimental | LDL low density lipoprotein Mg/dl  |
| 0/208           | + %1.5        | -1/355       | <b>121.5<math>\pm</math>14.53</b> | <b>119.6<math>\pm</math>14.36</b> | control      |                                    |
| 0/001           | + %21.7       | 4/676        | <b>43.9<math>\pm</math>9.84</b>   | <b>35.4<math>\pm</math>10.56</b>  | experimental | HDL high density lipoprotein Mg/dl |
| 0/054           | -%10.8        | 2/215        | <b>36.3<math>\pm</math>6.39</b>   | <b>40.2<math>\pm</math>10.61</b>  | control      |                                    |

The test results in comparing experimental group with control group showed, there is not any meaningful difference in study variables in the pre-test but this difference was meaningful in post-test (table 3).

**Table 3- the study's variables changes in comparing control group with experimental group in pre-test and post-test**

| The amount of P | independence t | Mean $\pm$ SD     |                    | Test stage | Variable                          |
|-----------------|----------------|-------------------|--------------------|------------|-----------------------------------|
|                 |                | Control group     | Experimental group |            |                                   |
| 0/653           | 0/457          | 149.6 $\pm$ 14.36 | 152.8 $\pm$ 16.87  | Pre-test   | SBP systole blood pres mmHg       |
| 0/044           | -2/169         | 149.5 $\pm$ 15.53 | 137.7 $\pm$ 7.39   | Post-test  |                                   |
| 0/974           | 0/032          | 84.8 $\pm$ 8.52   | 87.9 $\pm$ 4.78    | Pre-test   | DBP diastole blood pressure mmHg  |
| 0/693           | -0/402         | 83.3 $\pm$ 7.48   | 82.1 $\pm$ 5.76    | Post-test  |                                   |
| 0/07            | 1/68           | 181.2 $\pm$ 33.5  | 212.6 $\pm$ 41.26  | Pre-test   | TC cholesterol Mg/dl              |
| 0/048           | -2/121         | 199.2 $\pm$ 36.67 | 167.1 $\pm$ 31.1   | Post-test  |                                   |
| 0/537           | -0/269         | 178.6 $\pm$ 28.86 | 187.6 $\pm$ 34.83  | Pre-test   | TG triglyceride Mg/dl             |
| 0/044           | -2/167         | 185.4 $\pm$ 23.68 | 159.8 $\pm$ 28.88  | Post-test  |                                   |
| -2/212          | -0/053         | 119.6 $\pm$ 14.36 | 119.3 $\pm$ 10.83  | Pre-test   | LDL low density lipoprotein Mg/dl |
| 0/040           | 0/959          | 121.5 $\pm$ 14.53 | 109.4 $\pm$ 9.37   | Post-test  |                                   |
| 2/189           | 0/771          | 40.2 $\pm$ 10.61  | 35.4 $\pm$ 10.56   | Pre-test   | HDL high blood lipoprotein Mg/dl  |
| 0/042           | 0/451          | 36.3 $\pm$ 6.39   | 43.1 $\pm$ 9.84    | Post-test  |                                   |

### Conclusion

The results of this study showed that the 8 weeks aerobic exercise could reduce systole and diastole blood pressure 9, 10, and 7.3 percent, respectively. It can be related to the reduction of blood pressure arising from aerobic exercise to reduce Ton sympathetic and to increase Ton parasympathetic, to reduce produced Katekellamines at the result of exercise, to repel of sodium and to reduce body liquid volume, to regulate exuding over-kidney hormones and in conclusion to reduce blood-vessel resistance (4) in which the results of present study confirms these matters. Moreover, the results of this study showed, aerobic exercises in reducing TC (22.5%) and TG (15.9%) have had meaningful effect. Being low the level of triglyceride in blood leads to increase of Lipaz lipoprotein activity in skeleton muscles and fat texture and this change obtains in consequence of aerobic exercise. Lipaz lipoprotein is a key enzyme for simplification lipoproteins containing large amount of triglyceride. Reducing body fat in which happens in consequence of preserving activities might be an effective factor in reducing triglyceride caused by body activity (9) and the cholesterol level of people who do aerobic exercises with high intensity in comparing with people who do exercises with low intensity is lower (9 and 2). Among those studies that they were favorable with TC and TG in control group have decreased to 18% and 24%, respectively (1). Furthermore, in study of Rahman Suri and et al. the amount of TC, TG and blood LDL meaningfully reduced after performing the 8 weeks aerobic exercise by men patients with hypertension (25-65 aged).

Other results of this study showed that aerobic exercises have had meaningful effects on decreasing blood LDL (9.3%) and increasing HDL (21.7%). Most of the carried studies out were favorable with the present study such as the study of Nicholas Green (2012) in which it was done with the aim of examining the effect of preserving exercises with intensity of 70 percent and maximum of consumption oxygen ( max) in fat men and women (2.5 45 aged) and it showed that after 12 weeks exercise, the amount of LDL and TC decreased and the amount of blood HDL had meaningful increasing (5) and or it can be referred to the study of Akbari that after performing the 8 weeks aerobic exercise in staff men (35-55 aged) the amount of LDL decreased 22% but HDL did not show meaningful increasing (1). Also, in the study of Rahman Suri after performing the 8 weeks aerobic exercise by men patients (25-65 aged) the amount of TC, TG and LDL reduced meaningfully (2). Among the mentioned studies as stated in the study of Akbari, the amount of HDL did not have meaningful increasing and it is inconsistent to present study from this point of view, may be its reason is the lower intensity of aerobic exercises in it, as it only leads to reduce harmful fats and for increasing blood HDL has not sufficient.

Lingard and et al. examined the effect of strength and preserving exercises on some of risk taking factors, in a study, for this reason, examinees practiced 3 sessions in a week and for 16 weeks. The results of this study showed that decreasing cholesterol and LDL and increasing HDL in the group of preserving exercises have been meaningful but in the strength exercises only the amount of triglyceride and HDL had been improved meaningfully (8).

Since, current national advices for preventing and curing high blood pressure emphasis on curing nonmedical of these patients called “Improving the life style”, regular aerobic body exercises can be set as a proper instruction. The present study results with epidemiology studies have congruence and it states that the aerobic exercises lead to inducing cardiovascular diseases risk taking factors.

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