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COMPARISON OF CARDIOVASCULAR RISK FACTORS IN ACTIVE AND INACTIVE ELDERLY MEN

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ABSTRACT

Advancement of Science and Technology facilitates the human life, but these developments have led to some problems. Inactivity is one of the problems caused by scientific progresses. This impairs glucose and lipid metabolism and consequently leads to cardiovascular diseases. This study investigates the cardiovascular risk factors in 60-85 years old men in relation to some physical activities. Forty-five elderly male volunteers were assigned to active 1 (one session per week), active 3 (three sessions per week) and inactive groups. To determine the levels of blood factors, venous blood samples were collected. After measuring desired variables, data were collected and analyzed using SPSS. One-way ANOVA was used for between-groups comparison and the level of significance was considered $P < 0.05$. The results showed that the levels of triglycerides, cholesterol, VLDL, LDL and glucose in active 1 group were lower than inactive group, and this difference was significant. Also HDL levels in active 1 group were higher compared to inactive group subjects, and this difference was statistically significant. Glucose and lipid metabolism was better inactive 2 group compared to active 1 group, and in many cases the differences were significant. Therefore physical activity improves glucose and lipid metabolism and prevents the risk of cardiovascular diseases in elderly men.

Keywords: Physical Activity, Lipid Profile, Blood Glucose, Elderly Men

INTRODUCTION

Although improvements in science and technology will facilitate human life, it may create many problems. Most of the scientific

advances and discoveries has reverse relations with human activities. Inactivity is one of the most important problems in

developed countries, which is followed by increased diseases [1, 2]. With increasing age some alterations occur in different parts of the body and the body loses its ability gradually. Immune system and other organs show less activity and the body becomes vulnerable. Ageing is an inevitable period of life of people, but by observing some simple tips you can spend it more healthy. One of the factors is proper nutrition and mobility during life at all times [3].

Cardiovascular diseases, mainly coronary artery disease, are the main causes of death in the new century and the leading cause of death in Iran [4]. So the best way to deal with such diseases is to know and reduce their risk factors. In recent decades, much attention has been paid to the lipid profile status and its related compounds in healthy and patient subjects' plasma [5-7]. Plasma lipid levels are influenced by age, gender, lifestyle, dietary habits, physical activity, obesity, smoking, hormonal disorders and some genetic factors [8]. The results of some studies have shown that physical activity reduces the risk of cardiovascular disease. Also inactivity increases the risk of cardiovascular disease and it increases the probability to develop other risk factors such as high blood pressure, inactivity, diabetes and obesity [9-12]. In addition to physical activity, lifestyle changes also can be considered as a key factor in lowering

blood pressure and improving lipid metabolism [13-15].

One of the major challenges for being healthy is adopting an active lifestyle. The benefits of regular physical activity and exercise are often underestimated because of the changes in lifestyle in the past decades. Increased physical fitness decreases risk of cardiovascular diseases up to 50% [16-19]. Regarding the above mentioned tips, the necessity of physical activity and exercise is recommended. Accepting the fact that exercise is an effective way to improve lipid and glucose metabolism the question arises whether exercise is also effective in the elderly? So according to the presented material and different research it is necessary to examine cardiovascular risk factors in active compared to inactive elderly in this study.

MATERIALS AND METHODS

Of the 260 elderly men who were in a rehabilitation center in Jahrom 45 subjects voluntarily participated in the research and were assigned into active 1 (one session per week), active 3 (three sessions per week) and inactive groups. They were 60-85 years old. Subjects voluntarily consent to participate in the study and completed a medical questionnaire and objectives of the study were explained to them. Other data required for this study was obtained by measuring the variables height by a T ruler,

weight by a scale, and then to measure cholesterol levels, triglycerides, LDL, HDL and FBS fasting blood samples were prepared. VLDL levels were measured based on the relationship of ($VLDL = TG/5$).

The data were statistically analyzed using SPSS software. Descriptive statistics were used to plot graphs and tables and to determine averages. In inferential statistics data distribution normality was investigated by Kolmogorov-Smirnov test. Then ANOVA test was used for means comparison followed by the Tukey test for multiple comparisons between different groups and the significant level was considered $p \leq 0.05$. Given the mean and standard deviation, graphs were drawn using Excel. The chart columns that have at least one common letter are not significantly different.

RESULTS

Table 1 presents subjects' physical characteristics in different groups. Differences in subjects' weight, height and age are in a small range and the averages are almost the same in all groups. Based on these findings, we conclude that weight, height and age do not influence the test results so much and the changes are due to physical activity as the independent variable.

Figure 1 shows the changes in triglyceride levels. Triglyceride levels in both active

groups were lower than in inactive group, and this difference was significant. Also, the levels of triglycerides in active group 3 were lower than in active group 1, but this difference was not statistically significant.

Figure 2 shows the changes in cholesterol levels. Cholesterol levels in both active groups were lower than in the inactive group, and this difference was statistically significant. Also the levels of cholesterol in inactive group 3 were lower than inactive group 1, but this difference was not statistically significant.

Figure 3 shows changes in VLDL. Its levels were lower in both active groups than in inactive group, and this difference was statistically significant. Also VLDL values in active group 3 were lower than inactive group 1, but this difference was not statistically significant.

Figure 4 shows the changes in LDL levels. LDL levels in both active groups were lower than in inactive group, and this difference was statistically significant. The LDL levels in active group 3 were lower than in active group 1 but this difference was not statistically significant.

Figure 5 shows the changes in HDL levels. HDL levels were higher in both active groups compared with inactive group and the difference was statistically significant. HDL levels were higher in active group 3

than in active group 1 and this difference was statistically significant.

Figure 6 shows the changes in FBS levels. FBS levels in both active groups were lower than in inactive group and this difference

was statistically significant. The FBS levels in active group 3 were lower than in active group 1 and this difference was statistically significant.

Table 1: Participant Characteristics at Baseline

Groups	Weight (kg) Mean±SD	Height (cm) Mean±SD	Age (year) Mean±SD
Inactive (IA)	78.40±11.27	172.26±4.39	71.66±7.47
Active 1 (A1)	67.13±8.27	170.53±5.39	68.40±7.87
Active 3 (A3)	73.46±12.24	171.73±6.87	70.73±8.89

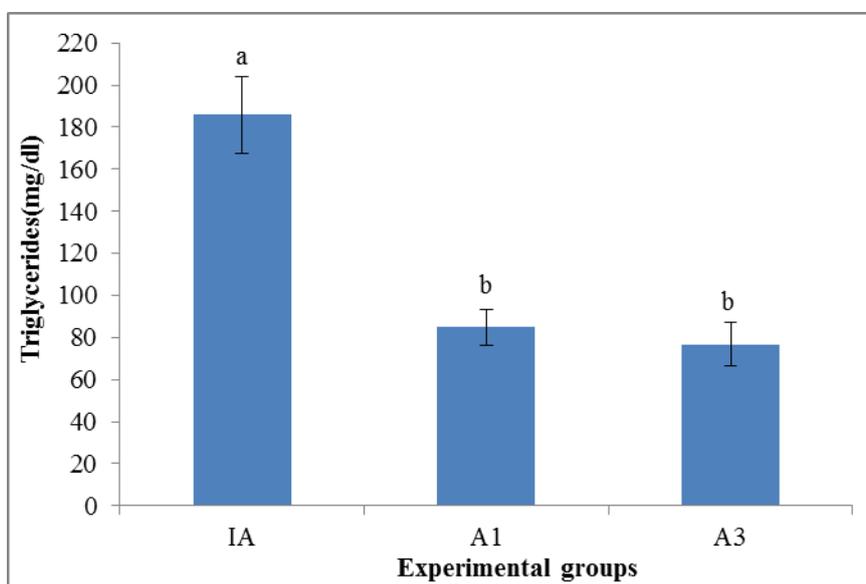


Figure 1: Changes in triglyceride levels in the study groups

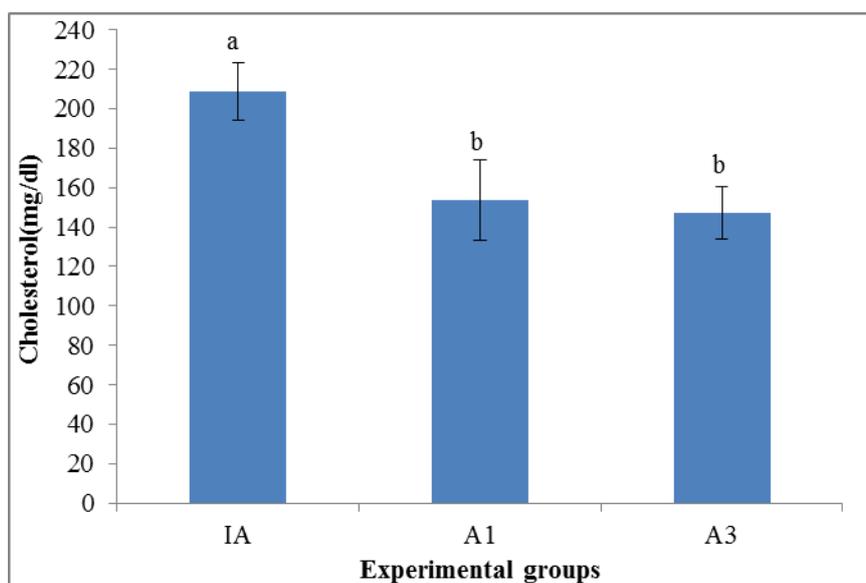


Figure 2: Changes in cholesterol levels in the study groups

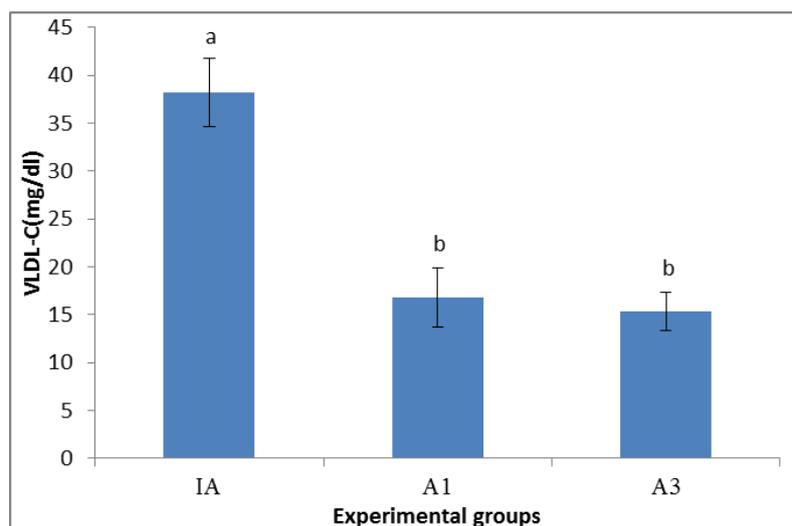


Figure 3: Changes in VLDL in the study groups

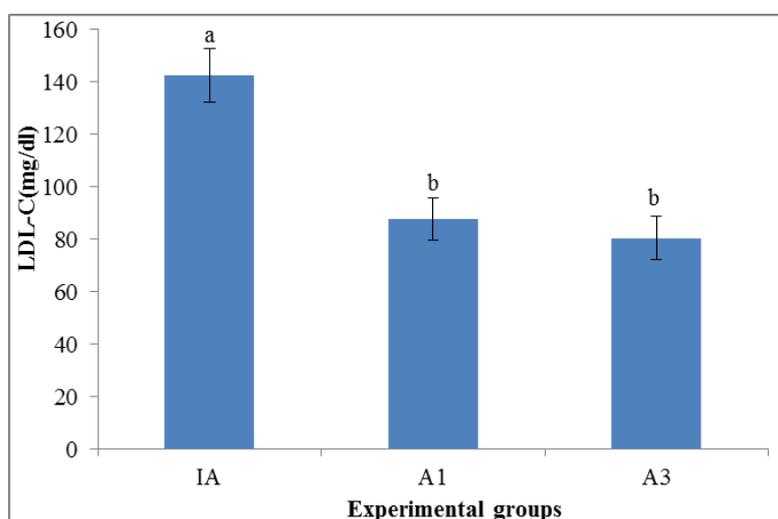


Figure 4: Changes in LDL in the study groups

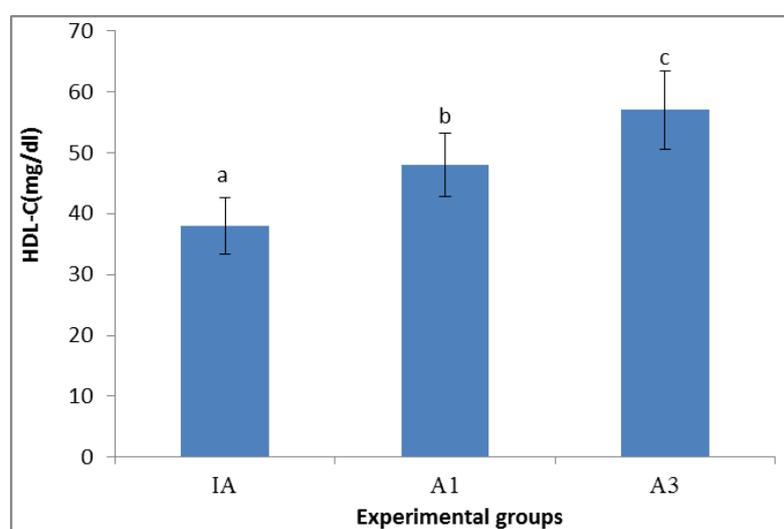


Figure 5: Changes in HDL in the study groups

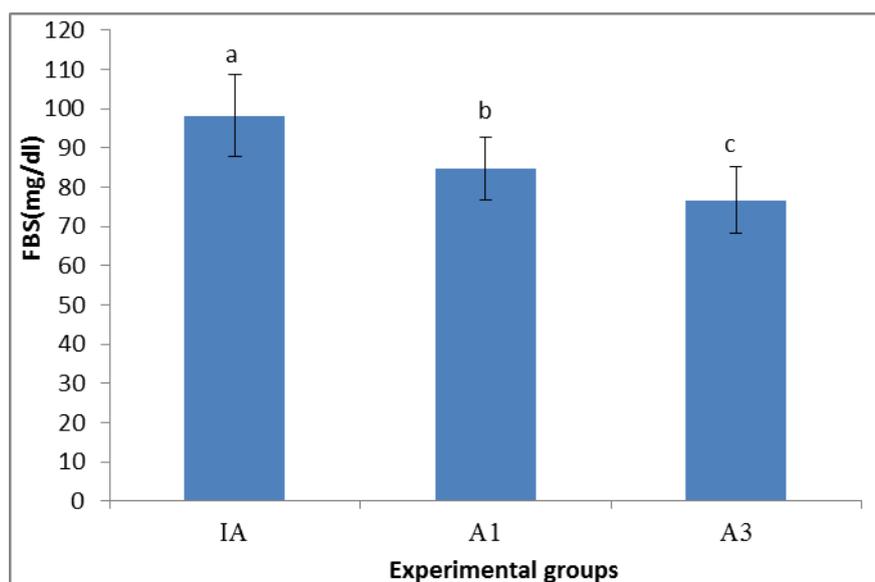


Figure 6: Changes in FBS in the study groups

DISCUSSION

Comparing people lifestyles in past and present shows the association between progresses in science and technology and decreased physical activity followed by a variety of diseases and problems including cardiovascular ones. Among the problems caused by low mobility is impaired glucose and lipid metabolism followed by the risk of cardiovascular complications.

The research studies the effect of physical activity on lipid and glucose metabolism in the elderly. The findings show that levels of TC, TG, LDL, VLDL and FBS, respectively, were lower in active group 3 than in active group 1, and these levels were lower in active group 1 than in inactive group, so perhaps physical activity and exercise can have a positive impact on levels of glucose and lipids. Levels of HDL known as an anti-atherosclerotic agent were higher in active group 3 than in active group

1. Its levels were also significantly higher in active group 1 than in inactive group. The lipoprotein lipase enzyme makes fatty acids free from triglycerides, fatty tissues and muscles, and increases the catabolism of triglycerides and rich-triglyceride lipoproteins, and increases the triglycerides uptake from the blood stream. Even the absence of changes in body composition reduces triglyceride levels.

Triglycerides are synthesized from food or by the liver. Triglycerides absorbed by intestinal are synthesized to fatty acids in the body and are used for muscles energy-consumer or absorbed by fat cells and then converted to triglycerides again and stored for future energy supply [21]. Lipoprotein lipase, is an enzyme which plays a major role in VLDL conversion to HDL. Its activity increases due to the amount of physical activity. Increased lipoprotein lipase activity causes increased lipolysis and

increases HDL levels and reduces the risk of cardiovascular disease [20].

Physical activity increases the body sensitivity to insulin. Insulin secretion absorbs glucose and changes it into glycogen and stores it in the liver. Thus those who exercise regularly have lower blood sugar levels than inactive ones [22-24]. Since many active elderly people have the functional specifications of young ones, so physical fitness can delay ageing process [25].

CONCLUSION

Physical activity is effective in improving community health and helps enhance the quality of life. So elderly population health increases if their regular physical activity, nutrition, and mental states are considered.

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