European Journal of Business and Social Sciences, Vol. 3, No.3 , pp 82-87, **June 2014.** **P.P. 82 - 87**
URL: *http://www.ejbss.com/recent.aspx*
ISSN: 2235 -767X

THE EFFECT OF AEROBIC EXERCISE ON INTERCELLULAR AND CARDIOVASCULAR ADHESION MOLECULES IN MIDDLE-AGED WOMEN

Fatemeh Kasraee

Dep. Of Physical Education,
Neyriz Branch, Islamic Azad University, Fars, Iran
eMail: fatemehkasraie_varzesh@yahoo.com

INTRODUCTION

The coronary deficiency has been identified as one of the major disease of the today's industrial countries (Mogharnasi et al., 2010). Human being's health and his disease have always been among the primary concerns of the researchers. Cardiovascular deficiencyas one of human's disease causes the death of over 12 million people worldwide annually (Mogharnasi et al., 2010). Thus, inactivity can lead to cardiovascular risk factors which in turn and due to lack of activity may cause the attenuation of intercellular and cardiovascular adhesion molecules (Sabatir et al., 2008).

Five major families of adhesion molecules have been identified. They include:Integrins, molecules of the immunoglobulin super family, Selectins,Myosins, and Cadherins (Alizadeh et al., 2004).

In a research study the effect of aerobic exercise on intercellular adhesion molecule in older men was investigated. The results of the study failed to show any meaningful influence of aerobic exercise on intercellular adhesion molecules (Mogharnasi et al., 2013).

In another study the researchers have concluded that changes in levels of cholesterol, lipoprotein of low density, vascular adhesion moleculesare possible if the exercise is performed with 60 to 65% of heart rate reserve. On the other hand, although the subjects' changes in fat percentage, weight and central obesity take place in parallel with an increase in the levels of vascular adhesion molecules, it is possible that they do not reveal a meaningful correlation within younger men (Zabet et al., 2010).

Therefore, it could be said that lack of physical activity which is the result of such factors as new lifestyles induces individuals to dormancy. Lack of balance between energy intake and its consumption which is the result of lack of physical activity and is associated with weight gain and obesity can lead to an increase in the blood lipids and intercellular adhesion molecules inflammatory markers (Ziccardiet al., 2002).

Significance of the study

Research has shown a strong relationship between inflammatory markers (new cardiovascular markers) and occurrence of cardiovascular diseases. Any decrease or increase in the level of these markers can be associated with inhibition or occurrence of cardiovascular disease (Mogharnasi&Gaeeni, 2009).

Regular aerobic exercise has an important role in reducing the rate of cardiovascular disease. Also, exercising, proper care, and medical examinations are among the factors contributing to longevity and improvement in life quality.

Research studies have shown that physical activity can lead to a decrease in platelet aggregation and a reduction in the risk of cardiovascular disease which in turn may cause a lower rate of mortality (Adampolous et al., 2003).

Theories and definitions

Aerobic exercise

Aerobic exercise is a physical exercise which aims to improve the system of oxygen consumption. "Aerobic" is composed of Greek affixes of aero- (air) and –bios (life) together, they literally mean "living only in the presence of oxygen". In physical education field, the term refers to the consumption of oxygen in body metabolism and the process of producing energy. There are a great number of aerobic exercises that can be performed with moderate intensity and continuously. An aerobic exercise is an activity which takes more than 90 seconds.When engaged in an activity, muscles obtain the required energy for doing the activity through a process in which glucose and fat are converted into energy (Taghian et al., 2006).

Intercellular and vascular adhesion molecules

Adhesion molecules' role is of great importance in directing the movement of the leukocytes and also moving them away from blood flow toward the lymphoid tissues especially the infection and inflammation areas. Adhesion molecules also play an important role in cardiovascular diseases especially atherosclerosis. As the concentration of these molecules increases in an individual's body so does the likelihood of occurrence of the above mentioned diseases (Adampolous et al., 2003).

According to the research studies, CD164 molecules play an important role in adhesion of hematopoietic progenitor cells to bone marrow stromal cells. Many components of the extracellular matrix have interaction with receptors on the surface of hematopoietic cells including: fibronectin, thrombospondin, hyaluronic acid, laminin, and Heparan sulfate. CD44 is the receptor of hyaluronic acid which is expressed on the surface of all leukocytes. The receptor is requirred for premature granulopoiesis and also crossing of mature lymphocytes. Another group of compounds such as chemokines play an important role in regulating and implanting of blood cells (Mogharnasi et al., 2013).

METHOD

The present study sought to examine the effect of aerobic training in an eight-week period on intercellular and vascular adhesion molecules in middle aged women. Therefore, the current research is applied and quasi-experimental.

The demographic features of the subjects are given in Table 4.1.

Table 4.1: The subjects' demographic information (the variables have been reported based on SD± mean

Control group	Aerobic group	Variable
41.30±3.02	47.70±5.35	Age (year)
158.20±6.33	160±6.71	Stature(cm)
59.84±7.38	71.48±13.45	Weight (kg)

The results of the statistical analysis of the variables of the study are presented in Table 4.2. Table 4.2: Changes in glucose levels, insulin, and insulin resistance before and after exercise in the experimental group

Control group	Aerobic exercise group		Variable
9.31±1.51	8.78±2.14	Pre-test	Intercellular adhesion
9.16±2.14	9.38±193	Post-test	molecules Pg/ml
4.54±0.59	4.21±0.7	Pre-test	Vascular adhesion
4.08±0.85	3.89±0.47	Post-test	molecules Pg/ml

In order to determine whether the results of the study are normally distributed in the research groups, we employed Kolmogorov–Smirnov test. The results of the analysis are provided in Table 4.3.

4.3: Results of Kolmogorov–Smirnov test in order to determine the normality of the distribution

Level of significance	Z		Variable
0.89	0.57	Pre-test	Intercellular adhesion
0.81	0.63	Post-test	molecules
0.85	0.60	Pre-test	Vascular adhesion
0.85	0.60	Post-test	molecules

As Table 4.3 illustrates, the distribution of the research variables is normal in the research groups (intercellular adhesion molecule pre-test (P=0.89), intercellular adhesion molecule post-test (P=0.81), vascular adhesion molecules pre-test (P=0.85), vascular adhesion molecules post-test (P= 0.85)).

RESULTS

The results of the data analysis in Table 4.4 illustrates that there is not a meaningful difference between changes in the number of intercellular adhesion molecules in the experimental group and those of the control group (t (18) =0.84, p=0.40). Accordingly, it could be said that the eight-week aerobic activity did not have any special effect on the reduction of the number of intercellular adhesion molecules.

Table 4.4: Intercellular adhesion molecule independent t-test results in experimental and control group

Level of significance	Degree of freedom	T	SD	Mean	Group
0.40	18	0.84	1.69	0.60	Experimental
			2.25	-0.15	Control

According to Table 4-5 there is not a meaningful difference between intercellular adhesion molecule in pre- and post-test in both the experimental group (t (9) =1.12, p= 0.29 and control group (t (9) = -0.21, p= 0.83. Figure 1.1 provides a clearer view of the changes observed.

Table 4.5: T-test results related to changes in cell adhesion molecule pre-and post-tests of aerobic exercise and control groups

Experimental group				Control group		
Level of significance	Degree of freedom	T		T	Degree of freedom	Level of significance
0.29	9	1.12	Pre-test	-0.21	9	0.83
			Post-test			

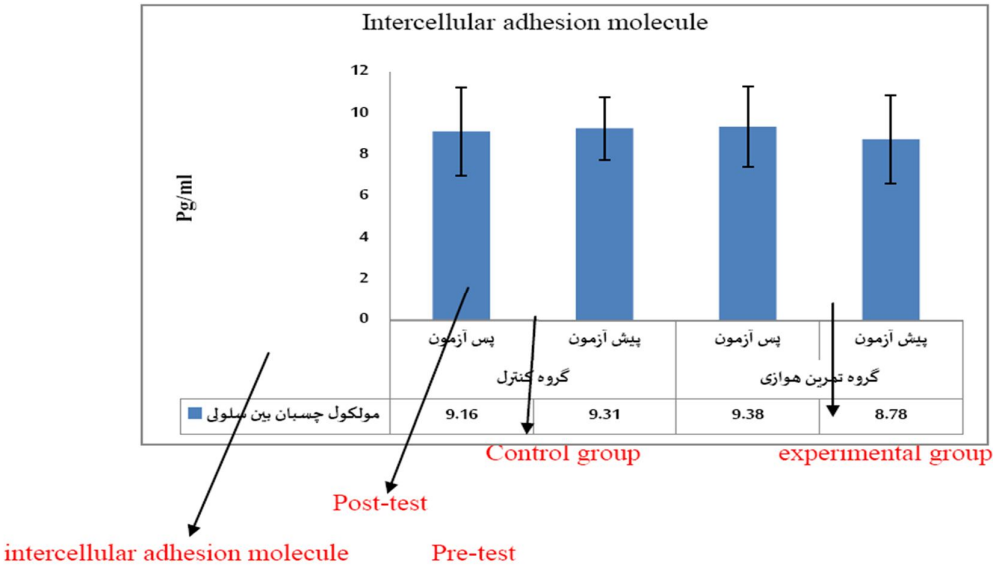

Figure 1.1: Intercellular adhesion molecule changes in the experimental and control group

The results of the data analysis in Table 4.6 indicates that there is not a meaningful difference between changes in the number vascular adhesion molecules in the experimental group and those of the control group (t (18) =0.39, p=0.69). Therefore, it could be said that the eight-week aerobic activity did not have any special effect on the reduction of the number vascular adhesion molecules.

Table 4.6:Vascular adhesion molecules independent t-test results in experimental and control group

Level of significance	Degree of freedom	T	SD	Mean	Group
0.69	18	0.39	0.83	-0.31	Experimental
			0.82	-0.46	Control

According to Table 4-5 there is not a meaningful difference between vascular adhesion molecules in pre- and post-test in both the experimental group (t (9) = -1.19, p= 0.26 and control group (t (9) = -1.78, p= 0.10. Figure 2-4 provides a clearer view of the changes observed.

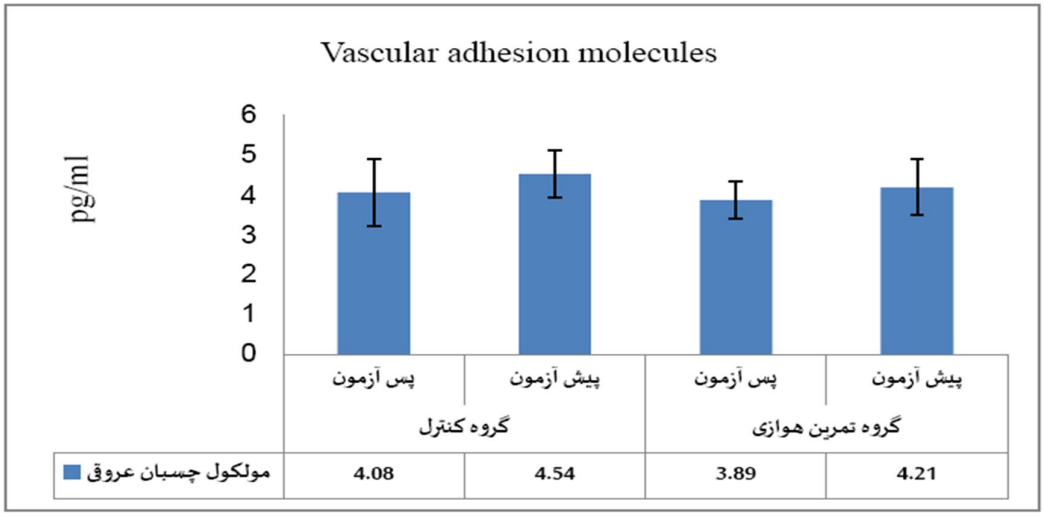

Figure 1.1: Vascular adhesion molecule changes in the experimental and control group

DISCUSSION

The results of the study revealed that a period of eight weeks of aerobic exercise did not have any significant effect on vascular adhesion and intercellular adhesion molecules. Yet a review of the related literature suggests that after 24 sessions of training the number of intercellular adhesion molecules increased though not meaningfully. However, the number of molecules increased meaningfully when the number of training sessions increased to 36 sessions.

CONCLUSION

1-Eight weeks of aerobic exercise with an intensity of 55 to 65 percent of maximum heartbeat do not have a meaningful effect on intercellular adhesion molecules.

2-Eight weeks of aerobic exercise with an intensity of 55 to 65 percent of maximum heartbeat do not have a meaningful effect on vascular adhesion molecules.

REFERENCES

1. Adamopoulos, S., Parissis, J., Kroupis, C., Georgiadis, M., Karatzas, D., &Karavolias, G. (2001). Physical Training Reduces Peripheral Markers of Inflammation in Patients with Chronic Heart Failure. Eur Heart J, 22 (9): 791- 797.
2. Bauer, Jj., & Snow, Cm. (2003). What Is The Prescription For Healthy Ones?. J. Musculoskel, Neuron Interact, 3(4): 352-55.
3. Geraldine, M., Philippe, C, Bezin,L., Julien,T., ET. AL. (2007). Effects OfGoldhammer, E., Tanchilevitch, A., Maor. (2005). "Exercise trainin4.modulates cytokines activity in coronary heart disease patients". Int. J. Cardiol'(100):93-99.
4. Progressive And Maximal Exercise on Plasma Levels of Adhesion Molecules in Athletes with Sickle Cell Trait with or without _Thalassemia. J ApplPhysiol, (102):169-173.
5. Ito, H., Ohshima, A., Inoue, M., (2002). "Weight reduction decreasessoluble cellular adhesion molecules in obese women". ClinExpPharmacolPhsiol(29): 399-404.
6. Jason, M. R., Gill, M J., Caslake, C M., Cris, J., (2003). Effects of short-term detraining on postprandial metabolism, endothelial function, and inflammation in endurance-trained men: dissociation between changes intriglyceride metabolism and endothelial function. J of Clinical Endocrinology & Metabolism, 88(9): 4328-4335.
7. Libby ,P., Bonow, Ro., Mann, Dl., Zipes ,. Dp. Editors. (2007). Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 8th Ed. Philadelphia, Pa: Elsevier Science.
8. Lira, F.S., Yamashita, AS., Uchida, MC., Zanchi, NE., Gualano, B., Martins, E.,(2010). Low and moderate, rather than high intensity strength