

Effect of twelve weeks aerobic training on selected molecules 1 TNF-A, CRP, ICAM-1, VCAM-1 Type 2 diabetes in middle-aged women

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Abstract: Diabetes and obesity are risk factors for cardiovascular disease. Given the importance of this objective the study of the effect of 12 weeks of aerobic training on surface adhesion molecules icam-1, vcam-1 and crp and tnfa in middle-aged women sedentary patients with type 2 diabetes. 24 sedentary obese women with a mean age of 38 years, body mass index, 32 were randomly selected and divided into two groups (n = 12) and group training (12 people). First of both blood in the ground state is collected and then the training groups for 12 weeks of aerobic exercise aerobic intensity of 60 to 75 percent of maximum heart rate per week for three sessions in Zabol did the 48 hours of training in Fasting blood samples were taken and standard kits were used to measure the variables Data using t-test and t-test analysis The results showed that, in addition, where their body mass index fell icam- the 1, vcam-1, crp, tnfa decrease in the exercise group had a statistically significant reduction. In general, the results showed that aerobic activity in the reduction of inflammation and adhesion molecules effective.

Key words: Disabled diabetics; Icam-1; Vcam-1; Crp; Tnf-a

1. Introduction

In this century, the increasing prevalence of obesity, diabetes and related side effects are a major health problem in our country. According to some reports, men and women, respectively, 58% and 75% suffer from overweight and obesity (Azizi, 2003). Furthermore, in 46% of deaths due to heart failure (Crooner resulting lack of exercise, obesity and the complications of diabetes have been reported (Sheinikar, 2006) has been recognized as an important role in the arteriole endothelial wall vascular homeostasis (Vahi, 2007) and its failure as an important indicator of cardiovascular disease (atherosclerosis are very common in type II diabetes (Gibbs, 2012) may be a risk factor in subjects such as hypertension, metabolic syndrome and diabetes is the leading cause of increased biological markers related to endothelial function and hence the likely significant effects on low-impact exercise is (Dehavan, 2010). Diabetes is one of the risk of diseases is a very important In patients with diabetes and cardiovascular mortality is twice as safe as the main cause of these failures caused by cardiovascular disease and biomarkers of inflammation and necrosis factor alpha and interleukin-6 is the 6 (Neo, 2002) Suggested that inflammatory cytokines secreted by adipose tissue effects on insulin resistance in the liver, skeletal muscle, and vascular endothelial tissue and eventually lead to diabetes and cardiovascular disease are (Hue, 2005) that the health and threatening human diseases,

including issues that have occupied the minds of researchers. (Hopper, 2001) However, cardiovascular disease, the leading cause of death in industrialized and developing countries (Hopper, 2001) One of the main problems that the international community's concerns, the provision and maintenance of healthy elderly people. Given the high percentage of young people in the future will be more elderly people, we can say that one of the major issues and challenges in the future, problems related to the aging process. Among the problems of aging, different diseases that cause morbidity and mortality are. Among these diseases, cardiovascular diseases and disorders are especially coronary important. Some inflammatory markers that are predictive of cardiovascular disease include: Fibrinogen, cytokines, CRP and cell adhesion molecules such as vascular adhesion molecules VCAM-1 and integrin 1 ICAM- and s. For this reason, many researchers VCAM - 1 as a new factor of inflammation predict cardiovascular disease, especially .1 ICAM- 1 Atherosclerosis is considered an important role in leukocyte movement and adhesion of endothelial and inflammatory molecules increases gives (Gung and Newman, 1993). ICAM- 1 in plaque formation and activation of endothelial cells and smooth muscle expressed. (Black, 2002) increases the sensitivity of vascular .sdmat Chsyan the molecules. (Adamupus, 2001 and Christian, 2003 and Apt 2007] On the other hand, the factors that are predictive of cardiovascular disease (CVD) in patients with diabetes there is some research physiologic diabetes concentrated, while the role of CRP in predicting the risk of association between CRP and diabetes two types of questions.

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(Dos, 2001) in particular, fat-produced cytokines, such as tumor necrosis factor alpha and interleukin-6 leads to reactive protein is an acute phase response associated with increased hepatic production of acute phase reactive protein, resistance insulin in the liver and skeletal muscle tissue and vascular endothelium in diabetes and cardiovascular disease is. (Davis, 2001), causing inflammation and stimulate the development of insulin resistance and production of endo-epithelial adhesion molecules such as selecting and ICAM-1, VCAM CRP-1 is associated with obesity, insulin resistance and glucose intolerance that leads to insulin resistance and glucose-sectional Studies have shown that CRP levels are associated with obesity and insulin resistance and glucose intolerance are (Veysar, 1999), so researchers are constantly looking for predictors of cardiovascular disease risk in diabetic patients with sensitivity further. Exercise can improve the beneficial effects on inflammatory markers VCAM - 1, bring the inflammatory cells plays an important role in the development of diabetes and .Sport position and (potential effects of exercise include reducing body fat and adipose tissue macrophages and interleukin 6 and tumor necrosis alpha is inhibited (Woods, 2009) The purpose of this study is important is the effect of 12 weeks of aerobic training on CRP, ICAM-1 1 TNF-A, VCAM- in type 2 diabetic patients be monitored to know whether aerobic exercise for 12 weeks had no effect on the level of the group is ?

2. Materials and methods

100 type 2 diabetic patients IN ZABOL with body mass index (BMI) ranging from 32, nonsmokers, free from respiratory, kidney; liver, metabolic and neurological disorders participated in this study. Their age ranged from 38. The subjects were included into 2 equal groups: the first group (A) received aerobic exercise training, while the second group (B) received no aerobic exercise training three times a week for 3 months. Informed consent was obtained from all participants.

All participants were free to withdraw from the study at any time. If any adverse effects had occurred, the experiment would be terminated and the Human Subjects Review Board would be informed. However, no adverse effects occurred, and so the data of all the participants were available for analysis blood sample after fasting for 12 hours was taken from each patient centrifuged and plasma was separated and stored frozen at -20 ° to be used for estimation of leptin, plasma TNF-alpha, C- reactive protein (CRP and ICAM-1, VCAM-1. The aerobic training program was at 60% to 70 % of the maximum heart rate (HRmax) The mean values of TNF-alpha, CRP, obtained before and after 3 months in both groups were compared using paired "t" test. Independent "t" test was used for the comparison between the two groups (P <0.05).

Data analysis:

Table 1: mean value, TNF-ACRP, VCAM-1, ICAM-1 in the exercise group

Variables	Before the test	After the test	Statistics T	Significance level
	Mean + standard error	Mean + standard error		
ICAM-1	2.23 + 255.19	2.45 + 218.46	6.68	0.006
VCAM-1	2.25 + 543.66	2.42 + 528.6	7.2	0.008
CRP	1.2 + 4.6	1.1 + 2.99	4.48	0.002
TNF-alpha	1.26 + 5.78	1.17 + 4.45	6.65	0.007

Table 2: The mean TNF-alpha, CRP, VCAM-1, and ICAM-1 in the control group

Variables	Before the test	After the test	Statistics T	Significance level
	Mean + standard error	Mean + standard error		
ICAM-1	2.45 + 235.89	2.45 + 238.89	5.56	2.0
VCAM-1	2.25 + 509.63	2.42 + 512.1	7.2	0.34
CRP	1.2 + 3.3	1.8 + 3.5	2.3	0.02
TNF-alpha	1.85 + 5.69	1.17 + 5.01	3.2	0.13

3. Conclusion

The results showed that the CRP levels decreased in subjects with results' only after weeks of aerobic training et al. (2010) investigated the effect of exercise on plasma levels of CRP and TNF-alpha dose rat epithelial And o performance of the mice diabetes began to CRP levels in normal and diabetic rats were divided into two groups of diabetic rats compared to controls very high CRP but fell in the second week in week six, reducing the very high compared to the control group was significantly higher than in the second week and the sixth CRP levels of This study

proved that the control group declined to exercise a long-term effect in reducing the CRP is consistent with the results, but Frank and colleagues (2002) concluded that women with diabetes compared with those of healthy subjects, VCAM- 1- 1, CRP VCAM- 1 diabetic women than in normal subjects. Debidhi Roshan et al. (2007) also non-significant in crease in CRP office after four weeks of detraining in the exercise group and the control group were significantly improved. Koli et al. (2008) studied the effect of eight weeks of aerobic exercise on inflammatory markers change in CRP observed in obese children Bergdal (2009) showed that the implementation of the four-week home exercise

rowing ergometer 6 in diabetic men, no significant effect on CRP levels. Not aligned.

The results showed that 12 weeks of aerobic training on the cell surface adhesion molecules and decreases the effect of ICAM-1 Puntruli (2004) year after two minutes of aerobic exercise a significant reduction in the amounts reported ICAM-1 Weight change and their opinions are meaningful relationship with ICAM-1.

Zupuni et al. (2006) after a period of moderate intensity exercise per week for six months in subjects with diabetes significant reduction in the amount of ICAM-1.

Robert et al. (2006) after two weeks of aerobic activity in diabetic patients reported ICAM-1.

Mogharnassi et al. (2007) The effect of regular and continuous exercise training on markers of coronary artery disease in 35 male Westar quarter fell ICAM-1 Check the values that were not significant.

Moradi (2011) the effect of 12 weeks of endurance training on molecular adhesion, cell ICAM-1 and lipid profile in older men concluded that a significant reduction in the amount of ICAM-1 created. Suri (2011) insulin resistance in middle-aged women with diabetes Turn studied put. 24 patients 40 years) participated in this study and were randomly assigned to two - Turn diabetes (age 48) in the experimental group (n = 12) and control group (n = 12) were divided. Fasting blood samples were obtained from all subjects. Aerobic exercise such as running and aerobics exercise program with 60% of maximum heart rate, 3 days per week for 10 weeks. Blood - 80 percent, ICAM-1 after 12 hours of fasting in the ground state and at the end of 48 hours after a 16 percent reduction.

But the results Faranank et al. (2002) concluded that inflammatory markers in women with diabetes compared with those of healthy subjects, VCAM-1-1, CRP VCAM-1 diabetic women than in healthy individuals Bvd.ba Tunis results (2007) In another study, three months, 4 days per week in young diabetic patients in the early phase of an impact on ICAM-1, VCAM-1 did not significantly affect the level of inconsistency observed in some studies may be due to the difference abnormal cells in the onset of diabetes in young adults.

This study showed that eight weeks of aerobic activity in diabetic women reduces the amount VCAM-1 results Hatunik et al. (2007) 60 minutes of aerobic activity on a treadmill for 12 weeks reduced the amount VCAM-1 results Faranank et al. (2002) concluded that inflammatory markers in women with diabetes compared with those of healthy subjects, VCAM-1-1, CRP VCAM-1 diabetic women than in controls.

The results of Tunis (2007) in another study, three months, 4 days per week in young diabetic patients in the early phase of an impact on ICAM-1, VCAM-1 did not significantly affect the level of inconsistency observed in some studies may be abnormal cells due to differences in the onset of diabetes in young adults. Ozona (2009) showed that

the 24-week lifestyle modification pattern in 89 diabetic patients, plasma levels ICAM-1, VCAM-1 remained unchanged.

The study also revealed a decrease in TNF-alpha in diabetic patients with results Salam et al. (2010) The Effect of exercise on plasma levels of CRP and TNF-alpha dose of either epithelial mice became diabetic and diabetic mice divided into two were groups of CRP In diabetic group compared The control group was very high in the second week CRP But fell in the sixth week Reduction compared to the control group had very high levels in the second and sixth week CRP Substantial decrease compared to control group Research has proven that exercise has a long term effect in reducing the CRP is consistent with the results Sabatir et al. (2008)

After 14 weeks of aerobic exercise for 50 minutes (including frequency of two minutes each session 55% heart rate reserve) in 13 women - 75% and 65 - 90 intense aerobic activity

Plasma, safe, no significant change was observed in TNF-A.

Results of this study showed that in women with diabetes and sixteen weeks of aerobic exercise in reducing TNF-A, CRP, ICAM-1, VCAM-1 is effective.

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