



FULL LENGTH ARTICLE

The effects of aerobic exercise on middle-aged male smokers & non-smokers with serum hematologic in Bushehr

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ABSTRACT

The effects of aerobic exercise on middle-aged male smokers & non-smokers with serum hematologic in Bushehr. Chemical of cigarette's tobacco caused to adverse changes in blood & to overcome of it can use activities & since blood same as other organs don't show same response to each activity, the kind of activity, time, intensity & duration of it are situation that body show new reactions. Goal: the goal of current research, comparison & surveying the effects of 6 weeks of aerobic exercises on middle-aged male hematologic indexes. The methods of surveying: the current study in the semi-experiences, so 30 subjects [32-48 years old] are selected randomly & the effects 6 weeks aerobic exercise that included 2 classes that was 45 minutes with 50 intensity to save 65% of heartbeats that surveyed middle-aged male smokers & non-smokers hematologic indexes. For doing the research filled the healthy determination & the amount of smoking questionnaires, then measured their weight & height & blood hematologic indexes to ensure of similarity of experimental groups & align the samples based on indexes before making any changes of independent t—test..before 6 weeks aerobic exercise can see the meaningful decreasing in PLT, HGB, RBC indexes in smokers & it has meaningful effects on HCT indexes & also caused to meaningful decreasing in PLT, HCT & HB indexes in non-smokers & don't have effects on RBC, MCV, MHCH, MCH don't show any meaningful changes in each group & RBC, HCT, HB, MCH, MCHC, MCV mean comparison were not different among smoker & non-smoker groups.

Conclusion: it seems that selected aerobic sport caused to decreasing blood factors in smoker & non-smoker groups

Keywords: aerobic exercise, Cigarette, hematocrit [HCT], white blood cell, red blood cell [RBC], hemoglobin [HGB]

INTRODUCTION

Inactivity is the source of many chronic diseases such as the high blood pressure and heart disease and diabetes and cancer [9].so that the world Health organization specified physical activity as the first indicator of the society s health. Abbasi *et al*, [2011]some inactive individuals make the current trend worse by smoking. Smoking is the main cause of premature death in developed counties every year. Nearly 440 thousand people lose their lives due to smoking in the US. When a person smokes the chemical from tobacco entere the blood stream. Some of this chemical sent messages to the heart that increase heart beats. Smoking also increase plaque [fat accumulation]on the inner walls of the arteries that causes atherosclerotic vascular disease thrombosis sugary [clots in the blood vessels]is another effects of smoking that lead to heart attack [12]on the other hand is a heterogeneous tissue that contains numerous ingredients .these ingredients are influenced by factors inside body and outside environment.

Many observations indicate that blood component change as a result of physical activity .physical activity as a whole increase physical capacity and cause changes in the body such as peripheral blood evrythrocyte system.although significant progress has been made in many fields of hematology and physical exercise but the long term effects of aerobic exercise on blood factors has nearly been examined. This effect is not clear yet and there are many contradictions in how blood tissue change in activity [11]stop smoking without doubt is the best solution to minimize the disease caused by smoking. since

many people fail to quit smoking we need another way to reduce disease related to smoking and exercise may help to reduce these disease.

Bloomer RJ, Fisher-Wellman K, 2009 but there have been little research in this area. so the purpose of this study is to investigate the effect of [8]weeks of aerobic exercise on selected blood factors of inactive smokes and smokers.

Methodology

Society statistics of this research are middle-aged [32-48] smoker and nonsmoker who are non-athletics and living in Bushehr, but the constitution are a group who experience 5 year of smoking and smoke at least 7and 20cigarrete during a day, and the sample include 15 middle-aged smoking man and 15 nonsmoking who were non-athletic, that2 of smoking and 1 of nonsmoking avoid participating in exam. Since the researcher along his goal was faced with barriers such as non-cooperation of people, finding non-athletic smoking people and with regards to nutrition and welfare states of people that were no available, we decided to use experimental method, random selection and by filling a questionnaire including biography and history of their sport and smoking and chose the sample from middle-aged smoking and non-smoking of Bushehr municipalities. Subjects were asked refer to lab, taken their blood sample at 7:30 am and sampling them 1week before aerobic exercise and 1 week after aerobic exercise. At the end of the sampling for more information about hematologic changes following aerobic exercise 10 ml of venous blood from each subject were taken in to the laboratory of Hazrate Zahra of Bushehr and hematocrit [HCT], red blood cell [RBC], hemoglobin[HGB], platelet[PLT], mean hemoglobin corpuscular [MCH] mean corpuscular hemoglobin concentration[MCHC] mean corpuscular volume[MCV]were analyzed. Selections includes 6weeks aerobic exercise with2 sessions in a week with 50%to 65% heart rate severe. Obtained information from measuring of variables were send to computer to analyzed with PC-SPESS statistical software 18 model.

After examining descriptive data ,average record before and after groups was compared separately and then variables in2 group with dependent and non-dependent T-test were compared. Most significant in this study was determined [$p \leq 0/05$]

RESULT AND DISCUSSION

After6 sessions aerobic exercise, significant reduction in the invoices RBC,HGB,PLT of smokers and HGB,PLT,MCH in non-smokers happened. Another factor remained unchanged. Exercise in2 group, smokers and non-smokers had the same effects. As finding of table3 shows to compare the average value of pretest and posttest of smokers t-dependent were used. According to table3 there is a significant differences in the error level of /05 between mean corpuscular hemoglobin and blood platelets $p \leq 0/05$. In other words 6weeks of aerobic exercise in smokers, effectively reduced all three indicators. As table4 shows there is a significant differences between mean hemoglobin and platelet indices before and after exercise[$p \leq 0/05$] .

Avoiding of participation in 6 week program of aerobic exercise reduced the hemoglobin and blood platelets. As table5 shows there is no difference between the variables in 2 group after6 week aerobic exercise. In other words 6week selective aerobic exercise has no significant change between the variables in smokers and non-smokers.

Table 1. Description of the anthropometric characteristics o the subject

height [cm]	mean	variance	Degree of freedom	minimum	maximum
smokers	172.43	4.38	14	164	182
Nonsmokers	173.93	6.02	15	159	182
weight [kg]	mean	variance	Degree of freedom	minimum	maximum
smokers	72.42	1.04	14	57	93
Nonsmokers	77.53	1.18	15	60	97
age	mean	variance	Degree of freedom	minimum	maximum
smokers	42.14	4.28	14	32	48
Nonsmokers	39.53	3.75	15	34	47
Body mass index	mean	variance	Degree of freedom	minimum	maximum
spoken	24 .08	1.3	14	21 .19	2807
Nonsmokers	25 .62	1.8	15	23 .73	29 .28

Table 2.test of erythrocytes hemoglobin, hematocrit, platelet count, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration for the pretest smokers and nonsmokers [independent test]

result	Significant index	variance	Mean	Variables
Without distinction	720.	.6677	5.5917	Smoking group RBC
		7137	5.2369	nonsmoking group RBC
Without distinction	430.	1.1968	16.2167	Smoking group HB
		.9503	14.8154	nonsmoking group HB
Without distinction	181.	9.5871	44.9500	Smoking group HCT
		2.8440	44.1154	nonsmoking group HCT
Without distinction	561.	31.1666	216.0833	Smoking group PLT
		46.7145	236.0769	nonsmoking group PLT
Without distinction	0.244	4.467	86.582	Smoking group MCV
		8.9855	81.8000	nonsmoking group MCV
Without distinction	0.630	1.190	33.529	Smoking group MCHC
		1.2888	33.1615	nonsmoking group MCHC
Without distinction	0.233	2.306	29.0730	Smoking group MCH
		3.0976	28.0231	nonsmoking group MCH

Table 3.test of erythrocytes hemoglobin, hematocrit, platelet count, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration for the pretest and post test smoking[paired test]

Result	Significant lend	Smoking people		Variables
		Post test	Pre test	
Without distinction	0.721	43.5833	44.9500	HCT
Significant reduction	0.01	5.3317	5.5917	RBC
Significant reduction	0.01	15.5000	16.2167	HGB
Significant reduction	0.01	194.9167	216.0833	PLT
Without distinction	0.138	29.749	29.0730	MCH
Without distinction	0.104	32.441	33.529	MCHC
Without distinction	0.058	87.258	86.582	MCV

Table4..test of erythrocytes hemoglobin, hematocrit, platelet count, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration for the pretest and post test nonsmoking[paired test]

result	Significant lend	nonsmoking people		Variables
		Post test	Pre test	
Without distinction	0.721	43.5833	44.9500	HCT
Without distinction	0.14	5.3317	5.5917	RBC
Significant reduction	0.001	15.5000	16.2167	HGB
Significant reduction	0.001	194.9167	216.0833	PLT
Significant reduction	0.001	27.6846	28.0231	MCH
Without distinction	0.526	33.5923	33.1615	MCHC
Without distinction	0.237	83.8231	81.8000	MCV

Table5..Test of erythrocytes hemoglobin, hematocrit, platelet count, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration for the post test smoking and nonsmoking[independent test]

result	Significant index	variance	mean	Variables
Without distinction	0.889	.6801	5.3317	Smoking group RBC
		.7964	5.1962	nonsmoking group RBC
Without distinction	0.358	1.2483	15.5000	Smoking group HB
		1.1169	14.0615	nonsmoking group HB
Without distinction	0.244	10.4568	43.5833	Smoking group HCT
		3.2730	42.7462	nonsmoking group HCT
Without distinction	0.319	27.7995	194.9167	Smoking group PLT
		49.6984	215.5385	nonsmoking group PLT
Without distinction	0.418	4.14214	87.4800	Smoking group MCV
		6.89893	83.8231	nonsmoking group MCV
Without distinction	0.729	2.15481	29.3100	Smoking group MCHC
		2.9520	33.5923	nonsmoking group MCHC
Without distinction	0.338	1.34829	33.4700	Smoking group MCH
		3.0721	27.6846	nonsmoking group MCH

CONCLUSION

Finding of this research showed that 6 weeks of aerobic exercise had significant reduction in erythrocytes, hemoglobin and platelets of smokers, but hematocrit reduction was not significant and hemoglobin platelet in non-smokers reduced significantly but hematocrit and erythrocytes not reduced significantly so selected aerobic exercise reduced blood viscosity.

Since in this study aerobic exercise was done with sub maximal intensity of 50%to 63% heart best vast .the result of this research is compared with other similar researches focus on sub maximal aerobic exercise

So our research is compared with research that was done on nonsmoker because of non-definite result about effect of aerobic exercise on blood indicators of smokers. the results of our research showed that indices HCT and HGB and RBC reduced after exercise. that was along with researches of [8,11, 15, 14] and was not agree with research of rahmanInia[14,6]

This reduction is known as [sport anemia].sport anemia not only by hemolysis but also by oxidative damage to red blood cells arise. in normal circumstances red blood cells with a mean age of 120 days, reconstituted one percent each days. the speed of reconstitution increase in aerobic exercise that is beneficial for athletics. because young red blood cells carry oxygen more efficiently than older red blood cells .on the other hand exercise increases plasma volume but not blood red cells and hemoglobin .[7]

Our research showed that exercise reduce condensation of platelet in smokers and nonsmokers.Researches show that reduction in condensation of platelet reduce cardiovascular disease and ultimately reduce mortality that is agree with the result of [1,16] real state [10] and is inconsistent with ancestor Ghanbari [16]land [8]and Sattari person[17].another finding of the study can be noted is no significant change in indicators of MCH,MCHC,MCV smokers MCHC,MCV.that is the result of non- match of blood group.

MCH decreased in smokers because this index is obtained by dividing the hemoglobin of red blood cells. Although hemoglobin of non-smokers reduced significantly but the red blood cells not reduced. This2 factors reduced significantly in smokers and MCH remained unchanged .

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