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The effects of aerobic exercise on some pulmonary indexes, body composition, body fat distribution and VO2max in normal and fat men of personal and members of faculty of Azad university Bebahan branch

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Abstract

The purpose of this study was the effects of aerobic exercise on some pulmonary indexes, body composition, body fat distribution and VO2max in normal and fat men of personal and members of faculty of Azad university Bebahan branch. There are several reports on the association between body mass index (BMI) and pulmonary indexes. Body fat distribution and overweight may have negative impacts on the pulmonary system that's because those with overweight are generally inactive and are with decreased working potential for them, the amount of energy they need for daily activities is consumed by energizing the respiratory organs due to the depression in the pulmonary operation and weakness of respiratory organs. The method of this study was semi-experimental. Study's approach was of pre-tested and post-tested with the control group. Statistical sample of this research, includes 200 of male masters and personnel of Behbahan Azad University with average between 35 to 45 ages. In this study, the examinees were categorized by simple random selection into experimental groups of less than -25, and more than 25 BMI. Before the exercises aerobics we took pre-test and post-tested of pulmonary indices (FEV1, FVC), body mass index, body fat distribution and VO2max from each group, and obtained data are analyzed by variance analysis, in the meantime the level of significance in this research is $\alpha \leq 0.05$, and analyzing of data is done by spss software. The result of this study has shown that aerobic exercise has affected on pulmonary indices, BMI, VO2max and body fat distribution in fat and normal groups and there were significant differences between these groups and control groups $P \leq 0.05$. There are many studies have shown the effect of aerobic training on pulmonary indices, BMI, VO2max. We can see a positive significant associated between VO2max and pulmonary indices and a negative significant associated between pulmonary indices and BMI, body fat distribution with increase in once caused decrease in another.

Keywords body mass index (BMI), pulmonary indexes, Body fat distribution

1. Introduction

Aerobic exercise and fitness can be contrasted with an aerobic exercise, of which strength training and short-time running are the most salient examples. The two types of exercise differ by the duration and intensity of muscular contractions involved, as well as by how energy is generated within the muscle. Aerobic exercise comprises innumerable forms. In general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, on the other hand the ability to use oxygen which can be expressed as ml kg per minute, in the area of exercise physiology is an index of oxygen

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uptake power, or in other words, its is defined as the maximum ceiling picked up oxygen as oxygen consumption or oxygen uptake power. And aerobic fitness level can be showed with a numerical index Resistance to airflow is the most common major cause of respiratory failure(Vylmor,2000). Severe airway obstruction may have some risks and can be occur in any part of the respiratory ways. From Obstruction of the smallest airways, larynx and pharynx to obstruction by external factors. Maximum resistance to airflow does not happen in the small airways, but arise in some large bronchial near the trachea (Babb,2003). Reason of this high resistance is that the great number of bronchioles compared to 6500 parallel bronchioles at the end, that each of them must only pass a slight amount of air through, is so little(Toni,J,2002). Impaired lung function—in particular, low forced expiratory volume in 1 s (FEV1)—is associated with increased morbidity and mortality (7, 8), and it is well recognized that severe clinical obesity is associated with impairment of lung function (9, 10). Most population studies that examined the relation between obesity and lung function used body mass index (BMI) as a measure of overall adiposity, and nonsignificant or weak associations have been reported, with diminished lung function at both extremes of the BMI distribution (ie, thin or obese) (11, 12). However, BMI does not take into account the pattern of fat distribution or body composition and cannot adequately distinguish between fat mass (FM) and fat-free (ie, lean) mass (FFM). In the past few years, it was suggested that these factors may have distinct effects on pulmonary function (11–15). Several studies reported inverse associations between lung function and measures of central adiposity such as the waist circumference (WC) and the waist-to-hip ratio (WHR) (12, 13, 15–16). In the few reports that investigated the association between the individual components of body composition (ie, FM and FFM) and lung function, FM was shown to be inversely related to lung function but positively related to FFM (6–15). It is well established that, with advancing age, lung function declines (17), and there is a tendency for visceral fat to increase and muscle mass to decline (18). However, only a few studies have considered the associations between body-fat distribution, body composition, and lung function in the elderly (13,14). The aim of the current study was to examine the relation between BMI, central fat distribution (ie, WC and WHR), and body composition [i.e., percentage body fat (%BF), FM, and FFM] and the lung function in a large population study of elderly men who were free of cardiovascular disease (CVD), diabetes, and cancer.

2. Methods

The method of this study was semi–experimental. Statistical sample of this research, includes 200 of male masters and personnel of Behbahan Azad University with average between 35 to 45 ages. Study’s approach was of pre-tested with the control group. the examiners were classified to experimental group in which participated in aerobics exercising and then on base of body mass index classified (20-25, and more than 25 BMI) and we selected a group as control to comparison the effect of aerobics training on experimental group. and they took training 8 weeks, we took pre-test and post-tested of pulmonary indices (FEV1, FVC), body mass index, body fat distribution and VO2max from each group. In this study, the examiners were categorized by simple random selection into experimental groups of (between 20-25, and more than 25 BMI), in the meantime the level of significance in this research is α ≤ 0/05, and analyzing of data is done by spss software. The magnitude of the pre- and post training changes in the two study groups was compared through the use of a one-way analysis of variance (ANOVA) (group, training effect), with repeated measures for the second factor (training effect). A value of p < 0.05 was considered statistically significant.

The 8-wk training program included a period of aerobic training that was supplemented with a 45-min period of relaxation and breathing exercises for the AERO group. the breathing exercises During the training sessions, objects were closely supervised by a trainer. The aerobic training consisted of run on the treadmill for 30 min in each of three weekly sessions. We aimed at high-intensity training, and the work rate corresponding to 70% of the peak work rate achieved during the baseline incremental exercise test was selected as the target training intensity.

3. Results

The overall result of this study has shown that aerobic exercise could be effect on these indices in different groups, this study has shown that the effect of aerobic exercise on fat group and found that this training caused increase in VO2max and pulmonary indices and also decrease in BMI and body fat distribution.
In the table 1 the subjects have shown that in fat group, significant difference between the pre-test and post-test was found. The aerobic exercise has positively significant associated with VO2MAX and pulmonary indices and it has negatively significant associated with BMI and body fat distribution. Additionally we can see the difference between the means of pre-test and post-test in table 1 and chart 1.

In the table 2 the subjects have shown that in normal group, significant difference between the pre-test and post-test was found. The aerobic exercise has positively significant associated with VO2MAX and pulmonary indices and it has negatively significant associated with BMI and body fat distribution. Additionally we can see the difference between the means of pre-test and post-test in table 2.
negatively significant associated with BMI and body fat distribution. Additionally we can see the difference between the means of pre-test and post-test in table 2 and chart 1.

### 3. Discussion and Conclusion

so many research about the quality indices of pulmonary exercise has been done. Some studies have shown that indices of lung after eight weeks of aerobic exercise improved upper road respiratory (Khosravi, 1998) (Alejandro, 2001) (Andrew, L, 2000) (Babb, T. G, 2003). But what is important for the athlete is the maximum oxygen that he can use over a minute per kilogram of body weight. In such studies the relationship between indicators of lung with maximum oxygen consumption have pointed slightly. If the body's ability to get and deliver oxygen to the muscles be more the body can do more exercise and physical activity before reaching the fatigue (Alejandro, 2001) (Toni, J, 2002). However, there is conflicting results about its effects on indices of pulmonary and aerobic exercise performance. So that Toni showed a significant relationship between strong expiratory volume in first second and aerobic power and pain also expressed that persons with lower percentage of their aerobic power are greatly reduced (Toni, J, 2002) (Antonio, B, 1996) (Babb, T. G, B, 2003). Overall results showed that increasing the maximum oxygen uptake in middle-aged people, pulmonary index (FVC, FEV1, FEV1/FVC) also increase which indicates decrease airway obstructive by increasing maximum oxygen uptake. The results of this research in harmony with before studies that suggested that aerobic exercise cause increase in pulmonary indices (FVC, FEV1), VO2MAX and decrease in BMI body fat distribution in two groeps and it shown that with decrease in body fat it cause decrease in VO2MAX and effect on FVC, FEV1. On base result of previous studies and this one we can say that aerobic exercise one of the best training in which affect on pulmonary indices and body fat distribution.

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