Research Paper Physical Education

Different Intensity of Aerobic Exercise on Total Cholesterol of Untrained College Men

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ABSTRACT

Inactivity may be a for more significant factor in the development of overweight and obesity than over eating. Thus exercise must be recognized as an essential component in any program of weight reduction or control. Physical training can substantially alter body composition. Many people have believed that physical activity has only a limited influence on changing body composition and that even vigorous exercise burns too few calories to lead to substantial body fact reduction. The present investigation was conducted to explore the different intensity of aerobic exercise (high, medium and low) on total cholesterol level of untrained college men. To achieve these purpose sixty (N = 60) male untrained UG Engineering students were selected randomly from RMK College of Engineering and Technology, Chennai, India. There age ranged from 19 to 21 years. The subjects were randomly dividied into four equal groups (n=15). All the experimental groups were underwent aerobic (walking, jogging and running) exercise for a period of 45 to 60 min/day/ 4days/w for 15 weeks, it includes warming up and cooling-down exercise. Group I – high intensity (HR125-150/min-RLI of VO2 max 51 to 75%), Group – II medium intensity (HR100-125/min-RLI of VO2 max 25-50%), Group – III low intensity (HR<100/min-RLI of VO¬2¬ max <25%) aerobic exercises respectively and Group – IV control did not participate in any special training [7]. Data were collected on total cholesterol (TC) by enzymatic calorimetric method – Model RA-50 [8] before and after the intervention programme. Dependent 't' test was used to findout the difference between pre and post data. ANCOVA was employed to findout the adjusted post test means differences and Scheffe's post hoc test was also used to know the mean difference ($p < 0.05$). From the results and limitations of this research it was concluded that, fifteen weeks of aerobic exercise reduce the TC level of untrained college men. However, among the intervention, medium and low intensity of aerobic exercise are much effective method to reduce TC level.

KEYWORDS | Aerobic, Intensity, Total cholesterol.

Introduction

Everybody desires a long and healthy life and exercise has a great part of play in this. In one aspect the body can be said to commence ageing from the moment it is born, although it is usual to say it really begins in about the mid-thirties. Regular physical exercise is an important component in the prevention of some diseases [1].

Sedentary lifestyle has been associated with an increased risk for two major metabolic and endocrine disorders: obesity and diabetes. Fitness can be conceived as the matching of the individual to his or her physical and social environment. Life styles affect people's health, with eating habits and regular physical activity being the two influential factors [2] irrespective of sex, age or country of residence [3].

Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health. It is performed for many different reasons. This include strengthening muscles and the cardiovascular system, weight loss or maintenance and for enjoyment [4].

The exercise produces biochemical changes in the cardiorespiratory system and other important alteration in body composition such as HDL, LDL, TC, protein, blood glucose and TG levels [5]. High blood cholesterol is one of the major risk factors for heart disease. In fact, the higher the blood cholesterol level, the greater the risk of developing heart disease or having a heart attack.

High blood cholesterol itself does not cause symptoms, so many people are unaware that their cholesterol level is too high. It is important to findout what one's cholesterol numbers are because lowering cholesterol levels that are too high lessens the risk for developing heart disease and reduces the change of a heart attack or dying of heart disease, even if one already have it. Cholesterol lowering is important for everyone-younger, middle age and older adults; women and men; and people with or without heart disease [5].

Any physical training (activity) leads to anatomical, physical, physiological, biochemical and psychological changes. The efficiency of physical activity results from its duration and repetitions (volume), load and velocity (intensity) and the frequency of performance (density). Hence the present investigation was conducted to explore the different intensity of aerobic exercise (high, medium and low) on total cholesterol level of untrained college men.

Methodology

To achieve these purpose sixty (N = 60) male untrained UG Engineering students were selected randomly from RMK College of Engineering and Technology, Chennai, India. There age ranged from 19 to 21 years. The subjects were randomly dividied into four equal groups (n=15). All the experimental groups were underwent aerobic (walking, jogging and running) exercise for a period of 45 to 60 min/day/ 4days/w for 15 weeks, it includes warming up and cooling-down exercise. Group I – high intensity (HR125-150/min-RLI of VO_2 max 51 to 75%), Group – II medium intensity (HR100-125/min-RLI of VO_2 max 25-50%), Group – III low intensity (HR<100/min-RLI of VO_2 max <25%) aerobic exercises respectively and Group – IV control did not participate in any special training [7]. Data were collected on total cholesterol (TC) by enzymatic calorimetric method – Model RA-50 [8] before and after the intervention programme. Dependent 't' test was used to findout the difference between pre and post data. ANCOVA was employed to findout the adjusted post test means differences and Scheffe's post hoc test was also used to know the mean difference ($p < 0.05$).

Results

Table I. ANCOVA and 't' test Experimental and Control Groups on Total Cholesterol (mg/dl)

Group	Adjusted post test mean	't' value	% improvement	'F' value
High intensity	181.3	6.28*	1.61	11.49*
Medium intensity	178.8	20.19*	3.06	
Low intensity	178.3	5.60*	2.99	
Control	182.2	0.98	0.81	

't' table value 2.13 and F table value 2.78 respectively; *p > 0.05

Table II. Scheffe's post hoc Test on Total Cholesterol

High	Medium	Low	Control	MD	CI
181.3	178.8	–	–	2.5*	2.21
181.3	–	178.3	–	3.0*	
181.3	–	–	182.2	0.9	
–	178.8	178.3	–	0.5	
–	178.8	–	182.2	3.4*	
–	–	178.3	182.2	3.9*	

From the results it was clear that, different intensity of aerobic exercise reduced total cholesterol (TC) level of untrained college men. However the high intensity and control group did not have much changes on TC. The results of post hoc test reveals, medium and low intensity aerobic exercise reduce TC level equally. The magnitude reduction is also shows the same.

Discussion

Most of the studies have used aerobic training, several other studies have now used resistance training and have shown impressive decreases in body fat and increase in fat-free mass. The evidence shows that exercise is an important part of any weight loss and lipoprofile control program. The result of the present investigation shows that high, medium and low intensity aerobic exercise reduces the TC level of the untrained college men. However the result of post hoc test reveals that, low and medium intensity aerobic exercise are more effective method to reduce TC level of untrained college men.

Running can reduce the amount of fat in the body. According to the National federation of personal trainers endurance specialist manual, 65% to 95% of the calories burnt during aerobic exercise such as running comes from the body's fat stores. The exact proportion is, fat calories that burn depends on aerobic condition and the intensity of the activity [9]. Regularly performed aerobic exercise, such as walking jogging, cycling and swimming have positive impact in lipids, lipoprotein and prostaglandin profiles. Anaerobic exercise, however, does not influence at the same rate. Regular physical activity also prevent CHD and decreases the symptoms in subjects with CVD [10]. The effect of exercise on blood lipid, TC and cholesterol fractions (HDL & LDL) has taken the attention of many researchers. In the present investigation, the results indicates that high intensity of aerobic exercise has less effect on the reduction of TC but low and medium intensity aerobic exercise have more impact on the reduction of TC of untrained college men.

The meta analysis on aerobic exercise recommended that lipids, lipoproteins and TC [11] aerobic exercise lowers the LDL-C and TC in adults with type-2 diabetes [12]. Short period of high-intensity interval aerobic training lowers the rate of VLDL-TG secretion by the liver in previously sedentary men [13]. Aerobic and combined training showed significant and similar decreases in blood LDL-C concentrations, a larger dose of aerobic exercise does not necessarily equate to a greater improvement in LDL-C concentrations if the lost aerobic exercise time in replaced with resistance exercise [14]. Moderate intensity combined training included aerobic dance, step exercise and resistance training have positive effect on some serum lipid profiles and body fat percentage in sedentary females [15]. Eight week step aerobic exercise decrease the fat percentage, increase back muscle strength, maximal O_2 uptake, relieve fatigue and finally boost vitality as well [16].

High and moderate intensity of aerobic exercise are the best method to increase VO_2 max of CAD patients. As VO_2 peak seems to reflect a continuum between health and cardiovascular disease and death [17]. The present result may be useful in designing effective training/therapy programmes for improved health in future. Endurance training had significant decreases in body fat, the percentage of fat at the trunk and the abdominal region [18]. Few studies have examined the effect of different training regimens on serum lipid changes in normal-weight participants with healthy lipid profile. Weight loss has been associated with variable changes in lipid profile in obese individuals [19]. High intensity and medium intensity have the similar effect on TC of untrained women [20]. The results of present study on TC for high, medium and low intensity of aerobic exercise were statistically similar.

Conclusion

From the results and limitations of this research it was concluded that, fifteen weeks of aerobic exercise reduce the TC level of untrained college men. However, among the intervention, medium and low intensity of aerobic exercise are much effective method to reduce TC level.

Implication

Medium and low intensity aerobic exercise may be given to reduce the total cholesterol level of untrained college men.

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