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Effects of long-term low intensity aerobic training and detraining on triglycerides in men and women students

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Abstract

The experimental design used for this study was similar to a random group design. It consisted of two different populations namely men and women students. Fifteen men subjects and fifteen women subjects were selected randomly from the above population. All the two experimental groups underwent low intensity aerobic training and were tested prior to and immediately after the experimentation on triglycerides. To find out the detraining effect the blood samples were collected and tested on serum lipids and lipoprotein once in a week (Five Times) after the regular low intensity aerobic training for 16 weeks.

The data collected from experimental group I and group II prior to and after the completion of the training period were statistically analysed for significant difference if any, by applying dependent 't' test. To eliminate the influence of pretest, the net mean gains of experimental groups were computed separately. The paired mean gains of experimental groups were tested for significance by applying independent 't' ratio.

Repeated measures of ANOVA were used to find out the detraining effect of group I and group II. Whenever the 'F' ratio was found to be significant, Scheffé's test was used as post-hoc test to determine which of the paired means differed significantly. The level of confidence was fixed at 0.05 levels, as number of subject were limited and selected variable might have some fluctuation due to extraneous factors as mentioned in the limitations.

The low intensity aerobic training decreased the triglycerides of men group and women group.

The results of the study indicate that the five weeks of detraining programme, (after the 16 weeks' low intensity aerobic training) increase the triglycerides level among the men and women groups.

Keywords: aerobic training, triglycerides

Introduction

In this competitive world, many people find it hard to dedicate time for physical activities like exercises, although one of their first priorities is to stay in perfect shape. Most of them told about the importance of aerobics in our daily lives. Without a doubt, aerobics are particularly helpful for weight control. Research consistently shows that regular physical activity, combined with healthy eating habits, is the most efficient and healthful way to control one's weight. Whether one is trying to lose weight or maintain it, one should understand the important role of physical activity and include it in one's lifestyle. Physical activity helps to control one's weight by using excess calories that otherwise would be stored as fat. The number of calories one eats and use each day regulates one's body weight. Everything one eats contains calories, and everything one does uses calories, including sleeping, breathing, and digesting food. Any physical activity in addition to what one normally does will use extra calories.

A good aerobic exercise program can help one live a longer, healthier life and enhance one's wellbeing. One get a multitude of benefits if one do one's aerobic workout on a regular basis even if the intensity is low or short in duration. It's fun to keep a log of one's workouts that track one's progress to see how far one have come in one's pursuit of fitness. Aerobic exercise is any extended activity that makes one breathe hard while using the large muscle groups at a regular, even pace. Aerobic activities help make one's heart stronger and more efficient. During the early part of exercise, one's body uses stored carbohydrate and circulating fatty acids (the building blocks of fat molecules) for energy.

Exercise means excessive use of body muscles for a specific time regularly. There are different types of exercises. Exercise is very important for health and fitness. It has multiple beneficial effects on our body. Exercise increases parasympathetic activity with a minor decrease in sympathetic activity so resting heart rate decreases.

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There is more time for filling ventricles with blood and for delivery of oxygen and nutrients to the body and heart muscles. Exercise reduces blood level of norepinephrine and sympathetic activity which decreases vasoconstriction of arterioles to decrease blood pressure. In exercising individuals body uses fat more efficiently for the same sub maximal task due to increased mitochondrial activity. Exercise boosts the immune system by increasing the levels of interleukin and interferon so less chances of infection are there. Bone density is more in exercising people due to overactive osteoblastic activity. Exercise decreases stress, anxiety, depression, etc. by increasing oxygen supply to brain tissue and by increasing dopamine, serotonin, norepinephrine and acetylcholine. Most important effect of exercise on human body is on metabolic system specially lipids. Lipid and lipoprotein are risk factors for coronary heart disease. (Sinderman, Pedersen and Kjekshus, 1997).

Analysis of data

The analysis of the data collected with regard to the study is presented in this chapter. In this study, the effect of long term low intensity aerobic training and detraining on serum lipids. To achieve this purpose two groups (n = 15) each underwent low intensity aerobic training programmes for 16 weeks and detraining for 5 weeks. The groups were drawn at random from the different population. Subjects of the two groups (men and women) were tested on selected criterion variables serum lipids and lipoprotein prior to and after the 16 weeks of training period. To find out the detraining effect, once in a week (Five Times) the blood samples were collected from the participants and tested on serum lipids

To eliminate the influence of pretest, the net mean gains of experimental groups were computed separately. The paired mean gains of experimental groups were tested for significance by applying independent ‘t’ ratio. A (2 X 5) repeated measure of ANOVA was used to find out the detraining effect of group I and group II. When ever the F ratio was found to be significant the Scheffe’s post hoc test to determine which of the paired means differed significantly. The level of significance was fixed at 0.05 level of confidence for all the cases.

Analysis of data

The effect of independent variables on selected dependent variable was determined through the collected data by using appropriate statistical techniques and results are presented below.

Table 1: mean, standard deviation and ‘t’ ratio on Triglycerides for PRE-AND post test LOW INTENSITY aerobic training of men and female

Groups		Mean	S.D	DM	‘t’-ratio
Men group	Pre-test	120.55	8.63	15.35	8.218*
	Post-test	105.2	10.49		
Women group	Pre-test	125.35	6.30	9.92	8.345*
	Post-test	115.43	8.07		

*Significant at 0.05 level

The table value required for significant for df 14 is 2.14.

Table 1 shows the mean value of triglycerides of men group before the commencement of aerobic training was 120.55 and after the completion of 16 weeks aerobic training the mean was 105.2. It resulted with a mean difference of 15.35. The obtained ‘t’ ratio was 8.218 and it was higher than the table value of 2.14 required for significance at 0.05 level for df 14.

It was concluded that the low intensity aerobic training decreased the triglycerides of men group.

The pre test mean value of triglycerides of women group was 125.35 and the post test triglycerides was 115.43. The mean difference was 9.92. The obtained ‘t’ ratio was 8.345 and it is higher than the table value 2.14 required for significance at 0.05 level for df 14. It was inferred that the low intensity aerobic training had caused significant reduction on triglycerides for the women group.

Table 2: Comparison of mean gain on Triglycerides between paired means between men and female

Groups	Mean	S.D	SE	t-ratio
Men	15.35	7.23	1.87	2.454*
Female	9.92	4.60	1.19	

*Significant at 0.05 level

The table value required for significance for df 28 is 2.05

Table 2 shows the mean gain for men and women groups as a result of low intensity aerobic training were 15.35 and 9.92 respectively. It resulted with a ‘t’ ratio of 2.454 and it was higher than the table value of 2.05 required for significant at 0.05 level to the df 28. It is concluded that decrease in triglycerides was significantly higher for men than women.

Therefore, the results of the study indicate that low intensity aerobic training decrease triglycerides for all the two groups namely men and women groups. It also indicated that the decrease level was greater in men than women group.

The analysis of variance for 2x5 repeated measures on the last factor on triglycerides of different experimental groups of men and women data have been analyzed and presented in table VII.

Table 3: Summary of anova for 2 x 5 repeated measures on the last factor of triglycerides

Source of Variation	SS	df	MS	F
A (Gender)	2174.977	1	2174.977	30.15*
B (Times)	3164.663	4	791.1658	10.97*
AB (Gender X Times)	122.353	4	30.58825	0.42
WSS (Error)	10099.93	140	72.14236	
Total	15561.92	149		

*Table value required for significance at 0.05 level with df 1, 140 & 4, 140 were 3.92 and 2.44

The table 3 shows that the F-ratios for gender and times were 30.15 and 10.97 against 3.92 and 2.44 (df 1, 140 & 4, 140) respectively which were significant at 0.05 level on triglycerides. However, the F- ratio for interaction of gender and times was 0.42 a not significant at 0.05 level.

Since gender has only two categories, it can be directly implied that at detraining, the men groups (mean = 113.06) was lower than the women group (mean = 120.67) in triglycerides.

Since the participants (men and women) have been tested on triglycerides once in a week for the five times, the first week to fifth week test scores of men and women were (mean scores of men =106.63, 108.03, 112.23, 117.45 and 120.95 mean scores of women = 116.21, 117.49, 120.25, 122.78 and 126.64) was gradually increase the triglycerides level. Besides, fifth week serum triglycerides level was almost similar to the pre test score of men and women were (mean = 120.55 and 125.35).

The mean gain value on triglycerides of men and women groups are graphically represented in Figure 1.

The pre test, post-test and detraining test (five times) mean values of men on triglycerides are graphically presented in figure 2.

The pre test, post-test and detraining test (five times) mean values of women on triglycerides are graphically presented in figure 3.

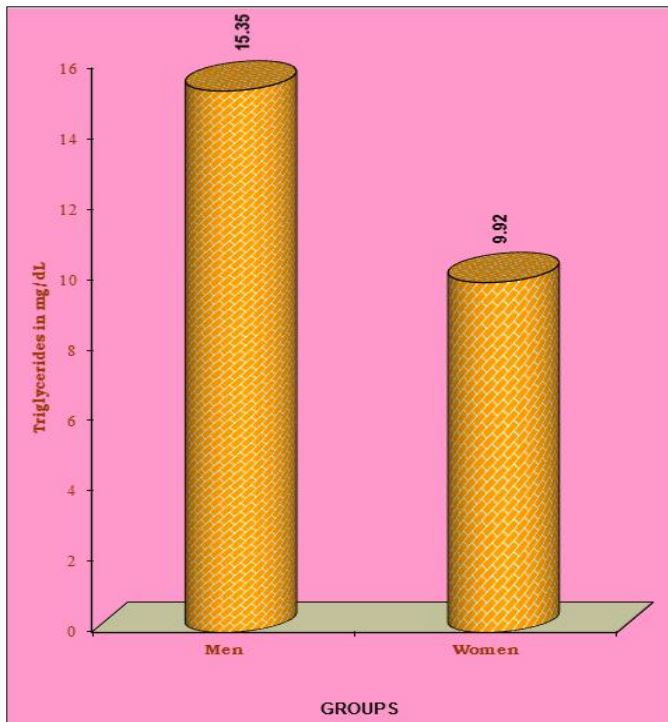


Fig 1: The mean gain value on TRIGLYCERIDES of men and women groups

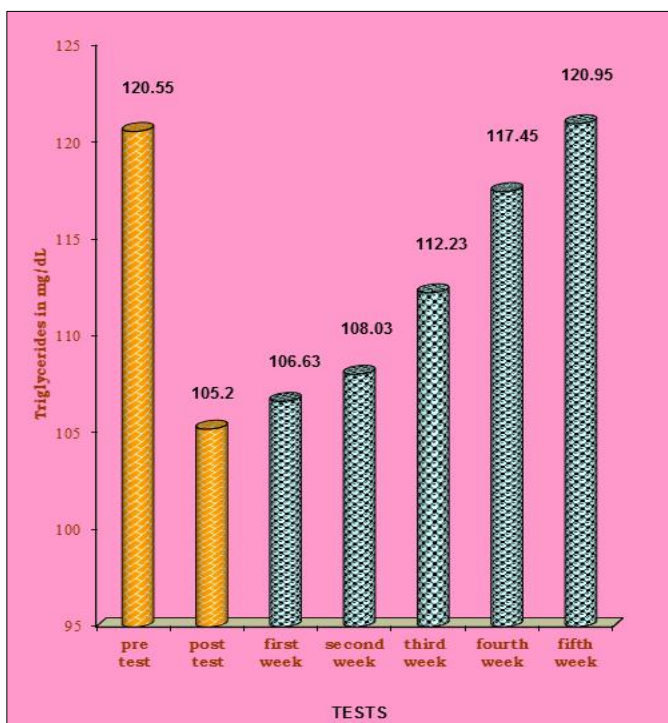


Fig 2: The mean scores of pre, post and detraining test values on TRIGLYCERIDES of men group

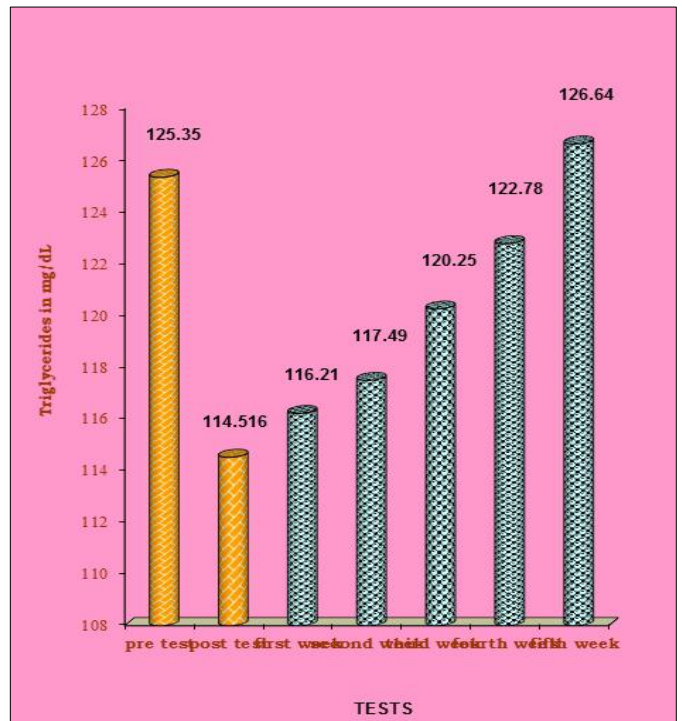


Fig 3: The mean scores of pre, post and detraining test values on TRIGLYCERIDES of women group

Discussion

The low intensity aerobic training decreased the triglycerides of men group and women group Leon and Sanchez, (2001) [13] concluded that aerobic exercises appeared to decrease the TC and LDL increases the HDL in men and women. Scheers, *et al.*, (2008) [14], confirm that nine consecutive months of training on blood lipids in untrained adults.

Conclusion

The low intensity aerobic training decreased the triglycerides of men group and women group. The results of the study indicate that the five weeks of detraining programme, (after the 16 weeks' low intensity aerobic training) increase the triglycerides level among the men and women groups.

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