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PHYSICAL EDUCATION

EFFECTS OF LONG-TERM LOW INTENSITY AEROBIC TRAINING AND DETRAINING ON LOW DENSITY LIPO PROTEIN 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 serum lipids and lipoprotein. To find out the detraining effect the blood samples were collected and tested onhigh density lipoprotein once in a week (Five Times) after the regular low intensity aerobic training for16 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, Scheffe'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.the results of the study indicate that low intensity aerobic training increase high density lipoprotein for all the two groups namely men and women groups. It also indicated that the increase for men was greater than women group. Both men and women group showed significant increase in high density lipoprotein but It is concluded that increase in high density lipoprotein was significantly higher for men than women group. The results of the study indicate that the five weeks of detraining progamme, (after the 16 weeks' low intensity aerobic training) decrease the HDL-C level among the men and women groups.

Keywords: Aerobic Training, LDL, Women.

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. 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 interleukin1and 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 high density lipoprotein. 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 high density lipoprotein. 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. Whenever 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.

LOW-DENSITY LIPOPROTEIN

The mean, standard deviation and dependent 't' ratio on the data obtained for low density lipoproteinof pre and post-test of men and women groups have been presented in Table I.

TABLE – I
MEAN, STANDARD DEVIATION AND 't' RATIO ON LOW-DENSITY LIPOPROTEIN FOR PRE AND POST TEST LOW INTENSITY AEROBIC TRAINING OF MEN AND FEMALE

Groups		Mean	S.D	DM	't'-ratio
Men group	Pre-test	123.35	5.91	4.73	11.589*
	Post-test	118.62	5.39		
Women group	Pre-test	129.81	3.82	3.39	8.817*
	Post-test	126.42	3.24		

*Significant at 0.05 level
The table value required for significant for df 14 is 2.14.

Table I shows the mean value of low density lipoprotein of men group before the commencement of aerobic training was 123.35 and after the completion of 16 week aerobic training the mean was 118.62. It resulted with a mean difference of 4.73. The obtained 't' ratio was 11.589 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 low density lipoprotein of men group. The pre test mean value of low density lipoproteinof women group was 129.81 and the post test low density lipoprotein was 126.42. The mean difference was 3.39. The obtained 't' ratio was 8.817 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 low density lipoproteinfor the women group.

TABLE II
COMPARISON OF MEAN GAIN ON LOW-DENSITY LIPOPROTEIN BETWEEN PAIRED MEANS BETWEEN MEN AND FEMALE

Groups	Mean	S.D	SE	t-ratio
Men	4.73	1.58	0.41	2.38*
Female	3.39	1.49	0.38	

*Significant at 0.05 level
The table value required for significance for df 28 is 2.05

Table II shows the mean gain for men and women groups as a result of low intensity aerobic training were 4.73 and 3.39 respectively. It resulted with a 't' ratio of 2.38 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 low density lipoprotein was significantly higher for men than women group. Therefore the results of the study indicate that low intensity aerobic training decrease low density lipoprotein for all the two groups namely men and women group. It also indicated that the decrease for men was greater than women group. The analysis of variance for 2×5 repeated measures on the last factor on LDL-C of different experimental groups of men and women data have been analysed and presented in table III.

TABLE - III
SUMMARY OF ANOVA FOR 2 X 5 REPEATED MEASURES ON THE LAST FACTOR OF LDL-C

Source of Variation	SS	df	MS	F
A (Gender)	2082.536	1	2082.536	48.88*
B (Times)	435.5937	4	108.8984	2.56*
AB (Gender X Times)	41.92788	4	10.48197	0.25
WSS (Error)	5964.827	140	42.60591	
Total	8524.885	149		

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

The table III shows that the F-ratios for gender and times were 48.88 and 2.56 against 3.92 and 2.44 (df 1, 140 & 4, 140) respectively which were significant at 0.05 level on LDL-C. However, the F- ratio for interaction of gender and times was 0.25 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 = 121.13) was lower than the women group (mean = 128.46) in LDL-C. Since the participants (men and women) have been tested on LDL-C 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 =118.7, 119.244, 120.787, 122.170 and 124.748 mean scores of women = 127.07, 127.07, 128.167, 129.353 and 130.207) was gradually decrease the LDL-C level. Besides, fifth week serum LDL-C level was almost similar to the pre test score of men and women were (mean = 123.34 and 129.81).Therefore the results of the study indicate that the five weeks of detraining progamme, (after the 16 weeks low intensity aerobic training) decrease the LDL-C level among the men and women groups. The mean gain values on low density lipoprotein of men and women groups are graphically represented in Figure-I. The pre test, post-test and detraining test (five times) mean values of men on LDL-C are graphically presented in figure II. The pre test, post-test and detraining test (five times) mean values of women on LDL-C are graphically presented in figure III.

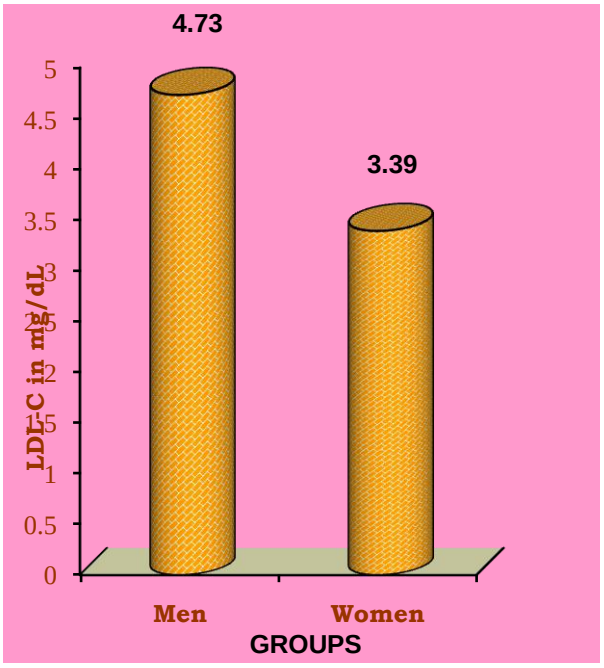

FIGURE I
THE MEAN GAIN VALUE ON LDL-COF MEN AND WOMEN GROUPS

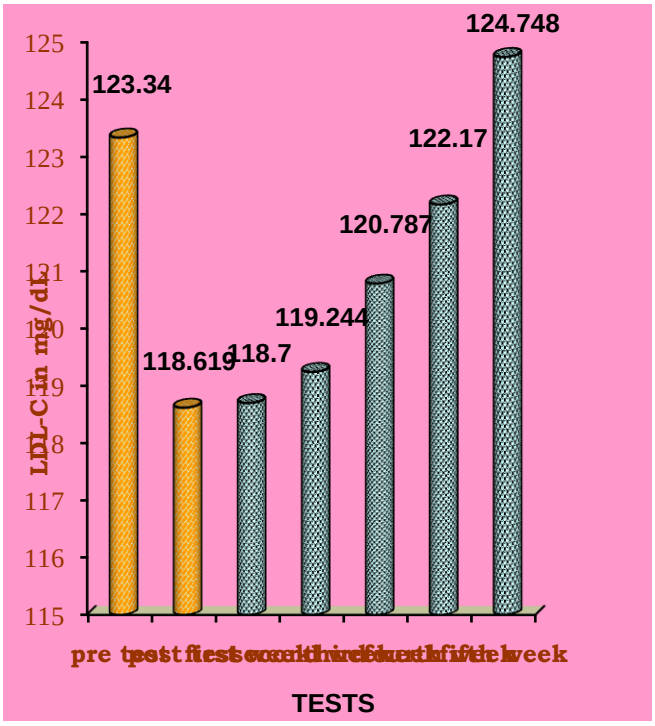

FIGURE II
FIGURE VIII: THE MEAN SCORES OF PRE, POST AND DETRAINING TEST VALUES ON LDL-COF MEN GROUP

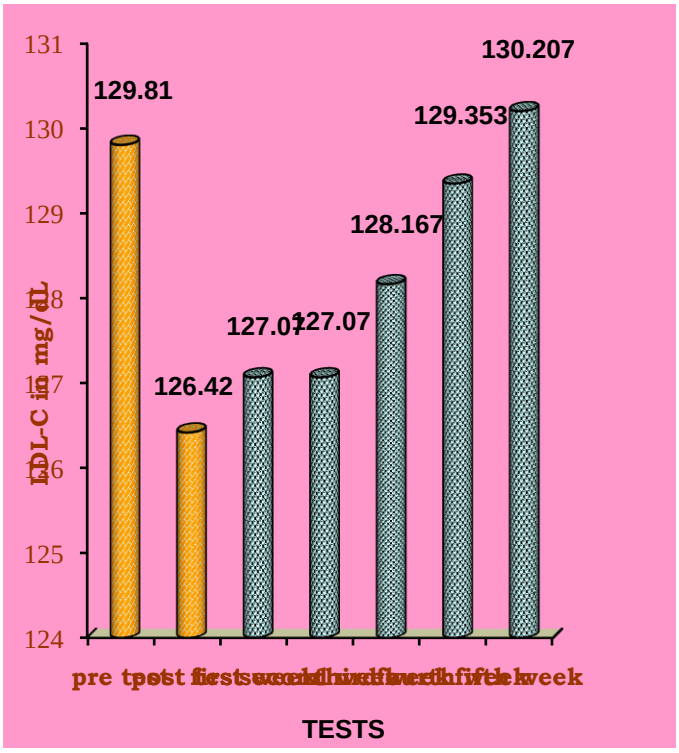

FIGURE III
THE MEAN SCORES OF PRE, POST AND DETRAINING TEST VALUES ON LDL-COF WOMEN GROUP
DISCUSSION

Therefore the results of the study indicate that the five weeks of detraining progamme, (after the 16 weeks low intensity aerobic training) decrease the LDL-C level among the men and women groups.

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