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Effect of Different Conditional Resistance Training on High Density Lipoprotein of Football Players

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Abstract

The purpose of the study was to investigate the impact of different conditional resistance training on high density lipoprotein of football players. Forty five football players from the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects. The age, height and weight of the subjects ranged from 18 to 25 years, 158 to 169 centimetres and 55 to 66 kilograms respectively. The selected subjects were randomly assigned into three equal groups of 15 subjects each. Group I underwent linear progressive resistance training, group II underwent staircase progressive resistance training and group III acted as control. Prior to and after the training the subjects were tested on selected criterion variable using standard test and procedures. Analysis of covariance was used to determine the significantly difference existing between pre test and post test on selected criterion variables. The result of the study proved that due to different conditional resistance training significantly altered the selected biochemical variables of football players.

Keywords: Different conditional resistance, Linear and Staircase.

Introduction

Cholesterol is the greatest health problem in our society but it is also essential to life. Cholesterol is not a deadly fat floating around in our arteries. Actually it is not fat at all, but rather an alcohol wax that at times behaves like fat. Cholesterol is a natural compound found in all animal tissues and is important for many structures and functions of our body. Cholesterol is one of the most important components of cell membranes, imparting stability and other properties. Cholesterol is also the precursor molecule for the synthesis of steroids, the largest group of hormones. Cholesterol and other blood lipids (fats and fat-like substances) are fat-soluble and thus cannot float around freely in the water-like medium of the blood. For this reason they are packaged into lipoproteins – spherical molecular complexes that transport and regulate blood lipids. Nearly all of the cholesterol in the blood is carried by low-density and high-density lipoproteins, or LDL and HDL, respectively. Chylomicrons and very-low-density lipo proteins (VLDL) are the largest lipoproteins which carry primarily triglycerides. Low-density lipoprotein (LDL) is the major cholesterol carrying lipoprotein. Elevated LDL levels herald a strong predisposition to coronary heart disease, stroke and peripheral vascular disease. LDL particles transport approximately three fourths of the total blood cholesterol, delivering cholesterol to tissues throughout the body for a variety of functions. High-density lipoprotein (HDL) has been aptly called the 'good' cholesterol because high levels of it reduce an individual's tendency to develop atherosclerosis. HDL protects the blood vessels by removing some of the cholesterol from the arterial walls and possibly by slowing cholesterol's entry into tissues.

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Methodology

Subjects and Variables

The purpose of the study was to investigate the impact of different conditional resistance training on selected biochemical variable of football players. Forty five football players were selected as subjects from the Department of Physical Education and Sports Sciences, Annamalai University. The age, height and weight of the subjects ranged from 18 to 25 years, 158 to 169 centimeters and 55 to 66 kilograms respectively. The selected subjects were randomly assigned into three equal groups of 15 subjects each. Group – I underwent linear progressive resistance training, Group – II underwent staircase progressive resistance training and group – III acted as control. HDL was assessed by Enzymatic calorimetric method.

Training Protocol

The experimental groups performed the linear progressive resistance training and staircase progressive resistance training programs three sessions per week on alternative days for 12 weeks. The intensity, volume and

density of training for both the experimental groups are the same, however the training load for the experimental group I was increased by linear progressive training method and for experimental group II staircase progressive training method was followed. The recovery period between exercises was sixty seconds and between sets three minutes. The intensity was fixed based on 1 RM of the subjects.

Experimental Design and Statistical Technique

The experimental design used in this study was random group design involving 45 subjects, who were divided at random in to three groups of fifteen each. All the three groups were selected from the same population. No effort was made to equate the groups prior to the commencement of the experimental treatment. The pre-test means of the selected dependent variable was used as a covariate. In order to nullify the initial differences the data collected from the three groups prior to and post experimentation on selected dependent variable was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all the cases level of confidence was fixed at 0.05 for significance.

Results

High Density Lipoprotein

The pre and post test data collected from the experimental and control groups on high density lipoprotein were statistically analysed by ANCOVA and the results are presented in table-I.

Table I. Analysis of covariance on high density lipoprotein of experimental and control groups

	Linear Progressive Resistance Training	Staircase Progressive Resistance Training	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	59.06	58.66	58.46	B	2.80	2	1.40	0.31
SD	1.86	2.49	1.88	W	186.01	42	4.42	
Post test Mean	73.06	71.93	58.73	B	1904.84	2	952.42	228.84*
SD	1.83	2.31	1.94	W	174.80	42	4.16	
Adjusted Post test Mean	73.13	71.92	58.68	B	1910.09	2	955.04	234.15*
				W	167.22	41	4.07	

*Significant at .05 level of confidence (The required table value for significance at 0.05 level of confidence with degrees of freedom 2 and 41 is 3.23 and degree of freedom 2 and 41 is 3.22)

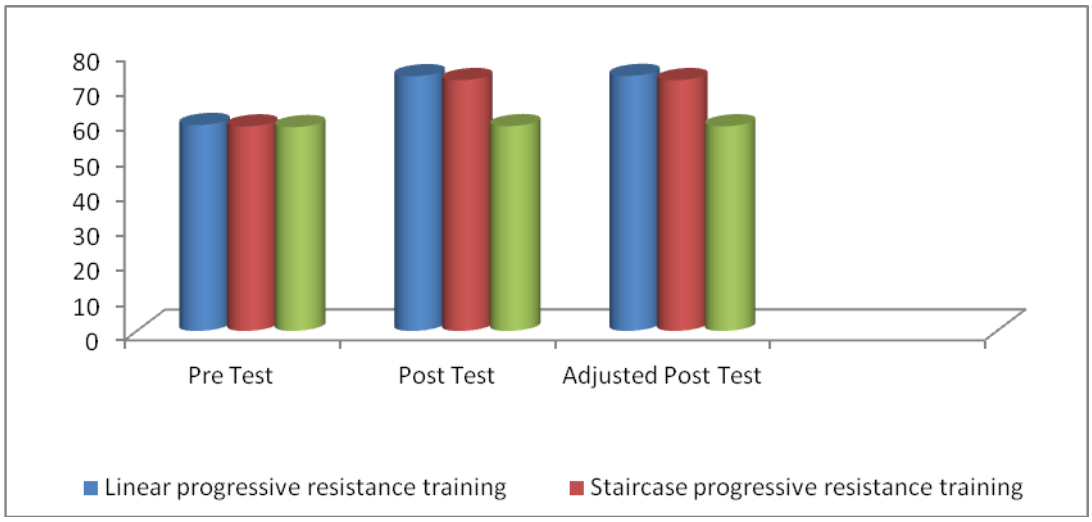
Table-I shows that the pre test mean and standard deviation on high density lipoprotein of linear progressive resistance training, staircase progressive resistance training and control groups are 59.06 $\pm$ 1.86, 58.66 $\pm$ 2.49 and 58.46 $\pm$ 1.88 respectively. The obtained 'F' ratio value of 0.31 for pre test means on high density lipoprotein of linear progressive resistance training, staircase progressive resistance training and control groups were less than the required table value of 3.23 for the degrees of freedom 2 and 42 at 0.05 level of confidence. It reveals that there is statistically insignificant difference among the linear progressive resistance training, staircase progressive resistance training and control groups during pre test period. It inferred that the random assignment of the subjects for the three groups is successful. The post test mean and standard deviation on high density lipoprotein of linear progressive resistance training, staircase progressive resistance training and control groups are 73.06 $\pm$ 1.83, 71.93 $\pm$ 2.31 and 58.73 $\pm$ 1.94 respectively. The obtained 'F' ratio value of 228.84 for post test means on high density lipoprotein of linear progressive resistance training, staircase progressive resistance training and control groups are greater than the required table value of 3.23 for the degrees of freedom 2 and 42 at 0.05 level of confidence. The adjusted post test means on high density lipoprotein of linear progressive resistance training, staircase progressive resistance training and control groups are 73.13, 71.92 and 58.68 respectively. The obtained 'F' ratio value of 234.15 on high density lipoprotein were greater than the required table value of 3.22 for the degrees of freedom 2 and 41 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted post test means of experimental and control groups on high density lipoprotein. Since, the adjusted post test 'F' ratio value is found to be significant the Scheffe's test is applied as post hoc test to determine the paired mean differences, and it is presented in table-II.

Table II. Scheffe's test for the difference between the adjusted post test paired means of high density lipoprotein

Adjusted Post Test Means			DM	CI
Linear Progressive Resistance Training	**Staircase Progressive Resistance Training**	**Control Group**		
73.13	71.92		1.21	1.32
73.13		58.68	14.45*	1.32
	71.92	58.68	13.24*	1.32

Table-II shows the Scheffe's test results that there is significant difference exists between the adjusted post tests means of linear progressive resistance training and control groups, staircase progressive resistance training and control groups on high density lipoprotein. And also there is no significant difference exists between linear progressive resistance training and staircase progressive resistance training.

Figure I. Cylinder diagram showing the mean value on high density lipoprotein of experimental and control groups



Discussion and Conclusions

The result of the study documented that different conditional progressive resistance training significant increase on high density lipoprotein though among the experimental training groups no difference on high density lipoprotein. The following studies are supporting with my study results. Tokmakidis and Volaklis, (2003), regular exercise training has beneficial effects on blood lipid profiles. Most important effect of exercise on human body alter on metabolic system specially lipid. Lipid and lipoprotein are cause of risk factors for coronary heart disease. (Sinderman, Pedersen and Kjekshus, 1997). Only a relatively small proportion is from HDL cholesterol. Tikkanen, Hamalainen and Harkonen, (1999) concluded 12 month home-based exercise training significantly increases HDL-C level in healthy men. The duration of exercise, rather than the intensity, is the more important factor in raising HDL cholesterol (Fogoros, 2009).

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