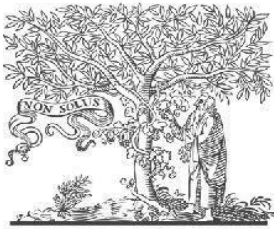


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Effect of Aerobic, Anaerobic and Resistance Training in Combination on Body Fat Percentage Among Young Men

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Abstract

Physical activity has been recognized as a best form preventive medicine for preventing many degenerative diseases like Cardiovascular Diseases like Hypertension, Atherosclerosis, Coronary Heart Disease etc, metabolic disorders like Diabetes Mellitus, Certain types of cancers and certain types of Psychological disorders. Regular physical activity in some form or other may show some positive effect on the health status of the individual. Well established relationship between physical activity and health of is realized globally and people are concerned in taking up regular exercises of different forms. The direct relationship between physical activity and physical fitness seems to be a logical substantiation for increments in physical activity and consequent increments in health status of individuals.

Introduction

Cardiovascular disease like Coronary Heart Disease has become a prominent cause of death across globe and the reason for this being the decreasing levels of physical activity. The preventive effects of regular physical activity should be understood with respect to different forms of exercises and combinations on the different factors and markers which precipitate the condition of atherosclerosis of arteries. Energy surplus in human beings could cause obesity and obesity in turn could cause hyperlipidemia a precursor condition which could precipitate the process of atherosclerosis. Hypertensive individuals are more prone to endothelial dysfunction leading to quicker plaque formation. Thromboembolic factors like should be controlled along with the control of the lipids which precipitate the condition like low density lipids like LDL cholesterol. Aerobic exercises

have long been studied on the factors and markers of the Coronary Heart Disease and been found as effective means in controlling them. Resistance training also been studied and found that the resistance training also would be helpful in controlling several markers and factors of the atherosclerosis. But, there have been very less studies which studied the concurrent and combined training effects of different forms of exercises on the factors and makers of and Coronary heart disease (⁶ **Shaw I.** Hence, the present study studied the effect of aerobic running combined with resistance training, anaerobic running combined with resistance training and aerobic running and anaerobic running on Body fat percentage.

Objectives of The Study

1. To understand the effect of combined aerobic running with resistance training

combined anaerobic running with resistance training and combined aerobic running and anaerobic running on Body fat percentage among the individuals.

2. To compare and understand which combination of exercise training among the three combinations of exercise training of the study would cause significant decrements in Body fat percentage among the individuals.

Methodology

Eighty male student volunteers from different colleges in and around Kakinada area were randomly assigned to four different groups of the study. Three groups acted as activity groups and one acted as control group. Activity groups practiced the three different combinations of exercise training for five months. The three combinations of exercise training were medium intensity aerobic running with medium intensity resistance training, medium intensity anaerobic running (sprint running) and medium intensity resistance training and medium intensity aerobic running and medium intensity anaerobic running. The age of the individuals ranged between eighteen and twenty. All the individuals selected for the study were previously untrained on regular basis. The intensity for aerobic running was fixed as percentage of the maximum heart rate of the individuals and the maximum heart rate of the individuals was calculated basing on the Miller's formula i.e. $220 - \text{age}$. The intensity fixed for aerobic running was fixed between fifty-five to sixty-five percent of MHR. The intensity for anaerobic running or sprinting was fixed as a percentage of their maximum speed recorded in hundred meters sprint in terms of time. The speed of each hundred meters anaerobic run was decided on the extrapolated timing in seconds for the hundred meters basing on the maximum performance on the hundred meters by each individual. The intensity of difficulty for this training was fixed basing on the body weight

of the individuals and not on the one repetition maximum. Initially the individuals exercised different resistance form of exercises as incorporated into protocol of the study at fifty-five percent of their body weight for the first two months and then at sixty-five percent of their body weight during the later three months.

Criterion variables and reliability

The criterion variables selected for the experimentation is Body composition (Body fat percentage only). Effect of the selected combinations of exercise training was tested on the variable.

Analysis on Data and Results of The Study

Analysis on the Body Fat Percentage

Table IV elicits that the obtained F value for Body Fat Percentage is 26.417 and the same is much higher when compared to the critical F value for the selected degrees of freedom ie 2.76. This shows that there is significant effect on the Body Fat Percentage of the individuals of the study because of the conducted different combinations of experimental exercise protocols and also this indicates that there is significant difference between the pre test Body Fat Percentage levels and the post test Body Fat Percentage levels of the individuals of the study.

Table IV
ANCOVA Table for Body Fat Percentage

SOURCE	DF	SS	MS	F	CR. F
TOTAL	199	30.53146			
BG	3	8.790732	2.930244	26.41713	2.76
WG	196	21.74073	0.110922		

As per table V the difference between the adjusted post test mean and the pre test mean was -0.379 (MY.X-MX) for Aerobic and Resistance exercises combination group, -1.581 for the Anaerobic and Resistance exercises combination group, -0.349 for the Aerobic and Anaerobic exercises combination group and -0.54 for the control group. Taking into consideration of these mean differences it was noted that the Anaerobic and resistance exercises combination group could bring more decrements in the Body Fat Percentage levels of the

difference between the Aerobic and resistance exercise

Table V
Pre test, Post test, Adjusted post test means and mean differences for Body Fat Percentage

GROUPS	N	MX	MY	MY.X	MY.X-MX
Aero+resis	50	20.165	19.536	19.78524	-0.37976
Anae+resis	50	20.554	19.0995	18.97295	-1.58105
Aero+Anae	50	20.038	19.317	19.68893	-0.34907
Con	50	20.9925	21.002	20.45183	-0.54067

individuals followed by Aerobic and resistance exercises combination group and followed by Aerobic and Anaerobic exercises combination group. The mean difference for the control group signifies that the control group individuals have in fact lost their resting Body fat Percentage levels during the study period for unknown reasons and is an exception.

Table VI depicts the Scheffe's Post Hoc individual comparison for the Body Fat Percentage among the four groups of experimentation. According to the table the mean differences between the Anaerobic and resistance exercise combination group and the control group (-1.488), the mean difference between the Aerobic and Anaerobic exercise combination group and the control group (-0.77) and the mean

Figure III

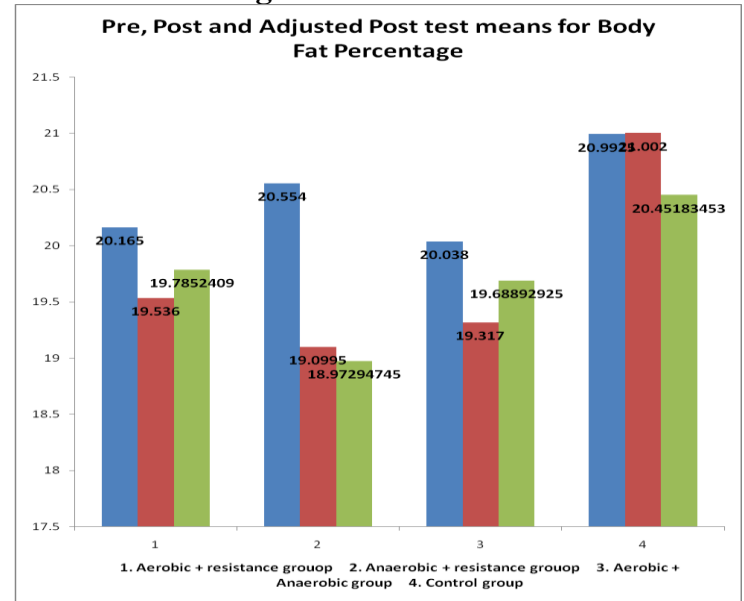


Figure IV

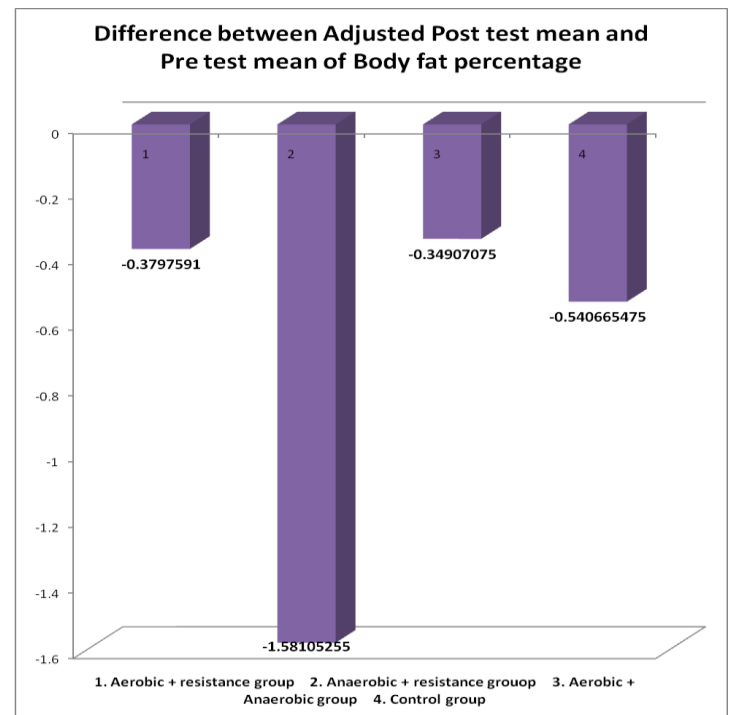


Table VI

Scheff's Post Hoc individual comparison test for Body Fat Percentage (Comparison Difference =0.34)

GROUPS	Anae+Resis	Aero+Anaer	Aero+Resis
VALUES	18.972	19.69	19.78
Aero+Anaer			
19.69	-0.718		
	Sig		
Aero+Resis			
19.78	-0.808	-0.09	
	Sig	N.Sig	
Con			
20.46	-1.488	-0.77	-0.68
	Sig	Sig	Sig

combination group and the control group (-0.68) were significantly higher when compared to the comparison difference ie 0.34. This indicates that all the three different combinations of exercise groups got significant decrements in their resting Body Fat Percentage levels because of the experimental exercise combination protocols. The table clearly indicates that the Anaerobic and resistance training combination group showed significant decrements in the Body Fat Percentage when compared to the Aerobic and Anaerobic exercise combination group (-0.718) and Aerobic and resistance exercise combination group (-0.808). But, there is no significant difference between the Aerobic and Anaerobic exercise combination group and Aerobic and resistance exercise combination group(-0.09), indicating that these two groups are identical in bringing effect on the Body Fat Percentage levels of the individuals of the study.

Discussion on findings

Effect of experimental combination exercises on the Body Fat Percentage

All the three combinations of exercise groups viz Aerobic plus resistance exercise group, anaerobic plus

resistance exercise group and aerobic and anaerobic exercise group have shown significant decrements in their Body fat percentage levels when compared to the control group. Hence medium intensity aerobic running followed by medium intensity resistance training, medium intensity anaerobic sprinting followed by medium intensity resistance training and medium intensity aerobic running followed by medium intensity anaerobic sprinting are all effective to bring significant decrements in one of the Cardiovascular health factors of individuals ie Body fat percentage. But, among all the three combinations of exercises used in the experimentation, the anaerobic running followed by resistance exercise training brought significant decrements in Body fat percentage of individuals when compared to Aerobic running followed by anaerobic running training and aerobic running followed by resistance training. One of the primary risk factors of the cardiovascular problems ie Body fat percentage seems to get influenced more on the resting metabolic rate. Higher the resting metabolic rate of the individuals, the more favorable the fats are utilized during the resting period also, which might cause for the significant reductions in the storage fat portion of the individuals. Both anaerobic sprinting and resistance form of exercises make positive changes in protein turnover during the post exercise period and hence increments in the lean body mass of the individuals, which require more energy to meet the metabolic requirements.

Conclusions from The Study

The following conclusions were derived from the analysis and results:

1. All the three exercise combinations of training viz medium intensity aerobic running with medium intensity resistance training, medium intensity aerobic running with medium intensity anaerobic running (sprint running) and medium intensity anaerobic running with medium intensity resistance training for five months have brought significant decrements in Body fat percentage of the individuals.
2. Medium intensity anaerobic running with medium intensity resistance training combination for five months has brought highly significant decrements in Body fat percentage when compared to the other two combinations of exercise training for five months.

References

1. Siddiqui NI, Nessa A, Hossain MA et.al. Regular physical exercise: way to healthy life. Mymensingh Med J. 2020 Jan; 19(1):154-8.
2. Woolf K, Reese Ce, Mason Ce, Mason MP et.al. Physical activity is associated with risk factors for chronic disease across adult women's life cycle. J Am Diet Assoc. 2018; 108(6):948-59.
3. Koba S and Hirano T. Dyslipidemia and atherosclerosis. Nippon Rinsho. 2021; 69(1):138-43.
4. Fibrinogen Studies Collaboration, Kaptoge S, White IR et.al. Associations of plasma fibrinogen levels with established cardiovascular disease risk factors, inflammatory markers, and other characteristics: individual participant meta-analysis of 154,211 adults in 31 prospective studies: the fibrinogen studies collaboration. Am J Epidemiol, 2017; 166(8): 867-879.
5. Halverstadt A, Phares DA et.al. Endurance exercise training raises high-density lipoprotein cholesterol and lowers small low-density lipoprotein and very low-density lipoprotein independent of body fat phenotypes in older men and women. Metabolism. 2017; 56(4):444-50.
6. Shaw I, Shaw BS et.al. Concurrent resistance and aerobic training as protection against heart disease. Cardiovasc J Afr. 2020; 21(4): 196-199.