EFFECT OF HIGH AND MODERATE INTENSITIES OF AEROBIC TRAINING ON SELECTED PHYSIOLOGICAL PARAMETERS OF UNTRAINED MEN

Kancherla Raja Ramesh Babu, Ph.D -Research Scholar, Department of Physical Education and Sports Sciences, Acharya Nagarjuna University, Ongole Campus, Ongole - 523 001,Andhra Pradesh, India.

Dr. I. Devi Vara Prasad, Assistant Professor, Department of Physical Education and Sports Sciences, Acharya Nagarjuna University, Ongole Campus, Ongole - 523 001, Andhra Pradesh, India.

ABSTRACT

The intention of this investigation was to compare the effect of different intensities of aerobic training on selected physiological parameters of untrained men. To achieve the purpose of the study 45 untrained men were selected as subjects. The subjects' age ranged from 20 years to 23 years. The selected subjects were divided into three groups namely high intensity aerobic training group (I), moderate intensity aerobic training group (II) and control group (III). The experimental groups I and II underwent twelve weeks of high and moderate intensity aerobic training and group III acted as control. All the subjects of the three groups were tested before and after the experimental period on resting heart rate and breath holding time. To find out the changes in the selected dependent variable, due to the application of independent variables, Analysis of Co-variance (ANCOVA) statistical technique was applied on each dependent variable. Whenever the obtained 'F' ratio for adjusted post test means was found significant, Scheffe's post hoc test was applied to determine which of the three paired means significantly differed. It was concluded that due to the effect of high and moderate intensities of aerobic training the resting heart rate and breath holding time of the untrained men were notably altered. It was also concluded that moderate intensity aerobic training was significantly better than high intensity aerobic training in reducing resting heart rate of the untrained men, however insignificant differences were found between high and moderate intensity aerobic training groups in improving breath holding time.

Key words: Aerobic training, physiological parameters and untrained men

INTRODUCTION

Exercise is an incredibly important part of a healthy person's life. Exercising regularly helps to hone one's athletic skills by strengthening the muscles across the bodies, and also by enhancing the functioning of all internal organs. Moreover different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurological process which are specific to the activities. There are plenty of different ways to exercise and all of them can be turned into a fun and entertaining outing.

Regular exercise and physical activity are extremely important and beneficial for long-term health and well-being. General fitness training works towards broad goals of overall health and well-being, rather than narrow goals of sport competition, larger muscles or concerns over

appearance. A regular moderate workout regimen and healthy diet can improve general appearance markers of good health such as muscle tone, healthy skin, hair and nails, while preventing age or lifestyle-related reductions in health and the series of heart and organ failures that accompany inactivity and poor diet.

The aerobic training has become highly structured training for fitness enhancement. It has vastly different training effects depending upon the intensity and duration of the work and rest period. More research is required concerning the variation in different methods of aerobic training and its effects. The applicability of this method of training to develop physiological parameters is not yet completely known. Hence, there is a need to find out whether high and moderate intensities of aerobic training are the helpful training protocols in improving the selected physiological parameters of untrained men.

METHODOLOGY

Subject and Variable

To achieve the purpose of the study 45 untrained men from Acharya Nagarjuna University, Ongole, Andhra Pradesh, India were selected as subjects. The subjects' age ranged from 20 years to 23 years. The selected subjects were divided into three groups namely high intensity aerobic training group (I), moderate intensity aerobic training group (II) and control group (III). The selected physiological parameters such as resting heart rate and breath holding time were selected as dependent variable and were assessed by using standard test and procedures.

Training Programme

The experimental groups performed aerobic training alternatively six days in a week for twelve weeks. In this present investigation continuous running was given as aerobic exercise. To fix the training load for the aerobic exercise groups the subjects were examined for their exercise heart rate in response to different work bouts, by performing continuous running of two minutes duration for proposed repetitions and sets, alternating with active recovery based on work-rest ratio. The subject's training zone was computed using Karvonen formula and it was fixed at 80%HRmax to 95%HRmax for the high intensity aerobic training group and 60%HRmax to 75%HRmax for the moderate intensity aerobic training group. The work rest ratio of 1:1 between exercises and 1:3 between sets was given.

Collection of the Data

The pretest data was collected prior to the training and posttest data was collected after the twelve weeks of experimental treatment, from the experimental and control groups.

Experimental Design and Statistical Technique

In order to nullify the initial mean differences the data collected from the three groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). The pre test means of the selected dependent variables was used as a covariate. Since three groups were involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test. In all the cases the level of confidence was fixed at 0.05 level for significance.

RESULTS

The pre and post test data collected from the experimental and control groups on resting heart rate and breath holding time were statistically analyzed by ANCOVA and the results are presented in table- I

**Table-I: Analysis of Covariance on Selected Physiological Parameters
of Experimental and Control Groups**

| Variables	High intensity aerobic	Moderate intensity aerobic	Control Group	S o V	Sum of Squares	df	Mean squares	'F' ratio
Resting heart rate	69.79	67.71	71.85	B	41.39	2	20.69	4.17*
				W	203.06	41	4.95	
Breath holding time	33.35	34.35	30.33	B	104.75	2	52.37	5.31*
				W	404.61	41	9.86	

(Required table value for significance with degrees of freedom 2 and 41 is 3.23)
Significant at .05 level of confidence

The adjusted post test means on resting pulse rate of high intensity aerobic training, moderate intensity aerobic training and control groups are 69.79, 67.71 and 71.85 respectively. The obtained 'F' ratio value of 4.17 on resting pulse rate is greater than the required table value of 3.23 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 resting pulse rate.

The adjusted post test means on breath holding time of high intensity aerobic training, moderate intensity aerobic training and control groups are 33.35, 34.35 and 30.33 respectively. The obtained 'F' ratio value of 5.31 on breath holding time is greater than the required table value of 3.23 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 breath holding time.

Figure – I:Diagram Showing the Adjusted Post Test Mean Value on Resting Heart Rate and Breath Holding Time of Experimental And Control Groups
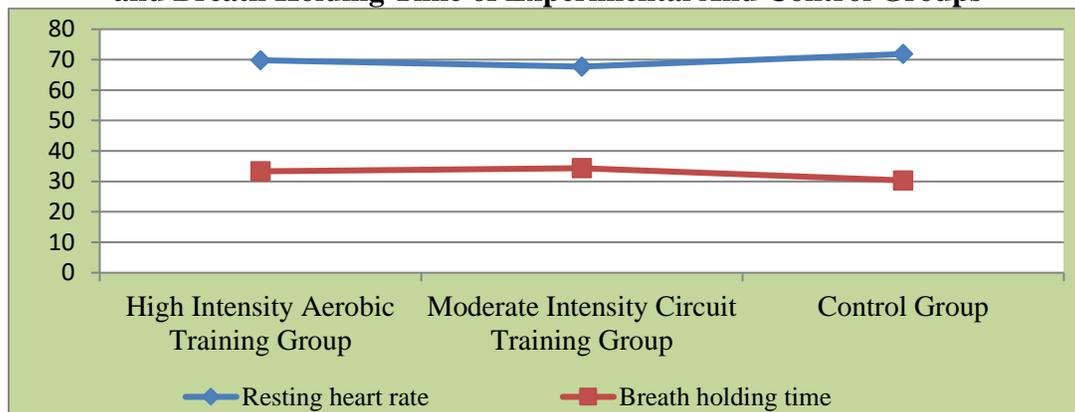
Since, the adjusted post test 'F' ratio value was found to be significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, and it is presented in table-II.

Table-II: Scheffe's Test for the Difference between the Adjusted Post Test Paired Means of Selected Physiological Parameters

Variables	Adjusted Post Test Means			DM	CI
	High intensity aerobic group	Moderate intensity aerobic group	Control Group		
Resting heart rate	69.79	67.71		2.08*	
	69.79		71.85	2.06*	2.06
		67.71	71.85	4.14*	
Breath holding time	33.35	34.35		1.00	
	33.35		30.33	3.02*	2.91
		34.35	30.33	4.02*	

Significant

The Scheffe's test results shows that significant differences exist between the adjusted post tests means of high intensity aerobic training and moderate intensity aerobic training (2.08); high intensity aerobic training and control groups (2.06); moderate intensity aerobic training and control groups (4.14) on resting pulse rate, since the mean differences are higher than the

confident interval value of 2.06. Moreover moderate intensity aerobic training had high impact to decrease the resting pulse rate of the subjects.

The Scheffe's test results also shows that significant differences exists between the adjusted post tests means of high intensity aerobic training and control groups (3.02); moderate intensity aerobic training and control groups (4.02) on breath holding time, whereas there is no significant differences between the adjusted post tests means of high and moderate intensity aerobic training groups (1.00) on breath holding time. Due to the effect of moderate and high intensities of aerobic training the breath holding time of the untrained men was notably increased, however insignificant differences were found between high and moderate intensity aerobic training groups in increasing the breath holding time of the untrained men.

DISCUSSION

The focus of aerobic training is to progressively overload the cardio respiratory system and not the musculoskeletal system. More consistent and well documented adaptations to aerobic training include increases in oxidative enzyme activity (Bell, 2000; Nelson, 1990) all of which contribute to the enhanced delivery, extraction, and utilization of oxygen by skeletal muscle. Short-term daily conditioning protocol of aerobic exercise program induces significant improvements in both aerobic capabilities and anaerobic performance (Sartorio et al., 2003). These results are also in conformity with the following findings. Balci et al., (2010) inferred that resting heart rate was significantly reduced in both the walk-to-run transition speeds groups. Stone et al., (1991) observed a reduction in pulse rate from training, which is considered beneficial.

Aerobic exercise refers to the variety of exercise that stimulates heart function and lungs activity for a time period sufficiently long to produce beneficial changes in the body. Regular aerobic exercise results in an increase in the blood flow and improves oxygen carrying and waste removal capacity and further increases work load capacity (Vitale, 1973). Gillett and Elsenman (1987) in their study determined the effect of 16 weeks aerobic dance programme and was concluded significant improvement in the heart rate. Sayed (1996) concluded that high, but not low, intensity physical conditioning significantly enhances the cardio respiratory fitness and reduces the resting level. Exercise increases the volume of hemoglobin and erythrocyte of the blood. Also blood vessels are seen to maintain elasticity and suppleness when stressed systematically probably by the beneficial effect of the heart.

CONCLUSION

Due to the effect of moderate and high intensities of aerobic training the resting heart rate and breath holding time of the untrained men were notably altered. It was also concluded that moderate intensity aerobic training was significantly better than high intensity aerobic training in reducing resting heart rate of the untrained men, however insignificant differences were found between high and moderate intensity aerobic training groups in improving breath holding time.

REFERENCE

Balci, S.S., Okudan, N., Pepe, H., Gokbel, H., Revan, S., Kurtoglu, F., Akkus, H. (2010). Changes in lipid peroxidation and antioxidant capacity during walking and running of the same and different intensities, *J Strength Cond Res*., 24 (9): 2545-50.

Bell, G.J., Syrotuik, D., Martin, T.P., Burnham, R., & Quinney, H.A. (2000). Effect of concurrent strength and endurance training on skeletal muscle properties and hormone concentrations in humans, *European Journal of Applied Physiology,* 81: 418–427.

Gillett, PA. & Elsenman, PA. (1987). "The effect of intensity controlled aerobic dance exercise on aerobic capacity of middle aged, overweight women", *Res. Nurse. Health,* 10(6): 383-90.

Nelson, A.G., Arnall, D.A., Loy, S.F., Silvester, L.J., & Conlee, R.K. (1990). Consequences of Combining Strength and Endurance Training Regimens, *Physical Therapy,* 70: 287-294.

Sartorio A., Lafortuna C.L., Silvestri G., Narici M.V., (2003). Effects of short-term, integrated body mass reduction program on maximal oxygen consumption and anaerobic alactic performance in obese subjects, *DiabetesNutrMetab*.,16(1):24-31.

Sayed, S., (1996). Effects of high and low intensity aerobic conditioning programs on blood fibrinolusis and lipid profile, *Blood congul fibrinolysis,* 7:4, P.484 – 90.

Stone, M.H., Fleck, S.J., Triplett, N.T., & Kramer, W.J. (1991). Health- and performance-related potential of resistance training. *Sports Medicine*, 11, 210-231.

Vitale, Frank, (1973). *Individualized Fitness Programs,* Englewood Cliffs, New Jersey Prentice Hall Inc., p.9. 144.