Effect of High Intensity Circuit Training on Lactate Dehydrogenase

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Abstract

The under lying principal of the study was to find out the effect of high intensity circuit training on biochemical variable (Lactate Dehydrogenase). To achieve the purpose of the study, 30 untrained male students from the Department of Physical Education and Sports Sciences, Annamalai University were selected at random as subjects from volunteers, in the age group of 18 to 20 years. The selected subjects neither have the experience of organized fitness training nor participating in any other special coaching programme. The chosen subjects were randomly assigned into two groups of 15 each. Group I, underwent high intensity circuit training and group II acted as control subjects. To examine the effect of high intensity circuit training on biochemical variables, analysis of covariance (ANCOVA) was used. The result of the study shows there is significant difference between High intensity circuit training group and control group.

Keywords: High Intensity, Circuit Training, Dehydrogenase.

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

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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.

Methodology

The purpose of the study was to find out the effect of high intensity circuit training on biochemical variable (Lactate Dehydrogenase). To find the Effect High Intensity Circuit Training on Lactate Dehydrogenase. To achieve the purpose of the study, 30 untrained male students from the Department of Physical Education and Sports Sciences, Annamalai University were selected at random as subjects from volunteers, in the age group of 18 to 20 years. The selected subjects neither have the experience of organized fitness training nor participating in any other special coaching programme. The chosen subjects were randomly assigned into two groups of 15 each. Group I underwent high intensity circuit training and group II acted as control subjects. The significance was tested at 0.05 levels.

Biochemical Variables		
Lactate Dehydrogenase	' Optimized standard method' conforming to the recommendations of the Deutsche Gesell SchaftfürKlinischeChemie (1970) using the 'Boehringer Mannheim' kit.	u/l

Calibration of Instruments

The blood sample was estimated in Research Laboratory of Division of Biochemistry, Rajah Muthaiah Medical College, Annamalai University. For the blood test standard solutions, reagents and chemicals were used. Further, the instrument involved in blood test confirmed scientific standard.

Biochemical Variables		
1.	Lactate Dehydrogenase	0.989	0.01

Table value required for 8 df at 0.01 level of significance is 0.765.

High Intensity Circuit Training Regimens

Week	No. of Station	Duration for Unloaded & Loaded Exercise (seconds)	Percentage of 1RM for Loaded Exercise	No. of Circuit	Recovery between Circuit (minutes)	Recovery between Exercise (seconds)
I & II	10	30	50	2	3	15
III & IV	10	35	55	2	3 ½	17
V & VI	10	35	55	3	4	20
VII & VIII	10	40	60	3	4 ½	23
IX & X	10	45	60	3	5	25

Experimental Protocols

The experimental groups I was subjected to ten weeks of high intensity circuit training programmes respectively. Training was given during alternative days for three days a week for the experimental group. The circuit training programme was scheduled for one session per day in the morning between 6.30 and 8.00 am. During every session the workout lasted approximately for 90 minutes inclusive of warming up, training and warm down process. Circuit training was given under the direct supervision of the investigator. The control group did not participate in any of the circuit training programme.

Assay of Serum Total Lactate Dehydrogenase
Method

The serum total lactate dehydrogenase was estimated by the 'optimized standard method' conforming to the recommendations of the Deutsche Gesellschaft fur klinischeChemie (Klin, 1970), using the 'Boehringer Mannheim' kit.

Reagents used

a.   Phosphate buffer :   51.70   mmol/l
b.   Pyruvate   :   0.62   mmoll
c.   NADH   :   0.19   mmol/l
d.   pH   :   7.50

Procedure

The auto analyzer kit used for this test was from 'Boehringer Mannheim' company, Germany. Fifty microliters of serum was added to 3.0 ml of the reagent in a test tube mixed well and stood for 30 seconds at 37°C temperature and poured into cuvette. Initial absorbance was read at 340 nm. Subsequently absorbance was read three times at one-minute interval and the mean absorbance per minute (ΔA) was found out. The calculation was done using the factor 9683, (wavelength: 340nm, temperature: 37°C and unit of measurement: u/l).The total lactate dehydrogenase activity was expressed as u/l of serum.

Collection of Data

During training period the data onlactate dehydrogenase were collected before and after circuit training from experimental and control group. The pre, post tests were conducted under identical condition.

Statistical Technique

To examine the effect of high intensity circuit training on biochemical variables, analysis of covariance (ANCOVA) was used.In determining the level of significance 0.05 was fixed.

Analysis of Lactate Dehydrogenase

The mean and standard deviation values on lactate dehydrogenase of high intensity circuit training group and control group have been presented in table 1. The details of lactate dehydrogenase during six testing periods among three groups are graphically illustrated in

High Intensity

In the same way the following intensity combination of the same five unloaded and five loaded circuit exercises alternatively with 30 seconds duration per station, 50% of 1RM for loaded exercises, for two circuits with an interval of three minutes between circuits, the subjects had the pulse rate between 155 to 170 beats per minute. This confirmed the high intensity of circuit training (Bompa, 1999). Hence, this combination is followed in the present study

figure 1. The analysis of covariance for the pre and post-tests data on lactate dehydrogenase of experimental and control groups have been analysed and presented in table I.

Table I. Analysis of Covariance for Pre and Post Tests Data on Lactate Dehydrogenase of Experimental and Control Group

Group \ Test	High Intensity Circuit Training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
Pretest Mean	65.20	61.60	Between	129.60	2	64.80	1.57
SD	6.18	7.62	Within	1724.40	42	41.06	
Posttest Mean	99.67	64.60	Between	9841.38	2	4920.69	44.76*
SD	14.84	6.23	Within	4616.93	42	109.93	
Adjusted Posttest Mean	98.22	67.49	Between	6942.09	2	3471.04	67.02*
			Within	2123.41	41	51.79	

* Significant at 0.05 level.
The table value required for significance at 0.05 level of confidence with degrees of freedom 2, 41 is 3.23 and degree of freedom 2, 42 is 3.22.

Figure 1. Graphical Representation of Pretest, Posttest High Intensity and Control Groups on Lactate Dehydrogenase
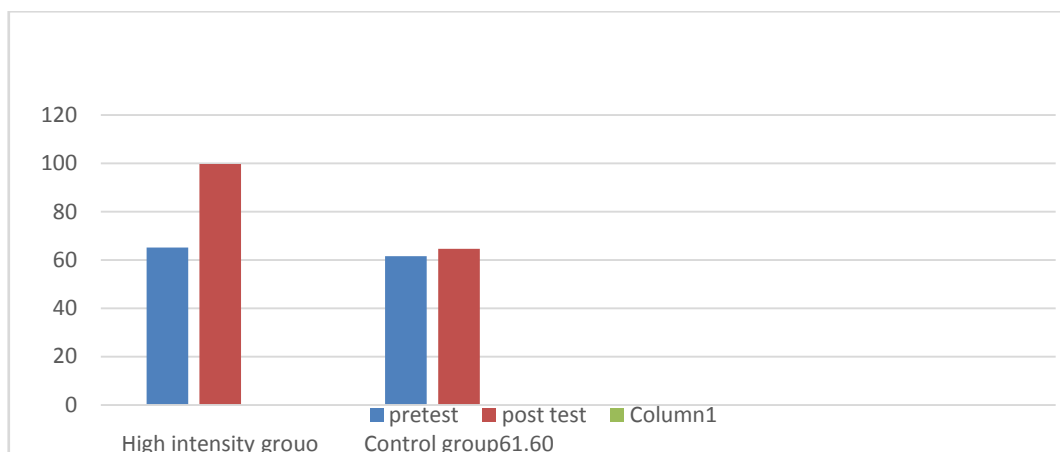
The 'F' ratio value of 44.76 for post-test data on lactate dehydrogenase is significant at 0.05 level.

The 'F' ratio value of 67.02 for adjusted post-test on lactate dehydrogenase is significant at 0.05 level. It reveals that there is significant difference among the groups on lactate dehydrogenase as a result of high intensity circuit training.

Conclusion

It reveals that experimental groups have significantly increased the lactate dehydrogenase as compared to control group. The result of the study shows there is significant difference between High intensity circuit training group and control group.

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