EFFECTS OF AEROBIC TRAINING AND ANAEROBIC TRAINING FOLLOWED BY CESSATION ON 800 METERS RUNNING PERFORMANCE

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Abstract

The purpose of the study was to find out the effects of aerobic and anaerobic training followed by cessation on the performance of 800 meters running of Anna University men players. Forty five male subjects were selected and they were divided into three equal groups of fifteen each. Experimental group I underwent Aerobic Training and group II underwent Anaerobic Training and for the training period of 12 weeks and group-III (Control group) did not involve in any training. All the subjects were tested prior to and after the training and during detraining period. The data collected from the three groups prior to and post experimentation and detraining on 800 mts performance was statistically analyzed by using two way (3x6) factorial ANOVA with last factor repeated measures. Whenever the obtained F-ratio for interaction effect was found to be significant, the simple effect test was used as a follow up test. Since, three groups and six different stages of test were compared, whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed. The results of the study indicated that the experimental group's namely aerobic training and anaerobic training group had significantly influenced the performance of 800mts running. It is found that aerobic training group has significantly improved the selected dependent variable when compared to the anaerobic training group. Further significant reduction in the performance of 800 meters running was found during the third and fourth cessation of detraining period.

Keywords: Control group, Scheffe's test, ANOVA, Aerobic, cessation

Introduction

Physically fit people of all ages have the freedom to enjoy most of lives daily. Current health fitness standards may not be enough to achieve these objectives. Sound physical fitness gives the individual degree of independence throughout life. Most adults should be able to carry out activities similar to those they conducted in their youth, though not with the same intensity. An excellent performance in a particular activity must possess in addition to motor fitness, the specific skills that are part of activity. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. Training is widely used in sports. The Complex nature of training involving physical exercises along with other means becomes obvious when one looks at the training of advanced sports persons. Training is done for improving performance. The aim of the present study was to assess the effects of aerobic training and anaerobic training followed by cessation on 800 Meters running performance.

Methodology

To achieve this purpose of the study, forty five (N=45) men students studying in various affiliated Engineering colleges of Anna University Zone VII and who participated in inter collegiate tournaments during the year 2012-2013 were randomly selected as subjects. The selected subjects were divided into two experimental groups and one control group with fifteen subjects in (n=15) each. The age of the subjects was between 18 to 21 years. The selected subjects were divided into two experimental groups and one control group with fifteen subjects in (n=15) each. Experimental group I underwent Aerobic Training and group II underwent Anaerobic Training and for the training period of 12 weeks and group- III (Control group) did not involve in any training. All the subjects were tested prior to and after the training and during detraining period. The data on 800 mts run was assessed by 800mts run test. Pre- test data were collected two days before the training programme and post test data were collected on immediately after the twelfth week of training session. De training effects were assessed every three weeks from thirteenth to twenty fourth weeks.

Training Programme

During the training period, the experimental groups underwent the irrespective training programmes in addition to their daily routine activities as per the schedule. Group I underwent Aerobic training Continuous Running), Group II underwent Anaerobic training (Resistance Training) and Group III acted as control. The duration of training session in all the three days in a week was approximately between forty five minutes to one hour which included warming up and warm down. The continuous running was performed with 60-80 MHR. (Maximum Heart Rate)

The Training Schedule of Resistance Training Group

Week	Days	Warm up	Intensity	Repetition	Sets	Rest between the sets	Duration	Warm down
I-IV	Weekly 3 days	10 min	60%	10-20	1-3	90-120 sec	40 min	10 min
V-III		10 min	70%	10-20	1-3	90-120 sec	40 min	10 min
IX-XII		10 min	80%	10-20	1-3	90-120 sec	40 min	10 min

Statistical Techniques

The data collected from the three groups prior to and post experimentation and detraining on Systolic Blood Pressure was statistically analyzed by using two way (3x6) factorial ANOVA with last factor repeated measures (Broota,1989). According to Thomas and Nelson (1985), whenever the main purpose usually lies in the interaction, it is sufficient to discuss the interaction effect only, unless some special circumstances exist, interest in testing the main effects is usually limited. Hence, whenever obtained F-ratio for interaction effect was found to be significant, the simple effect test was used as a follow up test. Since, three groups and six different stages of test were compared, whenever obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as

post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

Table 1: The Mean and Standard Deviation on 800 Meters Run of Pre Test, Post Test and Four Cessations Data of Experimental Groups

Groups		Pre Test	Post Test	First Cessation	Second Cessation	Third Cessation	Fourth Cessation
Aerobic Training Group	Mean	2.538	2.237	2.281	2.376	2.475	2.506
	SD	0.058	0.104	0.101	0.071	0.054	0.060
Anaerobic Training Group	Mean	2.625	2.401	2.392	2.467	2.540	2.633
	SD	0.067	0.110	0.099	0.085	0.075	0.064
Control Group	Mean	2.661	2.609	2.615	2.598	2.608	2.586
	SD	0.168	0.151	0.079	0.118	0.119	0.091

Table 2: The Two Way Analysis of Variance on 800 Meters Run of Aerobic Training, Anaerobic Training and Control Groups at Six Different Stages of Testing Periods

Source of Variance	Sum of Squares	Df	Mean Squares	F-ratio
Afactor (Groups)	1.899	2	0.950	26.340*
Error I	1.514	42	0.036	
Bfactor (Tests)	1.470	5	0.294	67.799*
AB factor (Interaction) (Groups and Tests)	0.705	0	0.071	16.266*
Error II	0.911	210	0.004	

*Significant at 0.05 level

The table values required for being significant at 0.05 level of confidence with df -2 and 42, 5 and 210 & 10 and 210 were 3.22, 2.56 and 1.87 respectively

The results of the study indicate that there is a significant difference in the interaction effect (between rows (Groups) and columns (Tests) on 800mrs run. Since, the interaction effect was significant, the simple effect test was applied as follow up test and they are presented in Table-3.

Table 3: The Simple Effect Scores of Groups (Rows) at Three Different Stages of Tests (Columns) on 800 Meters Run

Source of Variance	Sum of Squares	Df	Mean Squares	F-ratio
Groups Within Pre test	0.121	2	0.060	13.913*
Groups Within Post test	1.043	2	0.521	120.223*
Groups Within First Cessation	0.868	2	0.434	100.038*
Groups Within Second Cessation	0.373	2	0.187	43.063*
Groups Within Third Cessation	0.132	2	0.066	15.223*
Groups Within Fourth Cessation	0.068	2	0.034	7.860*
Tests and Aerobic Training Group	1.271	5	0.254	58.629*
Tests and Anaerobic Training Group	0.854	5	0.171	39.395*
Tests and Control Group	0.050	5	0.010	2.308*
Error II	0.911	210	0.004	--

*Significant at 0.05 level

The table values required for being significant at 0.05 level of confidence with df -2 and 10, 5 and 10 were 3.04 and 2.26 respectively)

Table 3 shows that the obtained F- ratio for Groups within post test, first cessation, second cessation, third cessation and fourth cessation were120.223, 100.038, 43.063, 15.223 and 7.860 indicating that there was a significant difference between the paired means of groups within post test on 800 Meters Run.

Table 3 shows that F-ratio values obtained for tests within Aerobic Training Group and tests within Anaerobic Training Groups were 58.629 and 39.395 indicating that there was a significant difference exists among the paired means of tests within Aerobic Training Group and tests within Anaerobic Training Group on 800 Meters Run. Rest of the pairs is not significant.

Since, three groups and six different stages of tests were compared, whenever the obtained F-ratio value was found to be significant in the simple effect, the Scheffe's test was applied as post hoc test to find out the paired mean difference, if any and it has been presented in Table -4.

Table 4: The Scheffe's Test for the Differences between Paired Means of Tests on 800 Meters Run (Aerobic Training Group)

Pre Test	Post Test	First Cessation	Second Cessation	Third Cessation	Fourth Cessation	Mean difference	Confidence Interval
2.538	2.237					0.301*	0.081
2.538		2.281				0.257*	0.081
2.538			2.376			0.162*	0.081
2.538				2.475		0.063	0.081
2.538					2.537	0.001	0.081
	2.237	2.281				0.044	0.081
	2.237		2.376			0.139*	0.081
	2.237			2.475		0.239*	0.081
	2.237				2.537	0.301*	0.081
		2.281	2.376			0.095*	0.081
		2.281		2.475		0.195*	0.081
		2.281			2.537	0.257*	0.081
			2.376	2.475		0.099*	0.081
			2.376		2.537	0.161*	0.081
				2.475	2.537	0.062	0.081

*Significance at 0.05 level of confidence

Hence, the results of the study showed that there was a significant difference between pre test and post test values, pre test and first cessation values, pre test and second cessation values, post test and second cessation, post test and third cessation values, post test and fourth cessation values, first cessation and second cessation values, first cessation and third cessation values, first cessation and fourth cessation values, second cessation and third cessation values, second cessation and fourth cessation values on 800 Meters Run of Aerobic Training Group. It was also found that there was no significant difference between pre test and third cessation, pre test and fourth cessation values, post

test and first cessation values, third cessation and fourth cessation values on 800 Meters Run of Aerobic training Group.

Table 5: The Scheffe's Test for the Differences Between paired Means of Tests on 800 Meters Run (Anaerobic Training Group)

Pre Test	Post Test	First Cessation	Second Cessation	Third Cessation	Fourth Cessation	Mean difference	Confidence Interval
2.625	2.401					0.225*	0.081
2.625		2.392				0.233*	0.081
2.625			2.467			0.158*	0.081
2.625				2.540		0.085	0.081
2.625					2.633	0.007	0.081
	2.401	2.392				0.009	0.081
	2.401		2.467			0.067	0.081
	2.401			2.540		0.139*	0.081
	2.401				2.633	0.232*	0.081
		2.392	2.467			0.075	0.081
		2.392		2.540		0.148*	0.081
		2.392			2.633	0.241*	0.081
			2.467	2.540		0.073	0.081
			2.467		2.633	0.165*	0.081
				2.540	2.633	0.093*	0.081

* Significance at 0.05 level of confidence

The results of the study showed that there was a significant difference between pre test and post test values, pre test and first cessation values, pre test and second cessation values, post test and third cessation values, post test and fourth cessation values, first cessation and third cessation values, first cessation and fourth cessation values, second cessation and fourth cessation values, third cessation and fourth cessation values on 800 Meters Run of Anaerobic Training Group. It was also found that there was no significant difference between pre test and third cessation, pre test and fourth cessation values, post test and first cessation values, post test and second cessation, first cessation and second cessation values, second cessation and third cessation values, on 800 Meters Run of Anaerobic Training Group.

Discussion on Findings

The results of the study indicated that the experimental groups namely aerobic training and anaerobic training group had significantly influenced on the performance of 800 meters run as both experimental groups had undergone systematic training for twelve weeks duration. The control group had no significant improvement on the performance of 800 meters run as they have not subjected to any of the specific training similar to experimental groups. Hence it is understood that the selected training means had influence on the criterion variable. Further it is found that aerobic training group has significantly improved the selected dependent variables when compared to the anaerobic training group.

The findings of the study suggest that the aerobic training and anaerobic training group showed significant in the performance of 800 metres run. The result of the study is in consonance with Thompson and Rader (2001), Scmits, and Bachl (1991) and Hubinger, L.Mackinnon, Lt, (1996).

Conclusions
From the analysis of the data, the following conclusions were drawn:
1. All the experimental groups' namely Aerobic training and anaerobic training groups had achieved significant decrease in the performance of 800 Meters Run.
2. Significant differences were found among Aerobic training, and Anaerobic training groups towards improving the performance of 800 Meters Run.
3. It is concluded that, Aerobic Training Group is found to be better than Anaerobic Training and Control Group towards improving the performance of 800 Meters Run.
4. There was no significant reduction in the performance of 800 meters run during the first and second cessation of detraining period.
5. Significant reduction was found in the performance of 800 meters run during the third and fourth cessation of detraining period.

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