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Effect of six weeks aerobic training on aerobic power and tidal volume among football players

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Abstract

The purpose of the study was to find out the impact of six weeks aerobic training on aerobic power and tidal volume among football players. To achieve the purpose of these study thirty football players were selected from Chennai in the aged range between 18 to 25 years. The selected subjects were randomly assigned into two equal groups of 15 each, such as experimental and control group. The experimental group participated in the aerobic training for six weeks, training session last for thrice in a week, each section consist of 45minutes and the control group did not participate in any kind of special training programme apart from the daily physical activities. The selected variables such as aerobic power and tidal volume were measured by Margaria Kalamen Test (Watts) and Wet Spirometer (Litter). The subjects of two groups were tested on selected variables prior and immediately after the training period. The collected data were analysed statistically through analyze of covariance (ANCOVA) to find the significance difference. The 0.05 level of confidence was fixed to test the level of significance difference, the result of the study showed that systematic practice of six weeks aerobic training significance differences on aerobic power and tidal volume among football players.

Keywords: Aerobic training, aerobic power, tidal volume and football players

Introduction

Aerobic literally means "with oxygen", and refers to the use of oxygen in muscles' energy-generating process. Aerobic exercise includes any type of exercise, typically those performed at moderate levels of intensity for extended periods of time that maintains an increased heart rate. In such exercise, oxygen is used to "burn" fats and glucose in order to produce adenosine triphosphate, the basic energy carrier for all cells. Initially during aerobic exercise, glycogen is broken down to produce glucose, but in its absence, fat metabolism is initiated instead. The latter is a slow process, and is accompanied by a decline in performance level. The switch to fat as fuel is a major cause of what marathon runners call "hitting the wall." There are various types of aerobic exercise. In general, aerobic exercise is one performed at a moderately high level of intensity over a long period of time. For example, running a long distance at a moderate pace is an aerobic exercise. Training-induced adaptations in aerobic fitness have been extensively studied in adults, and some exercise scientists have recommended similar training programmes for young people. However, the subject of the response to aerobic training of children and adolescents is controversial. The effects of exercise training on prepubertal children are particularly debatable. The latter may be partly explained by different training designs, which make comparisons between studies very problematic (Baquet, G., Van Praagh, E., & Berthoin, S., 2003) [1]. Further Kostrzewska-Nowak, D., et al. (2015) [2] revealed that Twelve-week-long fitness training programme of two alternating styles (low and high impact) has a beneficial effect on overweight young women.

Methods

To achieve the purpose of the study thirty football players were selected from Chennai. The selected subjects age range from 18 to 25 years and they were divided into two equal groups of fifteen each in which the group I (n=15) underwent aerobic training for six weeks in thrice a day per week and group II (n = 15) acted as control which did not participate in any special training apart from their regular physical activity.

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For every training programme there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables such as cardiovascular endurance and tidal volume.

Training Programme

During the training period the experimental group (ATG) underwent 6 weeks of aerobic training programmes in addition to their daily routine activities as per the schedule. The duration of training were planned for 45 minutes that is from 7.00am to 7.45am on Mondays - two min running within the mod of high intensity followed by two min low intensity then active recovery repeated for 30min. Wednesdays- cycling for 30min and Fridays - jog for over the hills. All the subjects involved in this study were carefully monitored throughout the training programmes, Each session 45 minutes

training consist of 5 min warm up exercise, 30min aerobic training programme and finally end up with 10min cool down and stretching exercises for recovery purpose. After completion of 6 weeks of aerobic training period, the participants were retested as the pre-test.

Statistical Technique

The collected data were analysed statistically through analyze of covariance (ANCOVA) to find the significance difference.

Analysis of the Data

The data collected prior and after the experimental periods on aerobic power and tidal volume of aerobic training group and control group were analysed and presented in table – 1 & 2. The level of significance was fixed at 0.05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

Table 1: Analysis of Covariance for Pre and Post Data on Aerobic Power

Test	Aerobic Group	Control Group	Source of variance	Sum of Squares	df	Mean square	F
Pre-test mean	1.30	1.34	Between	.008	1	.008	0.51
			Within	0.417	28	.015	
Post-test mean	1.63	1.33	Between	0.69	1	0.69	71.71*
			Within	0.27	28	0.10	
Adjusted mean	1.64	1.32	Between	0.75	1	0.75	115.48*
			Within	0.17	27	0.07	

*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 2 and 28 and 2 and 27 were 3.34 and 3.35 respectively).

Discussion on Findings of Aerobic Power

The obtained F value on pre test scores 0.51 was lesser than the required F value of 3.34 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 71.71 was greater than the required F value at 3.34. This proved that the differences between the post-test mean at the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 115.48 was greater than the required F value at 3.35. This proved that there was Significant differences among the means due to six weeks of aerobic training on aerobic power.

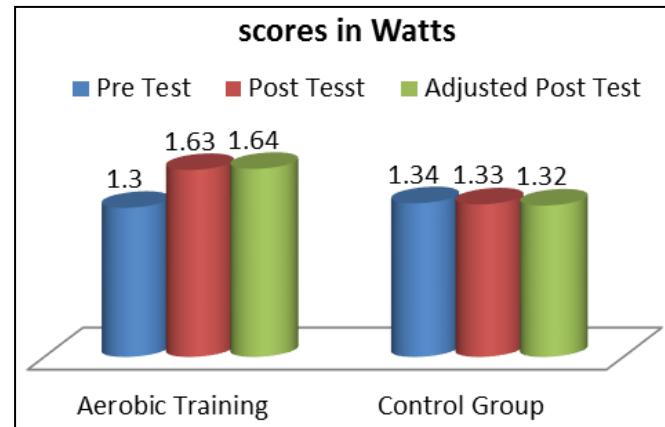


Fig 1: Bar Diagram showing Pre, Post and Adjusted Means on Aerobic Power

Table 2: Analysis of Covariance for Pre and Post Data on Tidal Volume

Test	Aerobic Group	Control Group	Source of variance	Sum of Squares	df	Mean square	F
Pre-test mean	2481.86	2467.13	Between	1628.03	1	1628.03	0.6
			Within	710425.46	28	25372.33	
Post-test mean	2593.0	2472.4	Between	109082.7	1	109082.7	4.61*
			Within	661529.6	28	23626.05	
Adjusted mean	2585.95	2479.44	Between	84900.72	1	84900.72	183.25*
			Within	12509.15	27	463.302	

*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 2 and 28 and 2 and 27 were 3.34 and 3.35 respectively).

Discussion on Findings of Endurance

The obtained F value on pre test scores 0.06 was lesser than the required F value of 3.34 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 4.61 was greater than the required F value

at 3.34. This proved that the differences between the post-test mean at the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 183.25 was greater than the required F value at 3.35. This proved that there was Significant differences among the means due to six weeks of aerobic training on tidal volume.

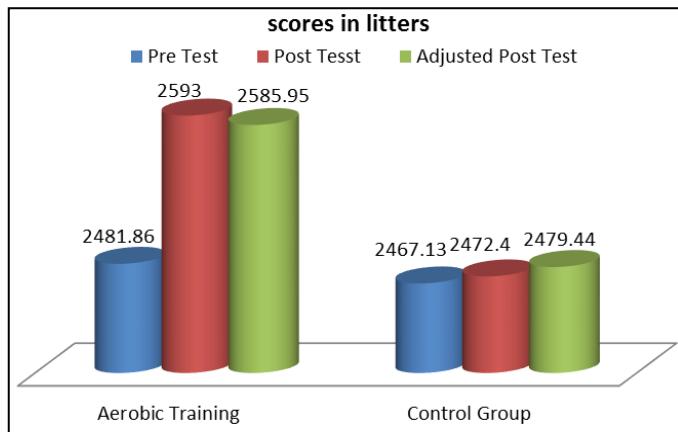


Fig 2: Bar Diagram showing Pre, Post and Adjusted Means on Tidal Volume

Conclusion

1. The selected criterion variable aerobic power was significantly increased due to six weeks of aerobic training among football players while comparing to the control group.
2. The selected criterion variable tidal volume was significantly increased due to six weeks of aerobic training among football players while comparing to the control group.

Reference

1. Baquet G, Van Praagh E, Berthoin S. Endurance training and aerobic fitness in young people. Sports medicine. 2003; 33(15):1127-1143.
2. Kostrzewska-Nowak D, Nowak R, Jastrzębski Z, Zarębska, A, Bichowska M *et al.* Effect of 12-week-long aerobic training programme on body composition, aerobic capacity, complete blood count and blood lipid profile among young women. Biochimia medica: Biochimia medica. 2015; 25(1):103-113.