Effects of Anaerobic and Aerobic Training on Overall Playing Ability Performance of Collegiate Football Players

Dr.M.Sooriyanarayanan[1] & Dr.K.Sundar[2]

[1]Physical Education Director, Anna University College of Engineering, Coimbatore. Tamilnadu, India.
[2]Physical Education Director, Anna University College of Engineering, Ramanathapuram. Tamilnadu, India.

Abstract

The purpose of the study was effects of anaerobic and aerobic training on Agility performances of collegiate football players.64 football men players from various colleges. The selected subjects were of age group ranging from 18 to 25 years. The subjects were randomly divided into four groups and each group consisted of 16 subjects. Group-I underwent isolated aerobic exercises, group-II was isolated anaerobic exercises, group-III was combination of aerobic and anaerobic exercises and group-IV act as control group was not given any special treatment. The experimental period was 12 weeks. Pre-test and posttest were taken before and after the training programme. The selected physical variables were agility. During the intervention phase, a modified training program was offered by a well-trained football couches to the experimental group under the supervision of the researcher at a college in India. All participants were encouraged to continue their standard physical activities and routine procedures. The intervention phase 12 weeks and included morning 60 minutes and evening 60 minutes football couching classes for alternative days in a week. To find out the significant effects of aerobic and anaerobic training on selected physical variable. The ANCOVA statistical technique was used to find the mean difference between the groups on physical variables. The results of the study revealed a significant group × test interaction (p < 0.05). Follow-up analyses indicated that while no group differences in physical variables existed between the four groups of the pre-test. In posttest all the experimental groups were found to have significantly (p < 0.05) better performance on the physical variables than the control group. The findings of the present study suggest that combined effects of anaerobic and aerobic training improved the physical variables in collegiate football players.

Keywords: Aerobic, Anaerobic, Football, Agility, Inter-Collegiate.

Introduction

Sports are integral part of the system of education. Training is a system of process in which football players improve their fitness to meet the demands of their sport. Training uses both general and specific exercises to develop the football player for their sport. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. The major benefits of aerobic trainings are stronger and more efficiently operating the football players heart and lungs. Anaerobic energy is produced without the use of oxygen. The anaerobic energy system can provide great amounts of energy but this system fatigues quickly. People participating in speed or power events like football, hockey and basketball are very familiar with this form of energy production. Football is also referred to as soccer in some parts of the world, is a high-energy athletic team sport in this new age. The game, as we know it today, has been followed in a feverish fashion in Europe, especially in England, for centuries. In fact, the game has been followed by men and women throughout the world. The first recorded game took place as early as A.D. 217 in the town of Derby in England. This particular game was once part of a grand festival that was celebrated by the local folk after the victory over the invading Romans. (**Morris, 1981).**

Methodology

To achieve the purpose of the present study, 64 men football players were selected from Tamil Nadu colleges, who had participated in the inter-collegiate level tournaments. They were selected at random as subjects. All the subjects were residents of Tamil Nadu state and they had a similar academic work and regular activities in accordance with the requirements of their college curriculum. The selected subjects were of age group ranged from 18 to 25 years. The subjects were randomly divided into four groups and each group consisted of 16 subjects. Group-I underwent aerobic training, group-II underwent anaerobic training, group-III underwent combined aerobic and anaerobic training and group IV as control group. The study was conducted 12 weeks training schedule. Agility was selected as a

Correspondence
Dr.M.Sooriyanarayanan,
E-mail: manisooriya@gmail.com, Ph: +919994348109

dependent variable and it was tested through 10 meters Shuttle run test. Pre test-post test-random group-research design was followed in this study.

To find out the significant effects of aerobic and anaerobic training on selected agility, analysis of covariance (ANCOVA) was computed for the data collected aerobic, anaerobic, combined and control groups during pretest and posttest separately for each variable. Further to state, since four groups were involved, whenever the F ratio was significant, Scheffe's

post hoc test was used determine which of the paired mean differed significance 0.05 was fixed.

Results and Discussion

The statistical analysis comparing the initial and final means of agility due to effect of anaerobic and aerobic training on selected physical fitness variable namely, agility among collegiate football players is presented in Table I.

Table I. Computation of analysis of covariance of agility

	Aero-bic	Anae-robic	Com-bined	Control	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre Test Mean	13.05	12.96	13.01	12.9	Between	0.36	3	0.12	1.68
					Within	5.45	76	0.07	
Post Test Mean	12.89	12.76	12.70	12.9	Between	0.53	3	0.18	2.86*
					Within	4.73	76	0.06	
Adjusted Post Test Mean	12.83	12.77	12.66	13.0	Between	0.87	3	0.29	17.75*
					Within	1.23	75	0.02	
Mean Diff	-0.16	-0.20	-0.31	0.01					

Table F-ratio at 0.05 level of confidence for 3 and 76 (df) =2.73, 3 and 75(df) =2.73 .*Significant

As shown in Table I, obtained F ratio of 1.68 on pre test means of the groups is not significant at 0.05 levels. This shows that there is no significant difference among the means of the groups at the initial stage and hence the random assignment of the groups is successful. The obtained F ratio on post test means is 2.86, and is significant at 0.05 level, being greater than the required F value of 2.73 to be significant at 0.05 level. Taking into consideration the pre test means and

post test means, adjusted post test means are determined and analysis of covariance is done and the obtained F value 17.75 is greater than the required value of 2.73 and hence it is accepted. This shows that there are significant differences among the adjusted means on the collegiate football players. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results are presented in Table II.

Table II. Scheffe's confidence interval test scores on agility

Aerobic	Anaerobic	Combined	Control Group	MEAN DIFF	C.I
12.83	12..77			0.16*	0.12
12.83		12.66		0.06	0.12
12.83			12.96	0.13*	0.12
	12.77	12.66		0.10	0.12
	12.77		12.96	0.29*	0.12
		12.66	12.96	0.19*	0.12

* Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means prove that (1) there are significant differences between aerobic and anaerobic training groups (2) aerobic and control group (3) anaerobic and control group and (4) combined and control group. It is found that (1) there was no significant difference

between aerobic and combined group (2) there was no significant difference between anaerobic and combined training. The ordered adjusted means are presented through bar diagram for better understanding of the results of this study in Figure I.

Figure I. Bar diagram on ordered adjusted means of agility
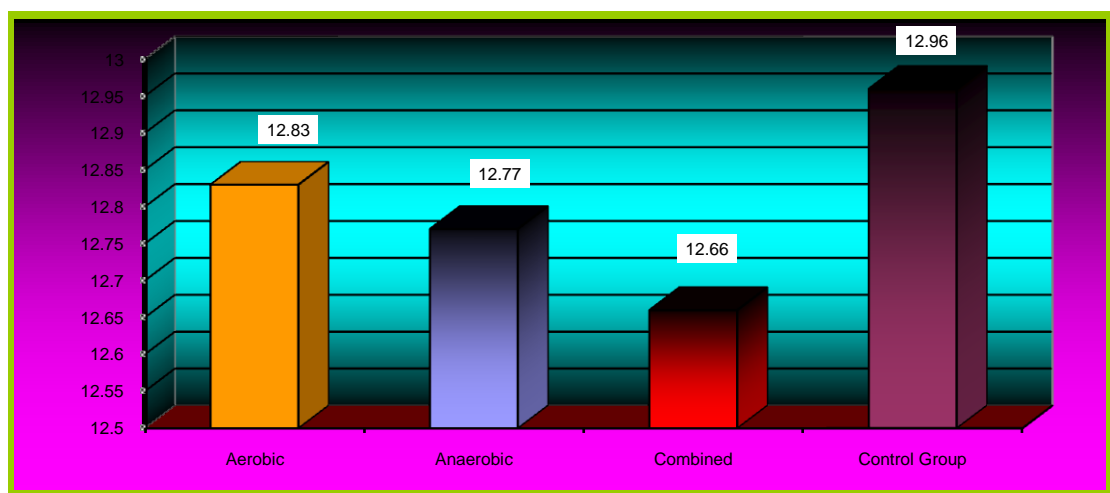
Discussions on Findings

As shown in Table I, the obtained F value on the scores of pre test means (1.68) is less than the required F value, which proves that the random assignment of the subjects were successful and their scores in agility before the training were equal and there were no significant differences. Taking into consideration the pre test means and post test means, adjusted posttest means are determined and analysis of covariance is done and the obtained F value 17.75 is greater than the required value of 2.73 and hence it is accepted. This shows that the interventional programmes significantly improve agility of the collegiate football players. The post hoc analysis of obtained ordered adjusted means prove that there are significant differences between (1) anaerobic group and control group (2) combined group and control group and (3) aerobic group and control group.

Comparing between the treatment groups, it is found that (1) there are significant differences between anaerobic group and aerobic group and (2) there are no significant differences between combined group and aerobic group and combined group and anaerobic group. Thus, it is proved that while aerobic, anaerobic group and combined group improve agility of the college boxers compared to control group, anaerobic group is better than aerobic group in improving agility of the collegiate football players and the differences are significant at 0.05 levels.

Bames Schilling and Falvo (2007) found large magnitude of differences on jumping and agility performance among different categories of athletes and agility covers 34% of the variance of performance. Under the twelve weeks aerobic, anaerobic and combined training the subjects were induced to exert more energy and training themselves. As the subjects continued with the additional aerobic power, the agility began to stabilize. The findings proved that the twelve weeks anaerobic and combined training had significant influence in improving agility of the football players. The finding of this study is in agreement with the findings of Bames Schilling and Falvo (2007) who found significant improvement in run time, agility and improved performance due to frequent training protocol.

Conclusions

1. It is concluded that isolated and combined effect of aerobic and anaerobic training significantly improve agility of the college football men players.
2. The comparing among the treatment groups, the combined aerobic and anaerobic training would be better than isolated groups, aerobic and anaerobic training on agility of collegiate men football players.

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