

# Variations between with and without ball aerobic trainings on selected physiological variables among football players

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Received : July, 2011; Revised : August, 2011; Accepted : September, 2011

## ABSTRACT

The purpose of the study was to find out the difference between with and without ball aerobic trainings on selected physiological variables among football players. To achieve this purpose of the study, 45 men football players were selected from Department of Physical Education and Sports Sciences, Annamalai University, Tamil nadu, India at randomly. They were divided into three equal groups of fifteen players each namely, aerobic training with ball group and aerobic training without ball group and control group. The group I performed aerobic training with ball, group II performed aerobic training without ball and group III acted as control who did not undergo any special training programme apart from their regular physical education curriculum. Group I and II were underwent their respective training programme for three days per week for twelve weeks. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme. Analysis of covariance (ANCOVA) was used to find out the significant differences if any, among the groups on each selected criterion variables separately. The results of the study revealed that there was a significant difference between aerobic training with ball group and aerobic training without ball group and control group on selected criterion variables such as  $VO_2^{\max}$  and forced expiratory volume. And there was a significant improvement as selected criterion variables namely  $VO_2^{\max}$  and forced expiratory volume such to aerobic training with ball and aerobic training without ball training.

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Kumar, G. Suresh , Arul, S. and Karthikeyan, P. (2011). Variations between with and without ball aerobic trainings on selected physiological variables among football players. *Internat. J. Phy. Edu.*, 4 (1) : 151-154.

**Keywords:** Variation, Ball aerobic training, Foot ball players

The aerobic system is the main source of energy provision during soccer match-play (Bangsbo, 1993). This is indicated both by measurements of physiological responses during games and by the metabolic characteristics of soccer players' muscles. The upper limit of the body's ability to consume oxygen is indicated by the maximum oxygen uptake or  $VO_2^{\max}$ . The  $VO_2^{\max}$  which represents an integrated physiological function with contributions from lungs, heart, blood and active muscles.

Aerobic refers to a variety of exercises that stimulate heart and lung activity for time period sufficiently long to produce beneficial changes in the body. Aerobics basically means living or working with oxygen. Aerobics or endurance exercises are those in which large groups are used in rhythmic repetitive fashion for prolonged periods of time. Running, swimming, cycling and jogging are typical exercises. Aerobic exercise means the exercise where all body parts muscles are supplied with enough oxygen with the increased heart rate.

Football is played as well as enjoyed by multitudes of people all over the globe. This is one of the most

recognized sports. Football acquired popularity among the Indian masses within a short period of time and is the popular as well as widely played Indian sports. Although the modern game of football had emerged in England, in its primitive form, it had undoubtedly been played for centuries in other countries which claim that the game had been played in their countries from very ancient time, Soccer the game evokes an out pouring passion and emotion unparalleled within the realm of sport (Roy, 1994).

## METHODOLOGY

The purpose of the study was to find out the difference between with and without ball aerobic trainings on selected physiological variables among football players. To achieve the purpose of the study, 45 men football players were selected from Department of Physical Education and Sports Sciences, Annamalai University, Tamil nadu, India at randomly. They were divided into three equal groups of fifteen players, each namely aerobic training with ball group and aerobic training without ball group and control group. The group I performed aerobic

training with ball, group II performed aerobic training without ball and group III acted as control who did not undergo any special training programme apart from their regular physical education curriculum. Group I and II were underwent their respective training programme for three days per week for twelve weeks.

The following physiological variables such as  $Vo_2^{max}$  and forced expiratory volume were selected as criterion variables. The  $Vo_2^{max}$  was assessed by treadmill test and forced expiratory volume was assessed by using computerized wet spirometer. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme. Analysis of covariance (ANCOVA) was used to find out the significant differences if any, among the groups on each selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate.

During the training period, group I performed aerobic training with ball, group II performed aerobic training without ball programme, for three days per week for twelve weeks in addition to their regular physical education activity, every day workout lasted about 40-60 minutes including warm-up and cooling down exercises. Group III acted as control who did not participate any special training. However, they performed regular physical education activities as for their curriculum.

**OBSERVATIONS AND DISCUSSION**

The analysis of covariance of the data obtained for  $Vo_2^{max}$  of pre-test and post-test of aerobic training with ball group and aerobic training without ball group and control group have been presented in Table 1.

Table 1 shows that the adjusted post-test means on  $Vo_2^{max}$  of aerobic training with ball group and aerobic training without ball group and control group were 39.99,

38.87 and 37.94, respectively. This obtained 'F' ratio value 197.37 for adjusted post-test was greater than the required table value 3.23 for 2 and 41 at .05 level of confidence on  $Vo_2^{max}$ .

The results of the study indicated that there was a significant difference between the adjusted post-test means of aerobic training with ball group and aerobic training without ball group on  $Vo_2^{max}$ . Since three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences has been presented in Table 2.

**Table 2: The scheffe's test for the difference between paried means on  $Vo_2^{max}$**

Aerobic training with ball group	Aerobic training without ball group	Control group	Mean differences	Confidence interval value
39.99	38.87	-	1.12*	0.25
39.99	-	37.94	2.05*	0.25
-	38.87	37.94	0.93*	0.25

\*indicates significance of value at P=0.05

Table 2 shows that the mean difference values between aerobic training with ball group and aerobic training without ball group and control group were 1.12, 2.05 and 0.93, respectively on  $Vo_2^{max}$  which were greater than the required confidence interval value of 0.25 significance.

The results of this study showed that there was a significant difference between aerobic training with ball group and aerobic training without ball group and control group and aerobic training without ball group and control group on  $Vo_2^{max}$ .

The analysis of covariance of the data obtained for forced expiratory volume of pre-test and post-test of

**Table 1: Analysis of covariance for the pre and post test on  $Vo_2^{max}$  aerobic training with ball group and aerobic training without ball group and control group**

Test	Aerobic training with ball group	Aerobic training without ball group	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained 'F' ratio
Pre-test								
Mean	37.99	37.77	38.05	Between	0.65	2	0.32	1.34
S.D	0.53	0.57	0.35	Within	10.26	42	0.24	
Post-test								
Mean	40.02	38.77	38.01	Between	31.08	2	15.54	99.61*
S.D	0.34	0.54	0.24	Within	6.56	42	0.15	
Adjusted post-test								
Mean	39.99	38.87	37.94	Between	31.59	2	15.79	197.37*
				Within	3.31	41	0.080	

\* Significant at .05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.23, respectively).

**Table 3: Analysis of covariance for the post test on forced expiratory volume aerobic training with ball group and aerobic training without ball group and control group**

Test	Aerobic training with ball group	Aerobic training without ball group	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained 'F' ratio
Pre-test								
Mean	3.42	3.37	3.43	Between	0.039	2	0.019	0.32
S.D	0.69	0.76	0.31	Within	2.53	42	0.060	
Post-test								
Mean	3.87	3.58	3.44	Between	1.44	2	0.72	12.00*
S.D	0.68	0.28	0.14	Within	2.55	42	0.060	
Adjusted post-test								
Mean	3.82	3.56	3.39	Between	0.54	2	27	771.4*
				Within	1.44	41	0.035	

\* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.23, respectively).

aerobic training with ball group and aerobic training without ball group and control group have been presented in Table 3.

Table 3 shows that the adjusted post-test means on forced expiratory volume of aerobic training with ball group and aerobic training without ball group and control group were 3.82, 3.56 and 3.39, respectively. This obtained 'F' ratio value 771.4 for adjusted post-test was greater than the required table value 3.23 for 2 and 41 at 0.05 level of confidence on forced expiratory volume.

The results of the study indicated that there was a significant difference between the adjusted post-test means of aerobic training with ball group and aerobic training without ball group and control group. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences is presented in Table 4.

**Table 4: The scheffe's test for the difference between paired means on forced expiratory volume**

Aerobic training with ball group	Aerobic training without ball group	Control group	Mean differences	Confidence interval value
3.82	3.56	-	0.26*	0.17
3.82	-	3.39	0.43*	0.17
-	3.56	3.39	0.17*	0.17

\*indicates significance of value at P=0.05

Table 4 shows that the mean difference values between aerobic training with ball group and aerobic training without ball group, control group were 0.26, 0.43 and 0.17, respectively on forced expiratory volume which were greater and equal to than the required confidence

interval value of 0.17 significance.

The results of this study showed that there was a significant difference between aerobic training with ball group and aerobic training without ball group, aerobic training with ball group and control group and aerobic training without ball group and control group on forced expiratory volume.

**Conclusion:**

The following conclusions were drawn based on the analysis of the study,

- There was a significant difference among aerobic training with ball and aerobic training without ball and control group on  $Vo_2^{max}$ .
- There was a significant difference among aerobic training with ball and aerobic training without ball and control group on forced expiratory volume.
- There was a significant improvement on selected criterion variables such as  $Vo_2^{max}$  and forced expiratory volume due to aerobic training with ball and aerobic training without ball programmes.
- The improvement on  $Vo_2^{max}$  and forced expiratory volume was in favour for aerobic training with ball group than aerobic training without ball group.

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