

**INVESTIGATION OF THE CHANGES ON REACTION TIME AND ANAEROBIC
POWER OF FOOTBALL PLAYERS DUE TO LOW AND HIGH FREQUENCY
AEROBIC INTERVAL TRAINING**

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Abstract

The purpose of the study is to find out the investigation of the changes on reaction time and anaerobic power of football players due to low and high frequency aerobic interval training. To achieve the purpose of the study forty five male football players were selected from Altius International Football Academy, Palakkad, Kerala, India, were selected as subjects. The subjects were selected in the age group of 15 to 18 years. Forty five subjects were selected at random and subjects were divided into three equal groups designed two experimental group and the other control group. Thus each group consisted of 15 subjects. Experimental group-I was given the packages of low frequency aerobic interval training (3days/week), experimental group-II was given the packages of high frequency aerobic interval training (6days/week) and group III was acted as control. Each subject was oriented in the procedure to the administration of the test. Prior to and after the exercises period the subjects were tested for, reaction time and anaerobic power measured by reaction time ruler test and running-based anaerobic sprint test. The statistical tool were used for the present study is ANACOVA. Further to determine which of the paired means has significant improvement, Scheffe's test was applied as Post-Hoc Test. The result of the study was a significant increase on reaction time and anaerobic power after twelve weeks of low and high frequency aerobic interval training. However the increase was favour of experimental group. There was a significant difference was occurred between experimental and control groups after twelve weeks of low frequency aerobic interval training.

Keywords:- Aerobic interval training, Reaction time, Anaerobic power and Football

INTRODUCTION

Aerobic interval training is good training plan for improving aerobic fitness, without side effects on strength, power and sprint performance. In enhancing aerobic fitness and football-specific endurance using aerobic interval training, both exercises (specific or generic) is equally effective. Effective training strategy for developing aerobic fitness in football players can be considered with high intensity aerobic interval training (Ferrari et al., 2008). A large number of studies have evaluated the physical demands of a football game and the effects of fitness training on football players.

Aerobic training causes the heart and lungs to work harder. Effective weight loss is possible with moderate intensity aerobic workout rather than short-term and high intensity activities such as sprints. An aerobic workout trains one's lungs to process more air with less effort and one's heart to pump more blood with fewer beats.

Football is a demanding sport. Not only the football player must have tremendous cardiovascular endurance to run up and down the court time after time for four quarters of play, but he will also need to be able to execute explosive bursts of speed, explosive jumps, and explosive movements for agility, time after time. Such an ability to perform explosively regardless of extreme cardiovascular fatigue is called "strength-endurance". Explosive power, one of the most important components of performance related factors, helps the player to move fast, jump high, and beat out the man in front of him. Football is no longer just a game of shooting baskets and dribbling the ball around opponents.

Reaction time is the interval time between the presentation of a stimulus and the muscular response initiation to that stimulus. Reaction time, in physical fitness, is the time needed to respond consciously to an external stimulus. An important thing to note here is that reaction time must not be confused with reflexes. Reflexes are involuntary.

Anaerobic Power is work capacity created when our muscles use aerobic energy system in exercises at maximal and supramaximal levels is referred to anaerobic capacity. Anaerobic power is defined as a value of this work per unit time (kgm/sec, kgm/min, watt).

STATEMENT OF THE PROBLEM

The purpose of the present investigation was to examine the changes on reaction time and anaerobic power in response to different frequencies of aerobic interval training among football players.

METHODOLOGY

The purpose of the study is to find out the investigation of the changes on reaction time and anaerobic power of football players due to low and high frequency aerobic interval training. To achieve the purpose of the study forty five male football players were selected from Altius International Football Academy, Palakkad, Kerala, India, were selected as subjects. The subjects were selected in the age group of 15 to 18 years. Forty five subjects were selected at random and subjects were divided into three equal groups designed two experimental group and the other control group. Thus each group consisted of 15 subjects. Experimental group-I was given the packages of low frequency aerobic interval training (3days/week), experimental group-II was given the packages of high frequency aerobic interval training (6days/week) and group III was acted as control. Each subject was oriented in the procedure to the administration of the test. Prior to and after the exercises period the subjects were tested for, reaction time and anaerobic power measured by reaction time ruler test and running-based anaerobic sprint test. The statistical tool were used for the present study is ANACOVA. Further to determine which of the paired means has significant improvement, Scheffe's test was applied as Post-Hoc Test. The result of the study was a significant increase on reaction time and anaerobic power after twelve weeks of low and high frequency aerobic interval training. However the increase was favour of experimental group. There was a significant difference was occurred between experimental and control groups after twelve weeks of low frequency aerobic interval training.

ANALYSIS AND INTERPRETATION OF DATA

The data collected prior to and after the experimental periods on reaction time and anaerobic power on low and high frequency aerobic interval training and control group were analyzed and presented in the following table -I.

Table-I

Analysis of covariance for reaction time and anaerobic power on low and high frequency aerobic interval training and control group

Variable Name	Group Name	Control group	Low frequency group	High frequency group	F ratio
Reaction time	Pre-test Mean ± S.D	0.32 ± 0.05	0.31 ± 0.04	0.30 ± 0.04	0.656
	Post-test Mean ± S.D.	0.31 ± 0.04	0.28 ± 0.04	0.24 ± 0.03	8.543*
	Adj. Post-test Mean ± S.D.	0.31	0.28	0.25	15.628*
Anaerobic power	Pre-test Mean ± S.D	224.00 ± 5.55	223.60 ± 5.56	223.13 ± 4.58	0.436
	Post-test Mean ± S.D.	224.20 ± 4.90	232.73 ± 5.77	244.26 ± 8.48	11.65*
	Adj. Post-test Mean ± S.D.	224.02	232.72	244.45	40.018*

* Significant at 0.05 level of confidence (The table value required for significance at .05 level of confidence with *df* 1 and 43 and 1 and 42 were 3.21 and 3.22 respectively)

Table - I showed that the results of the study there was a significant difference found between low and high frequency aerobic interval training and control group on reaction time and anaerobic power. Further the results of the study showed that there was a significant improvement on reaction time and anaerobic power due to twelve weeks of programme. However the improvement was in favour of experimental groups. The results of the study also shown that high frequency aerobic interval training was better than low frequency aerobic interval training and control group on reaction time and anaerobic power. Further to determine which of the paired means has a significant improvement, Scheffé *S* test was applied as post-hoc test. The result of the follow-up test is presented in Table – II

Table – II

Scheffé S test for the difference between the adjusted post-test mean of reaction time and anaerobic power on low and high frequency aerobic interval training and control group

Adjusted post-test mean of reaction time				
Low frequency group	High frequency group	Control Group	Mean Difference	Confidence interval at .05 level
0.28	0.25		0.03*	0.02
0.28		0.31	0.03*	0.02
	0.25	0.31	0.06*	0.02
Adjusted post-test mean of anaerobic power				
232.72	244.45		11.73*	5.80
232.72		224.02	8.70*	5.80
	244.45	224.02	20.43*	5.80

* Significant at 0.05 level of confidence.

Both low and high frequency aerobic interval training improves reaction time and anaerobic power when compare with control. High frequency aerobic interval training may have better effect to improves reaction time and anaerobic power of male football players.

CONCLUSIONS

Within the limitations and delimitations of this study the following conclusions were drawn from the result.

1. It was concluded that there was significant improvement in reaction time among football players due to low and high frequency aerobic interval training. MonikaGarg et al., (2013) determined the effect of aerobic exercise on auditory reaction time (ART) and visual reaction time (VRT). They found that auditory and visual reaction times are better in aerobic exercisers as compared to non-exercisers irrespective of age and gender. Similar results regarding the positive effect of exercise on RT time have been reported previously (Levitt & Gutin, 1971; Nakamoto & Mori, 2008; Parekh et al., 2004). In one study faster RTs for both auditory and visual stimuli were reported among aerobic exercisers compared to controls (Nakamoto & Mori, 2008).

2. The result of the study reveal that low and high frequency aerobic interval training would improve football players anaerobic power significantly. MacDougall et al., (1996) found that, relatively brief period of sprint training increased aerobic and anaerobic capacities in initially untrained individuals. These results are in agreement with the previous observation by Wenzel (1992) and Nowberry & flowers (1999) in which they found significant improvement in anaerobic power following speed training. Medbo and Burgers (1990) reported that, six weeks of intense exercise of short duration improved anaerobic capacity.

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