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## Influence of aerobic and anaerobic interval training compared with yogic practices on selected physical fitness variables of high school football players

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**Abstract:** The aim of this study was to determine whether aerobic interval training with yogic practices (AeIYG) or anaerobic interval training with yogic practices (AnIYG) has greater effect on selected physical fitness variables, speed and agility among high school football players. For this purpose, the investigator selected find out the influence of aerobic and anaerobic interval 90 football players divided into three groups, namely, AeIYG, AnIYG and control group (CG). The subjects were tested for speed and agility initially and after 12 weeks of experiment on respective training on the subjects. The results proved that there was significant improvement in speed ( $F: 45.52$ ) and agility ( $F 8.37$ ) on adjusted means, against required  $F$  value of 3.1. The post hoc analysis proved that AeIYG was better than CG and AnIYG in improving speed and agility of school level football players. It was concluded that aerobic interval training with yogic practices significantly improved speed and agility of the school level football players than anaerobic power with yogic practices.

**Keywords:** Aerobic Interval training with Yogic Practices, Anaerobic Interval training with Yogic Practices, Speed, Agility

## INTRODUCTION

Aerobic can be viewed as an intricate system of bodily supply and demand. That is the body needs energy for any kind of activity and the need is filled by burning off the foods that eat. The majority medical opinion is that aerobic programs strengthen heart muscle, increase the efficiency of lungs and offer other wonderful benefits.

Anaerobic training is used to increase strength and power through intense muscular activity. The muscles generate energy by converting glucose into lactic acid. But because of the strenuous nature of the activity and the fact that oxygen is not needed, this sort of exercise can only be maintained for short periods of time. Oxygen only comes into play after the exercise, when it is needed for recovery and metabolism of glucose to supply more energy. This is why resting time is crucial to maintain a successful session of anaerobic training. The most popular form of anaerobic training among soccer players is interval training. This is basically sessions of high-speed / high-intensity exercise followed by periods of rest or low activity. The idea is to develop strength through short bursts of speed in a variety of actions such as stopping, turning, and directional changes in the game of football.

Actually, one could think of a game of football as one long bout of interval training

Yoga makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. Yoga is a re-education of one's mental process, along with the physical (Sharma, 1984). Yoga helps to develop all system of human body such as cardiovascular, respiratory, digestive, eliminative, endocrine, nervous and muscle-skeletal system thus strengthening, cleansing and purifying the body so that it is brought under our conscious will (Iyengar, 2001).

Chandler (1994) found that a properly initiated sport specific aerobic conditioning program is essential for maximal performance to be reached in most any sport. Gopinath (2008) examined the effects of aerobics with 20 minutes rest period and found no significant changes in selected biochemical variables. Selvalakshmi (2007) conducted a study on effect of varied aerobic training programme and found significant improvement in cardiorespiratory parameters. Uppal (1990) conducted a study on determine the effects of interval training and two continuous load methods on cardio respiratory parameters and found slow the continuous and fartlek method result significantly higher improvements in cardio respiratory endurance when compared to interval training. Bacharach and Davillard (2004) examined a study of intermediate and a long term anaerobic performance of elite Alpine skiers and found that capacity of anaerobic power can be altered. Madanmohan et al. (2000) studied the effects of yoga training on cardiovascular response to exercise concluded that after yoga training a given level of exercise leads to a milder cardiovascular response, suggesting better exercise tolerance.

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Ray et al. (2001) found improvement in performance at submaximal level of exercise and in anaerobic threshold, shoulder, hip, trunk and neck flexibility improved in the yoga group. Thus, the researches reviewed proved different effects on selected physical parameters of sports men due to aerobic interval training, anaerobic interval training and yogic practices. There was scarcity of researches in finding out 'aerobic interval training with yogic practices' (AeIYG) and anaerobic interval training with yogic practices (AnIYG) on selected physical fitness parameters, speed and agility of the school level football players.

## METHODS

The subjects (n=90) were randomly assigned to three equal groups of thirty male higher secondary school football players. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on selected physical, such as speed and agility. The experimental groups participated in their respective

aerobic interval training combined with yogic practices and anaerobic interval training combined with yogic practices for a period of 12 weeks. The post tests were conducted on the above said dependent variables after experimental period. The differences between initial and final means on selected variables were considered as the effect of experimental treatment. Statistical tool Analysis of Covariance (ANCOVA) was used to determine the significance of the means for each variable. Post hoc analysis was made using Scheffe's test when obtained F value was significant. In all cases 0.05 level was fixed to test the hypothesis of this study.

## RESULTS

Analysis of the treatment effects, namely, Aerobic interval training with Yoga practices (AeIYG), Anaerobic interval training with Yoga practices (AnIYG) and control group (CG) on speed were presented in tables I and II, and on agility were presented in tables III and IV.

Table I: ANALYSIS OF COVARIANCE ON SPEED AMONG AEROBIC INTERVAL TRAINING WITH YOGIC PRACTICES, ANAEROBIC INTERVAL TRAINING WITH YOGIC PRACTICES, AND CONTROL GROUP  
(Scores in Seconds)

	Aerobic with Yoga	Anaerobic with Yoga	Control	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	8.53	8.72	8.14	Between	5.27	2	2.64	1.31
				Within	175.66	87	2.02	
Post Test Mean	7.43	8.35	8.07	Between	13.26	2	6.63	3.95*
				Within	146.12	87	1.68	
Adjusted Post Test Mean	7.38	8.13	8.35	Between	15.65	2	7.82	45.52*
				Within	14.78	86	0.17	
Mean Diff	-1.09	-0.37	-0.06					

Required F table value (df 2,86) = 3.10 at 0.05 level.

\* Significant

Since significant F ratios were obtained, the results were further subjected to post hoc analysis using Scheffe's test and

results presented in Table II.

Table II: Scheffe's Confidence Interval Test Scores on Speed

Aerobic with Yoga	Anaerobic with Yoga	Control	MEAN DIFF	Reqd. C.I
7.38	8.13		0.75*	0.28
7.38		8.35	0.98*	0.28
	8.13	8.35	0.23	0.28

\* Significant

Table III: ANALYSIS OF COVARIANCE ON AGILITY AMONG AEROBIC INTERVAL TRAINING WITH YOGIC PRACTICES, ANAEROBIC INTERVAL TRAINING WITH YOGIC PRACTICES, AND CONTROL GROUP  
(Scores in Seconds)

	Aerobic with Yoga	Anaerobic with Yoga	Control	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	8.92	8.86	8.93	Between	0.08	2	0.04	0.62
				Within	5.38	87	0.06	
Post Test Mean	8.36	8.63	8.94	Between	4.99	2	2.49	7.56*
				Within	28.71	87	0.33	
Adjusted Post Test Mean	8.35	8.67	8.92	Between	4.86	2	2.43	8.37*
				Within	24.99	86	0.29	
Mean Diff	-0.56	-0.23	0.01					

Required F table value (df 2,86) = 3.10 at 0.05 level.

\* Significant

Since significant F ratios were obtained, the results on agility were further subjected to post hoc analysis using

Scheffe's test and results presented in Table IV

Table IV: Scheffe's Confidence Interval Test Scores on Speed

Aerobic with Yoga	Anaerobic with Yoga	Control	MEAN DIFF	Reqd. C.I
8.35	8.67		0.32	0.35
8.35		8.92	0.57*	0.35
	8.67	8.92	0.25	0.35

\* Significant

## DISCUSSIONS

The game of football itself is a long bout of interval training. Every football player is expected to improve the physical fitness levels continuously to keep on their performances are improved. There are different methods the players adopt to maintain and improve the physical capacities such as aerobic, anaerobic, fartlek, circuit training, interval training and so on. Apart from these trainings, yogic practices are being considered as an indispensable additional training input for every athlete, as it contributes for physical, physiological and psychological improvements. While it was found that interval training method is found to be the best one for improving the physical capacities continuously, the research interest of this study is to find out whether a combination of aerobic interval training with yogic practices or anaerobic interval training with yogic practices significantly improves selected physical fitness parameters, speed and agility of school football players.

The results of this study proved that speed of the school football players was significantly improved due to 12 weeks of AeIYG and AnIYG as the obtained F value of 45.52 on adjusted means was greater than the required table F value of 3.1 (Table I). The post hoc analysis proved that there was significant difference between AeIYG and CG and there was no significant difference between AnIYG and CG. The comparison between the treatment groups proved that AeIYG was better than AnIYG in improving school level football players' speed (Table II).

The results of this study proved that agility of the school football players was significantly improved due to 12 weeks of AeIYG and AnIYG as the obtained F value of 8.37 on adjusted means was greater than the required table F value of 3.1 (Table III). The post hoc analysis proved that there was significant difference between AeIYG and CG and there was no significant difference between AnIYG and CG. The comparison between the treatment groups also proved that there was no significant difference among school level football players' agility (Table IV).

Aerobic interval training consists of physical exercises that last more than 6 minutes and each yogic practice performed by the subjects lasted more than 3 minutes, and anaerobic interval training consists of short bouts, less than 2 minutes. Thus, the aerobic interval training protocol helped the school football players to get adequate energy sources from muscle glycogen and fatty acids whereas in the case of anaerobic interval training with yogic practices, the energy path ways are from ATP (Adenosine Triphosphate – ATP in

muscles). Thus, in anaerobic interval training, the actively contracting muscles obtain ATP from glucose stored in the blood stream and the breakdown of glycogen stored in the muscles and aerobic interval training from muscle glycogen and fatty acids, which helps the football players to have speed and agility effects for longer periods than anaerobic training. This resulted in the better performance by AeIYG than AnIYG in this study. The results of this study are in agreement with the findings of Chandler (1994), Gopinath (2008) and Selvalakshmi (2007) who found significant improvement in cardiorespiratory parameters due to aerobic training.

## CONCLUSIONS

It was concluded that aerobic interval training with yogic practices significantly improved speed and agility of the school level football players than anaerobic power with yogic practices.

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