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## Combined effects of aerobic and anaerobic training on speed among hockey players

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### Abstract

The purpose of this study was to find out the combined effect of aerobic and anaerobic training on speed among hockey players. To achieve the purpose of the study, 60 male hockey players who played at district level were selected from Tirunelveli district, Tamil Nadu, India. The selected subjects were randomly assigned in to four groups of (n=15) each, such as experimental and control groups. Experimental group I served as aerobic training group, Group - II, served as anaerobic training, Group III served as combined aerobic and the group IV served as control group. The pre and post test randomized control group design was used as experimental design. The collected data from the four groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with dependent 't' test to find out the significant improvement between pre and post test means of the both groups and analysis of co variance (ANCOVA) was used to find out the significant difference between experimental and control groups.

**Keywords:** Training, aerobic, anaerobic, physical, hockey players

### Introduction

The word aerobic meaning with oxygen to represent idea. Even so the dynamics of the idea are more complicated than implied by the definition. 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. Oxygen is the spark the fuel needs to burn regardless aerobics is the word in general use. The fact is that cooper codified and organized what fitness means to many people. He is generally credited with being one of the main forces of the current fitness craze. The majority medical opinion is that aerobic programs strengthen heart muscle, increase the efficiency of lungs and offer other wonderful benefits.

Anaerobic exercise is used by athletes in non-endurance sports to build power and by body builders to build muscle mass. Muscles that are trained under anaerobic conditions develop biologically differently giving them greater performance in short duration-high intensity activities.

Hockey is indeed said to be the oldest of all games played with a ball and stick. It has the thrill of a romantic journey travelling around the world in search of a home where it would be accorded the respect it deserves. It has become a reality in India; Hockey is one among the fastest team sports.

### Methodology

To achieve the purpose of the study, 60 male hockey players from the Sports Hostel, Tirunelveli were randomly selected as subjects and their age were 14 – 16 years. They were assigned into four groups, namely, experimental group I, experimental group II, experimental group III and control group. Experimental group I served as aerobic training group, Group - II, served as anaerobic training, group III served as combined group of aerobic and anaerobic training, and the fourth group served as control group.

The study was formulated as a true random group design consisting of a pre-test and post test. The subjects (N=60) were randomly assigned to four groups of fifteen male hockey players. They were assigned into four groups, namely, experimental group I, experimental group II, experimental group III and control group.

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Experimental group I served as aerobic training group, Group - II, served as anaerobic training group, group III served as combined group of aerobic and anaerobic training and the fourth group served as control group. Pre tests were conducted for all the 60 subjects on speed. After the experimental period of 12 weeks post test were conducted and the score was recorded. Speed was assessed by 50m run unit of measurement in seconds. The pre and post test randomized control group design was use as experimental design. No attempt was made to divide the groups in any manner. The collected data from the four groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with dependent ‘t’ test to find out

the significant improvement between pre and post test means of the both groups and analysis of co variance (ANCOVA) was used to find out the significant difference between experimental and control groups. Whenever the ‘F’ ratio for adjusted test was found to be significant, the Scheffe’s test was applied as post-hoc test to find out paired mean difference. In all the cases 0.05 level of significant was fixed to test the hypothesis.

**Results and Discussion**

Table 1 presents per and post test means, standard deviations and dependent ‘t’ test values on speed of experimental and control groups.

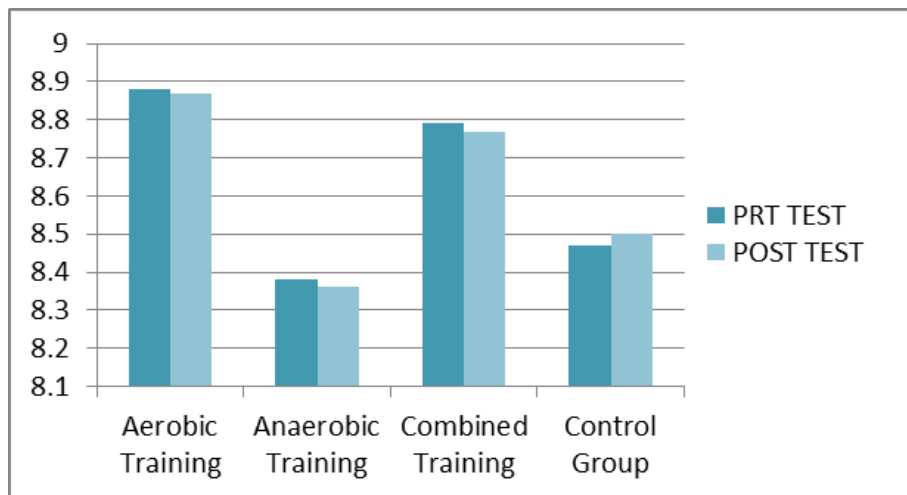
**Table 1:** Means, Standard Deviation and Dependent ‘t’ Test Values On Speed among Experimental and Control Groups

Tests	Aerobic Training		Anaerobic Training		Combined Training		Control Group	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre Test	8.88	0.70	8.38	0.51	8.79	0.59	8.47	0.70
Post Test	8.87	0.70	8.36	0.51	8.77	0.58	8.50	0.71
T - Test	11.22		14.00		5.10		2.09	

\*Significant at .05 level. The table value required at .05 level with df 14 is 2.14.

From the table, the obtained t- test value of aerobic, anaerobic and combined training groups are 11.22, 14.00 and 5.10 respectively which are greater than tabulated t- value of 2.14 with df 14 at .05 level of confidence. This means that the aerobic, anaerobic and combined training groups had effects

on participants’ speed. However control group did not so any significant improvement on participants’ speed because they were not underwent any special Training. Figure 1 illustrate pre and post test means aerobic, anaerobic and combined training groups and control group on speed of hockey players.



**Fig 1:** Mean values of pre and post test of aerobic, anaerobic, aerobic, comnined training and control group on speed among hockey players

The statistical analysis comparing the initial and final means of speed due to combined effect of aerobic and anaerobic

training, and aerobic training presented in Table 2.

**Table 2:** Results of Analysis of Covariance on Speed among Experimental and Control Groups

Adjusted Post Test Means				Sources of variance	sum of square	df	Mean squares	F ratio
Aerobic Group	Anaerobic Group	Combined Group	Control Group					
8.62	8.61	8.61	8.66	Between	0.02	3	0.01	12.70*
				within	0.03	55	0.00	

\*Significant at .05 level. The table value required at .05 level with df 3 & 55 is 2.78.

The obtained F ratio value is 12.70, which is higher than the table value 2.78 with df 3 and 55 required for significance at .05 level. Since the value of F-ratio higher than the table value, it indicates that there was significant difference among the adjusted post test means Aerobic, Anaerobic, Combined and Control group. To find out which of the four paired means had a significant difference, the scheffe’s post hoc test was applied and the results are presented in table 2.

**Conclusions**

The following conclusions were derived from the present study.

1. The control group did not showed any significant improvement on any of the speed among Tirunelveli district players.
2. The aerobic training group had shown significant improvement on speed among district level hockey

- players.
3. The anaerobic training group had shown significant improvement on speed, among district level hockey players.
  4. The combined group of aerobic and anaerobic training group had shown significant improvement on speed among district level hockey players.

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