

## FULL LENGTH ARTICLE

**Effect of Parallel Type of Aerobic and Anaerobic Training on Muscular Endurance of Hockey**

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**Abstract:** The aim of this study is to find out the effect of parallel type aerobic and anaerobic training on the muscular endurance of hockey players. Forty five male hockey players selected from Department of Physical Education and Sports Science, Annamalai University, Tamil Nadu. They were divided into three groups, namely, aerobic training group - I and anaerobic training group - II and control group - III. The both groups experimented with aerobic and anaerobic training respectively for 8 weeks. The data collected from the two groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases statistical significance was fixed at 0.05 levels.

**Key Words:** Parallel, Aerobic and Anaerobic Training, Muscular Endurance.

## 1 Introduction

Training improves player's performance. Selecting the appropriate training methods to incorporate in our training program is important for a number of reasons. There are several different training methods that can be used to improve player's ability in different sports. How they decide which methods will work best for their sports. What they need to do is to look at the intensity and duration of energy use to chosen sport. Training also results in physical changes in the muscles. These will improve their tolerance for the stresses of prolonged exertion.

Aerobic training, on the other hand provides its benefits by improving the cardiovascular and oxygen delivery systems to the muscle cell. These include improvements in both cardiac output, the amount of blood pumped by the heart per minute, and at the muscle fiber level, there is an increase in the extraction of oxygen from the blood cells in the capillaries. In addition, there is an improvement in the efficiency of the cellular metabolic pathways which convert glucose into ATP.

Sprint activities also use anaerobic pathways. If the sprint lasts more than 5 or 10 seconds, lactic acid clearance becomes an issue because of the negative effects of lactic acid on muscle performance. The training focused on anaerobic activities will

enhance the ATP and CP energy transfer pathways as well as improving the tolerance for, and clearance of, lactic acid.

There exists a need for further research to determine a training that could be beneficial for muscular endurance of hockey players. Hence, in this research paper, the investigator studied the effect of parallel type of aerobic and anaerobic training on the muscular endurance of hockey players.

## 2 Methodology

To achieve the purpose of this study, forty five male hockey players from the Department of Physical Education and Sports Science, Annamalai University, Tamil Nadu, were selected randomly as the subjects and their age ranged between 21 to 28 years. The selected subjects were divided into three groups, namely, aerobic training group anaerobic training group and control group consisting of 15 hockey players in each group. The experimental period was 8 weeks. The data collected from the two groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any.

In all the cases statistical significance was fixed at 0.05 levels.

**2.3 Results and Discussion**

The adjusted post-test means of the parallel type of aerobic and anaerobic training and control groups are 38.53, 37.49 and 34.43 respectively. The obtained “F” ratio of 18.96 for adjusted post scores is greater than the table value of 3.23 for df 2 and 41 required for significance at 0.05 level of confidence on muscular endurance.

The results of the study indicated that there was a significant difference among the adjusted post-test means of a parallel type of aerobic and anaerobic training and control groups on muscular endurance. To determine the significance difference among the three paired means, the Scheffe’s test was applied as post-hoc test and the results are presented in Table - II

From table-II shows that the mean difference values between the parallel type of aerobic training and control groups; parallel type of anaerobic trianing and control groups 4.10 and 3.06 respectively on muscular endurance which were greater than the confidence interval value 2.14 required for significance at .05 level of confidence.

The results of the study also showed that parallel groups have no significant differences on muscular endurance when compared between the experimental groups. Hence, it was concluded from the results both training groups were better improvement on muscular endurance when compared to control group.

**Table – 1**

Analysis of covariance on muscular endurance of experimental and control groups

	<b>Aerobic Training Group</b>	<b>Anaerobic Training Group</b>	<b>Control Group</b>	<b>SOV</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean squares</b>	<b>‘F’ ratio</b>
Pre test Mean SD	33.80	34.33	34.26	B	2.53	2	1.26	0.36
	1.82	1.95	1.83	W	146.66	42	3.49	
Post test Mean SD	38.46	37.53	34.46	B	131.37	2	65.68	18.01*
	2.41	1.59	1.60	W	153.20	42	3.64	
Adjusted Post test Mean	38.53	37.49	34.43	B	135.32	2	67.66	18.96*
				W	146.27	41	3.56	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 2 and 42 is 3.22 and degree of freedom 2 and 41 is 3.23.)

\*Significant at .05 level of confidence

**Table - II**

Scheffe’s post hoc test for the differences among paired means of parallel type aerobic and anaerobic training groups and control group on muscular endurance

<b>Aerobic Training Group</b>	<b>Anaerobic Training Group</b>	<b>Control Group</b>	<b>Mean difference</b>	<b>Confidence interval</b>
38.53	37.49		1.04	2.14
38.53		34.43	4.10*	2.14
	37.49	34.43	3.06*	2.14

\*Significant

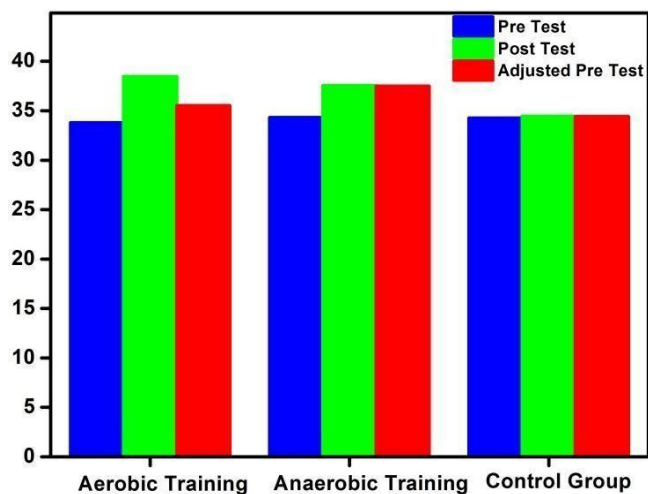


Figure 1 Pyramid diagram showing the mean value on muscular endurance of parallel type aerobic and anaerobic training groups and control groups

### 3 Discussion and Findings

The result of the study exposed that due to the eight weeks of parallel types of aerobic and anaerobic training the muscular endurance significantly increased of the hockey players. These results are conformity with the following studies. Aerobic fitness reflects the endurance capability of the player's heart, lungs and muscles [1]. Superior skill and physical performance have been developed with the use of extensive and specific training programs [2]. Stated that both aerobic and anaerobic exercises had almost the same effect in improving the body composition of the participants [3]. In conclusion, parallel types of aerobic and anaerobic exercise improved muscular endurance among hockey players.

### References

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