

Effect of Anaerobic Interval Training on Selected Physical and Skill Variables among State-Level Hockey Players

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ABSTRACT

The purpose of the present study was to examine the effect of anaerobic interval training on selected physical and skill variables among state-level hockey players. Thirty male state-level hockey players aged between 18 and 23 years were selected as subjects and randomly divided into two groups: an experimental group (n = 15) and a control group (n = 15). The experimental group underwent anaerobic interval training for six weeks with three training sessions per week, while the control group continued their regular routine activities. Speed, agility, and shooting accuracy were selected as the dependent variables and were measured using the 50-meter sprint test, Illinois agility test, and hockey goal target test respectively. Paired t-test was used to compare pre-test and post-test scores within the groups, and independent t-test was used to compare the post-test scores between the groups. The results revealed significant improvements in speed, agility, and shooting accuracy in the anaerobic interval training group, whereas the control group did not show significant changes. The independent t-test results also showed significant differences between the experimental and control groups in all selected variables. The findings of the study indicate that anaerobic interval training is effective in improving selected physical and skill variables among state-level hockey players.

Keywords: Anaerobic Interval Training, Speed, Agility, Shooting Accuracy, Hockey Player

INTRODUCTION

Field hockey is a high-intensity intermittent sport that requires players to perform repeated bouts of sprinting, rapid changes of direction, and precise technical execution during match play. Successful performance in hockey largely depends on both physical fitness and technical skill abilities. Among the important physical components required for effective performance are speed and agility, which enable players to accelerate quickly, evade opponents, and respond efficiently to dynamic game situations. In addition to these physical components, shooting accuracy is a crucial skill variable that directly influences scoring opportunities and match outcomes. Previous studies have highlighted that physical fitness components such as speed, agility, and coordination play a significant role in determining performance in intermittent team sports like hockey (Reilly & Borrie, 1992; Spencer et al., 2005).

In recent years, sports scientists and coaches have increasingly emphasized the importance of scientifically designed training programmes to enhance athletic performance. One such method is anaerobic interval training, which involves repeated bouts of high-intensity exercise interspersed with short recovery periods. This type of training primarily targets the anaerobic energy system and improves the ability of athletes to perform repeated high-intensity efforts. Research has shown that high-intensity interval training can significantly improve sprint performance, anaerobic capacity, and neuromuscular efficiency in athletes (Buchheit & Laursen, 2013; Iaia & Bangsbo, 2010).

Anaerobic interval training is particularly relevant for sports such as hockey, where players frequently perform short bursts of sprinting, rapid directional changes, and explosive movements during match play.

These movements place high demands on the anaerobic energy system and require well-developed speed and agility abilities. Studies have indicated that sprint-based and high-intensity training methods can significantly enhance change-of-direction speed and overall performance in team sport athletes (**Sheppard & Young, 2006; Young & Farrow, 2006**).

Despite the increasing application of anaerobic interval training in sports conditioning programmes, limited research has specifically examined its effect on selected physical and skill variables among state-level hockey players. Therefore, the present study was undertaken to examine the effect of anaerobic interval training on speed, agility, and shooting accuracy among state-level hockey players by comparing an experimental group undergoing anaerobic interval training with a control group.

Objectives of the Study

- To determine the effect of anaerobic interval training on speed among state-level hockey players.
- To determine the effect of anaerobic interval training on agility among state-level hockey players.
- To determine the effect of anaerobic interval training on shooting accuracy among state-level hockey players.

METHODOLOGY

Research Design

The study employed a pre-test and post-test experimental design with an experimental group and a control group. The experimental group underwent a structured anaerobic interval training programme, while the control group continued their regular activities without any specific training intervention.

Participants

Thirty male state-level hockey players aged between 18 and 23 years were selected as subjects for the study. The participants were randomly divided into two equal groups consisting of fifteen subjects each:

- Experimental Group – Anaerobic Interval Training (n = 15)
- Control Group – No specific training (n = 15)

Criterion Measures for Selected Physical and Skill Variables

S. No	Variable	Test Used
1	Speed	50 Meter Sprint Test
2	Agility	Illinois Agility Test
3	Shooting Accuracy	Hockey Goal Target Test

Training Protocol

The anaerobic interval training programme was conducted for a period of six weeks with three training sessions per week. Each training session lasted approximately 45 to 60 minutes and included warm-up, high-intensity interval drills such as repeated sprints and shuttle runs, and cool-down exercises. The control group did not participate in the specialized training programme and continued their normal routine activities during the study period.

Statistical Analysis

Descriptive statistics such as mean and standard deviation were calculated for all variables. Paired t-test was used to determine the difference between pre-test and post-test scores within each group. Independent t-test was applied to compare the post-test scores between the experimental and control groups. The level of significance was set at 0.05.

Paired' Test Results on Speed, Agility and Shooting Accuracy of Anaerobic

Variable	Group	Test	N	Mean	SD	DM	t-ratio	P-value
Speed	Anaerobic Training	Pre	15	7.51	0.07	0.27	84.52	.000*
		Post	15	7.23	0.06			
	Control Group	Pre	15	7.51	0.07	0.000	0.25	.806
		Post	15	7.51	0.06			
Agility	Anaerobic Training	Pre	15	16.41	0.16	0.58	61.25	.000*
		Post	15	15.82	0.12			
	Control Group	Pre	15	16.41	0.16	0.002	0.76	.458
		Post	15	16.41	0.16			
Shooting Accuracy	Anaerobic Training	Pre	15	5.46	0.51	2.66	10.58	.000*
		Post	15	8.13	0.91			
	Control Group	Pre	15	5.46	0.51	0.066	0.16	.869
		Post	15	5.40	1.63			

Interval Training & Control Group

RESULTS

- The results show that the mean speed improved from 7.51 seconds to 7.23 seconds after the training programme, and the difference is statistically significant ($p < 0.05$).
- The mean agility improved from 16.41 seconds to 15.82 seconds, indicating a significant improvement in agility after anaerobic interval training.
- The mean shooting accuracy increased from 5.46 to 8.13, and the calculated t-value indicates a significant improvement in shooting accuracy among the players.
- The results show that the mean speed remained almost the same (7.51 to 7.51 seconds) and the difference is not statistically significant.
- The mean agility score also remained unchanged (16.41 to 16.41 seconds), indicating no improvement in agility among the control group.
- The mean shooting accuracy showed a very small change (5.46 to 5.40), and the results indicate that the difference is not statistically significant.

Table – 2 Independent 't' Test Results on Speed, Agility and Shooting Accuracy of Anaerobic Interval Training & Control Group

Variable	Group	N	Mean	SD	't' - ratio	P-Value
Speed	Anaerobic Training	15	-.2793	.01280	-65.625	.000
	Control Group	15	-.0007	.01033		
Agility	Anaerobic Training	15	-.5853	.03701	-59.282	.000

	Control Group	15	.0020	.01014		
Shooting Accuracy	Anaerobic Training	15	2.6667	.97590	5.823	.000
	Control Group	15	-.0667	1.53375		

- The independent t-test results indicate a significant difference in speed improvement between the anaerobic training group and the control group.
- There is also a significant difference in agility improvement between the two groups, favouring the anaerobic interval training group.
- The results further show a significant difference in shooting accuracy improvement between the two groups, indicating that anaerobic interval training was more effective.

SUMMARY OF THE RESULTS

- The results of the paired t-test showed that the anaerobic interval training group demonstrated significant improvement in speed, agility, and shooting accuracy after six weeks of training.
- The control group did not show any significant improvement in speed, agility, or shooting accuracy between the pre-test and post-test.
- The independent t-test results revealed a significant difference between the anaerobic interval training group and the control group in speed, agility, and shooting accuracy, favouring the anaerobic interval training group.
- Overall, the findings indicate that anaerobic interval training is effective in improving selected physical and skill variables among state-level hockey players.

DISCUSSION & CONCLUSION

The purpose of the present study was to examine the effect of anaerobic interval training on selected physical and skill variables among state-level hockey players. The results revealed that the anaerobic interval training group showed significant improvement in speed, agility, and shooting accuracy, while the control group did not show any significant changes. These findings indicate that anaerobic interval training is effective in improving both physical and skill performance among hockey players. The significant improvement in speed observed in the experimental group may be attributed to the high-intensity nature of anaerobic interval training, which enhances neuromuscular coordination and anaerobic energy system efficiency. Since hockey involves repeated short bursts of sprinting, such training helps players improve acceleration and sprint performance. Similar findings have been reported in previous studies indicating that high-intensity interval training improves sprint performance and anaerobic capacity in athletes (Buchheit & Laursen, 2013; Iaia & Bangsbo, 2010).

The results also showed a significant improvement in agility among the anaerobic interval training group. Agility is essential in hockey as players frequently change direction while maintaining balance and control. The improvement in agility may be due to the repeated sprint drills and rapid movement patterns included in the training programme. Previous research has also reported that sprint-based and high-intensity interval training significantly improve agility and change-of-direction ability in athletes (Sheppard & Young, 2006; Young & Farrow, 2006). Similarly, the study found a significant improvement in shooting accuracy in the experimental group. Improvements in physical fitness components such as speed, power, and coordination may contribute to better technical skill execution in sport. These findings support earlier research suggesting that improvements in physical conditioning can positively influence sport-specific skills (Bompa & Buzzichelli, 2019; Stone et al., 2007).

In contrast, the control group did not show significant improvement in any of the selected variables, indicating that the improvements observed in the experimental group were primarily due to the anaerobic interval training programme. The independent t-test further confirmed that the anaerobic interval training

group performed significantly better than the control group in speed, agility, and shooting accuracy. Overall, the findings of the study suggest that anaerobic interval training is an effective method for improving selected physical and skill variables among state-level hockey players.

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