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The effect of speed, agility and quickness drills training program on selected physiological variables on hockey players

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Abstract
Introduction: Drastic change in game of hockey from grassy surface to synthetic turf demands rigorous physical training. Hence, Speed, agility, and quickness (S.A.Q.) training has become a popular way to train athletes. This method is popular from several years, but it is not used by all athletes primarily due to a lack of education and techniques.
Aim: study was conducted to find out the effect of 12 weeks of speed, agility and quickness drills training program on selected physiological variables of hockey players.
Methodology: The sample of 200 junior hockey male players from Amritsar district participating in junior Inter District, junior national and school national championship whose age ranged between 17 to 19 years. The data was analysed by applying Analysis of Co-Variance (ANCOVA)
Findings and Conclusions: It was clearly found that the effect of SAQ drills training help to improve the selected physiological variables of hockey players. It was seen that there is progressive improvement in physiological variables of experiment group of hockey player after twelve weeks of training programme. After giving the SAQ drills training we found that there is a significant effect on the selected physiological variables (vital capacity, resting pulse rate, Pulmonary ventilation rate).

Keywords: speed, agility and quickness, training, physiological variables

Introduction

Amongst most of the sports that is being played these days Hockey is one of the favourite of all. In the general sense it is a kind of sport in which two teams compete by trying to manoeuvre the ball into the opponent's nest using a hockey stick. However, games like hockey have been played in almost every populated region in the globe from Ancient Greece to North America. Hockey has also been played in the ancient times in both foot and in horseback. However, these days playing hockey while sitting on the horse is called the game of Polo. There are many types of hockey like field hockey, ice hockey, roller hockey (online) and roller hockey (quad). However, the most famous form of hockey is the Field hockey. This type of hockey is played on gravel or natural grass with a small hard ball. When hockey is use to play on the grassy surface the pace of game was not fast as Nowadays, it is played on a special type of artificial surface known as the astro turf with changing scenario in hockey the demands of trailing and practice is also changed. Hence, (S.A.Q.) training has become a popular way to train athletes. Whether they are school children on a soccer field or professional in a training camp, they can all benefit from speed, agility, and quickness training. This method has been around for several years, but it is not used by all athletes primarily due to a lack of education regarding the drills. Speed, agility, and quickness training may be used to increase speed or strength, or the ability to exert maximal force during high-speed movements. Some jenefits of speed, agility, and quickness training include increases in muscular power in all multiplanar movements; brain signal efficiency; kinaesthetic or body spatial awareness; motor skills; and reaction time. Speed, agility, and quickness training can cover the complete spectrum of training intensity, from low to high intensity. Every individual will come into a training programme at a different level; thus training intensity must coincide with the individual's abilities. Low intensity speed, agility, and quickness drills can be used by everyone for different applications. SAQ drills can also be used to teach movement, warm-up, or to condition an athlete. No significant preparation is needed to participate at this level of speed, agility, and quickness training. Higher intensity drills require a significant level of preparation. A simple approach to safe participation and increased effectiveness is to start a concurrent strength-training program when starting speed, agility, and quickness training. Speed has long been considered as just one single entity: how fast an object goes from point A to point B. Only recently has speed been studied and broken down into stages such as acceleration, the planning out phase, deceleration, etc. Much of this research has been carried out by sports coaches involved in straight-line running, so that the jumping, turning and zigzagging speed necessary in volleyball has been somewhat neglected. Those involved with the development of SAQ programmes have sought to fill this void so as to develop all types of speed, particularly for team sports such as hockey. SAQ programmes break speed down into three main areas of skill: speed, agility and quickness. Although these may appear to be quite similar, they are in fact very different in terms of how they are trained, developed and integrated into a player's performance. When

these skills are successfully combined and specialist SAQ equipment is utilised, they provide the coach with the tools to make good player into an outstanding one. It is remarkable what players can achieve with an SAQ programme.

Statement of the Problem

The purpose of this study is to find out "The Effect of 12 Weeks of S.A.Q Drills Training Program on Selected Physiological Variables on Hockey Players"

Objective of the Study

1. To measure the effect of 12 weeks S.A.Q. drills training on Vital Capacity of male state and national level field hockey players of Amritsar district in Punjab.
2. To check the effect of 12 week S.A.Q. drills training on Resting Pulse rate of male state and national level field hockey players of Amritsar district in Punjab.
3. To calculate the effect 12 weeks S.A.Q. drills training on pulmonary ventilation rate of male state and national level field hockey players of Amritsar district in Punjab.

Methodology

Sample of 200 junior male hockey players from Amritsar state participating in junior national, school national Championships conducted by the SGFI, IHF& India hockey were selected as subjects. The random sampling method was used to collect the desired sample for the present study. The study was pre-test and post-test randomized group design which consisted of control group and experimental group for each level was used to find out effect of S.A.Q. drills training on the skills performance of hockey players. Equal numbers (hundred) of subjects was assigned randomly to both the groups. The experimental treatment was also assigned randomly to both level groups' i.e. experimental group of 100 junior male hockey players and the other control group is also consist of 100 junior male hockey players. Experimental group was exposed to training with a set of drills selected for specific purpose. The experimental group was trained with speed, agility, and quickness drills for a period of twelve weeks (84 days). The training sessions was conducted three days a week i.e. (Monday, Wednesday, and Friday). Measurement of skills performance ability was taken for both the groups before and after the experimental period of twelve weeks.) The data was analysed by applying Analysis of Co-Variance (ANCOVA) Technique to find out the effect of S.A.Q. drills on skills of hockey players. The level of significance was set at 0.05.

Results

Table No. 1 have shown the 'F' value of 45.91 for vital capacity, which was recorded to be highly significant at 0.05 levels with 1/197 df as the tabulated value of 3.84 required to be significant at 0.05 level. This table also indicated that there was significant difference in adjusted means of vital capacity test of hockey players between experimental group and control group.

Since the differences were found to be significant therefore, the least significant difference post hoc test when applied in order to determine the significant of difference between paired means. Further, the L.S.D. analysis for paired means on vital capacity has been presented in table No.2, which was also recorded significant mean differences (0.377*) between adjusted means of both groups at 5% levels. Means values of vital capacity test of control and experimental groups (pre, post and adjusted) are presented graphically in figure-1.

Table 1: ANCOVA between Experimental Group and Control Group on Vital Capacity of Hockey Players for Pre and Post Test

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	34.223[a]	2	17.111	110.436	.000	.529
Intercept	.038	1	.038	.244	.622	.001
Pre	27.110	1	27.110	174.964	.000	.470
Groups	7.113	1	7.113	45.908	.000	.189
Error	30.524	197	.155			
Total	3565.784	200				
Corrected Total	64.747	199				

R Squared = .529 (Adjusted R Squared = .524) *Significant at 0.05 level. df: 1/197 =3.84.

Table 2: Paired Means between Experimental Group and Control Group on Vital Capacity of Hockey Players for Pre and Post Test

Groups	N	PRE Mean	POST Mean	Adjusted Means	Mean Differences	S. Error	Sig.	95% Confidence interval for Differences	
								L. Bound	U. Bound
Control	100	3.526	3.995	3.995	-.377*	.056	.000	-.487	-.267
Experimental	100	3.526	4.373	4.373	.377*	.056	.000	.267	.487
General Mean	200	3.526	4.184						

* Significant at 0.05 level.

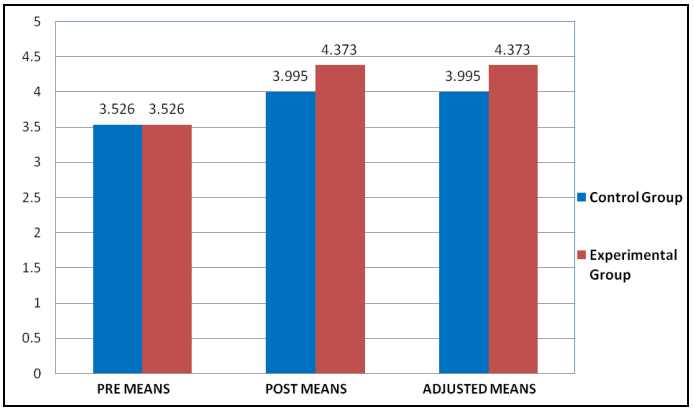

Fig 1: Comparison of pre means, post means and adjusted means of experimental and control group in relation to vital capacity of hockey players

Resting Pulse Rate

Table No. 3. have shown the 'F' value of 380.90 for pulse rate, which was recorded to be highly significant at 0.05 levels with 1/197 df as the tabulated value of 3.84 required to be significant at 0.05 level. This table also indicated that there was significant difference in adjusted means of pulse rate test of hockey players between experimental group and control group. Since the differences were found to be significant therefore, the least significant difference post hoc test when applied in order to determine the significant of difference between paired means. Further, the L.S.D. analysis for paired means on pulse rate has been presented in table No.4, which was also recorded significant mean differences (13.169*) between adjusted means of both groups at 5% levels. Means values of pulse rate test of control and experimental groups (pre, post and adjusted) are presented graphically in figure-2.

Table 4: ANCOVA between Experimental Group and Control Group on Pulse Rate of Hockey Players for Pre and Post Test

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	19165.513[a]	2	9582.757	421.265	.000	.810
Intercept	594.503	1	594.503	26.135	.000	.117
Pre	10999.093	1	10999.093	483.529	.000	.711
Groups	8664.530	1	8664.530	380.900	.000	.659
Error	4481.267	197	22.748			
Total	1596830.000	200				
Corrected Total	23646.780	199				

R Squared = .810 (Adjusted R Squared = .809);* Significant at 0.05 level. df: 1/197 =3.84.

Table 4: Paired Means between Experimental Group and Control Group on Pulse Rate of Hockey Players for Pre and Post Test

Groups	N	PRE Mean	POST Mean	Adjusted Means	Mean Differences	S. Error	Sig.	95% Confidence interval for Differences	
								L. Bound	U. Bound
Control	100	95.96	95.34	95.274	13.169*	.675	.000	11.838	14.499
Experimental	100	96.48	82.3	82.106	-13.169*	.675	.000	-14.499	-11.838
General Mean	200	96.22	88.82						

* Significant at 0.05 level.

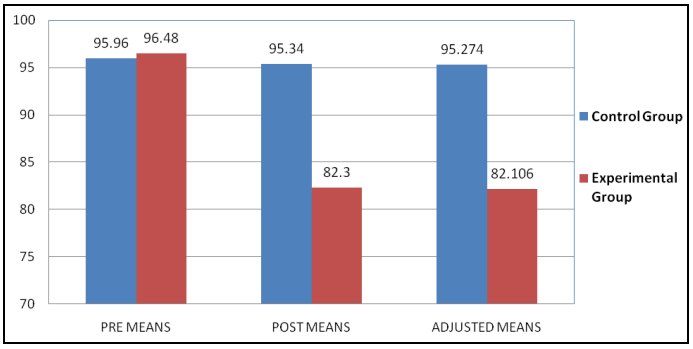

Fig 2: comparison of means, post means and adjusted means of experimental and control group in relation to resting pulse rate of hockey players

Pulmonary Ventilation Rate (resting breathing rate)

Table No. 5 have shown the 'F' value of 627.39* for pulmonary ventilation rate, which was recorded to be highly significant at 0.05 levels with 1/197 df as the tabulated value of 3.84 required to be significant at 0.05 level. This table also indicated that there was significant difference in adjusted means of pulmonary ventilation rate test of hockey players between experimental group and control group.

Since the differences were found to be significant therefore, the least significant difference post hoc test when applied in order to determine the significant of difference between paired means. Further, the L.S.D. analysis for paired means on pulmonary ventilation rate has been presented in table No.6, which was also recorded significant mean differences (3.52*) between adjusted means of both groups at 5% levels. Means values of pulmonary ventilation rate test of control and experimental groups (pre, post and adjusted) are presented graphically in figure-3.

Table 5: ANCOVA between Experimental Group and Control Group on Pulmonary Ventilation Rate of Hockey Players for Pre and Post Test

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1054.250[a]	2	527.125	533.819	.000	.844
Intercept	1.349	1	1.349	1.367	.244	.007
Pre	434.730	1	434.730	440.250	.000	.691
Groups	619.520	1	619.520	627.387	.000	.761
Error	194.530	197	.987			
Total	36044.000	200				
Corrected Total	1248.780	199				

R Squared = .844 (Adjusted R Squared = .843);* Significant at 0.05 level. df: 1/197 =3.84.

Table 6: Paired Means between Experimental Group and Control Group on Pulmonary Ventilation Rate of Hockey Players for Pre and Post Test

Groups	N	PRE Mean	POST Mean	Adjusted Means	Mean Differences	S. Error	Sig.	95% Confidence interval for Differences	
								L. Bound	U. Bound
Control	100	15.74	14.95	14.950	3.520*	.141	.000	3.243	3.797
Experimental	100	15.73	11.43	11.430	-3.520*	.141	.000	-3.797	-3.243
General Mean	200	15.735	13.19						

* Significant at 0.05 level.

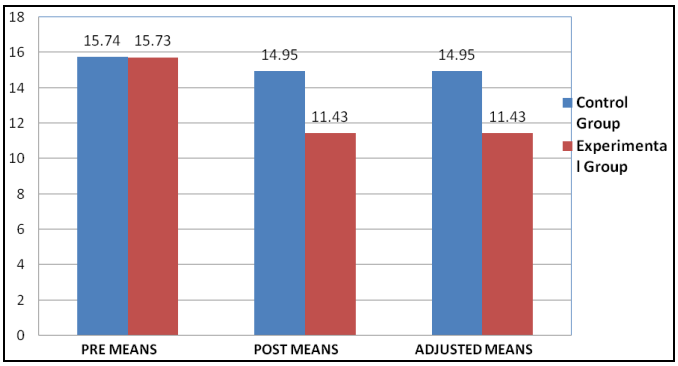

Fig 3: comparison of pre means, post means and adjusted means of experimental and control group in relation to pulmonary ventilation rate of hockey players

Discussion

The results have shown that 12 weeks S.A.Q. drills training improve the selected physiological variables (vital capacity, resting pulse rate and pulmonary ventilation rate). Based on the findings and within the limitation of the study it is noticed that practice of selected S.A.Q. Drills helped to improve selected physiological variables and skills of hockey players. It was seen that there is progressive improvement in all the parameters. After giving the S.A.Q drill training we found that there is significant effect on the selected physiological variables (vital capacity, resting pulse rate, pulmonary ventilation) and hockey skills performance. Similar findings have been earlier mentioned by various researchers that a S.A.Q training has a positive effect on various physiological variable, thus results overall performance of the hockey players. S.A.Q drill needs to be promoted and teacher should be given proper training so that it must be introduced to players during their initial years. So that they can compete in that particular games at various national and international level sports meet.

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