Effect of Sand and Aerobic Training on Selected Physical Fitness Parameters Among College Level Hockey Players

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Abstract

The study sought to investigate the effect of sand and aerobic training on selected physical fitness parameters among college level hockey players. To achieve the purpose of the study (N=60) sixty men hockey players were selected from Thigarajan college, Tamilnadu, India as subjects. The age of the subjects ranged from 18 to 22 years. The selected subjects were divided into three equal groups (N=20). Group I underwent sand training. Group II underwent aerobic training. Group III acted as control group who did not undergo any specialized training program other than their daily routine. The physical fitness parameter such as flexibility, muscular endurance, balance. Were selected as dependent variables and they were assessed by sit and reach test, push - up, flamingo test respectively. The subjects were concerned with their particular training for a period of six weeks, three days per week. The collected data from three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 for all the cases to test the hypothesis. The result of the study reveals that the sand and aerobic training groups achieved significant improvement on selected physical fitness parameter such as flexibility; muscular endurance and balance of inter college men hockey players.

***Keywords**: Sand Training, Aerobic Training, Physical Fitness Parameter, Flexibility, Muscular Endurance and Balance.*

Introduction

Sand Training

Sand, mud, dirt, grass and trails are excellent training surfaces. They force to run slower for the same heart rate, giving the main benefit of altitude training that is, lower risk

of injury as high running intensity is the second-best predictor of injury. Half the purpose of 80% of running is to develop a big pump and to maximize the bellows. The heart and lungs don't care if one is swimming, biking, or running at 10-minute miles in 6 inches of mud. However, the running and biking muscles do need some training at 1-2 minutes per mile (for running) slower than race pace, at race pace and also at faster than race pace. The trouble with deep sand is that it gets in to the shoes. It can also mess with the running form. But it gives one a tough workout with very low mileage; the back and shoulders get a workout because one has to maintain balance (**Kondala Rao, 2016).**

Aerobic Training

Aerobic exercise, also known as cardio-vascular exercise, is an activity that is sustained for a long period of time, that is rhythmic and that affects large muscle groups. Aerobic exercise impacts the cardio-vascular and circulatory system and makes your heart stronger and more efficient. Aerobics, step classes, water aerobics and swimming are examples of aerobic exercises involving the use of some type of equipment. Specific kinds of equipment that can be used specifically for aerobic exercises include treadmills, elliptical machines, bicycles and jump ropes. Also, active sports like football, basketball, hockey and such others are great for aerobic exercises **(Burgess et al. 2006).**

Hockey

Hockey is a game with different type of athletic movements and as a result it requires different types of training for elite performance. Hockey players must meet the very physically challenging demands perhaps it is a multi-sprint sport. Hockey is being played on a ground with the same number of players for a similar duration and physiologically it is close to soccer. In hockey power is required for acceleration, speed and quick changes in direction. Strength allows the players to shoot more powerfully with accuracy and pass over a greater range of distances. The distinctive demands of hockey are strength endurance and explosive power **(Sivachandran, P. Y. (2014).**

Methodology

To achieve the purpose of the study (N=60) sixty men hockey players were selected from Thigarajan college, Tamilnadu, India as subjects. The age of the subjects ranged from 18 to 22 years. The selected subjects were divided into three equal groups (N=20). Group I

underwent sand training. Group II underwent aerobic training. Group III acted as control group who did not undergo any specialized training program other than their daily routine. The physical fitness parameter such as flexibility, muscular endurance, balance. Were selected as dependent variables and they were assessed by sit and reach test, push - up, flamingo test respectively. The subjects were concerned with their particular training for a period of six weeks, three days per week. The collected data from three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 for all the cases to test the hypothesis.

Table I: Selected Variables and Their Tests

S. No	Variables	Test	Unit of Measurements
1	Flexibility	Sit and Reach Test	In Meters
2	Muscular Endurance	Push - Up	In Counts
3	Balance	Flamingo Test	In Seconds

Table II: Analysis of Covariance of Flexibility on Experimental and Control Group of Men Hockey Players (Scores in Meters)

Test	STG	ATG	CG	Sum of Variance	Sum of Square	Degree of Freedom	Mean Square	'F' Ratio
Pre Test	31.07	30.02	30.07	Between	8.40	2	4.20	0.65
				Within	271.80	57	6.50	
Post Test	34.13	32.33	30.93	Between	77.20	2	38.60	10.53*
				Within	154	57	3.67	
Adjusted Post Test	33.78	32.45	31.17	Between	50.05	2	25.03	16.61*
				Within	61.79	56	1.51	

***Significant at 0.05 level of confidence**

The pre, post-test and adjusted post-test mean values of flexibility on Sand Training Group (STG), Aerobic Training Group (ATG) and Control Group (CG) were 31.07, 34.13, 33.78; 30.02, 32.33, 32.45 and 30.07, 30.93, 31.17 respectively. The obtained F value of adjusted post-test were 16.61 was greater than the table value of 3.23. Hence it was proved that there was a significant improvement on flexibility of college men hockey players.

Figure - I: Pre, Post and Adjusted Post Test Means of Sand Training and Aerobic Training Group and Control Group on Flexibility.

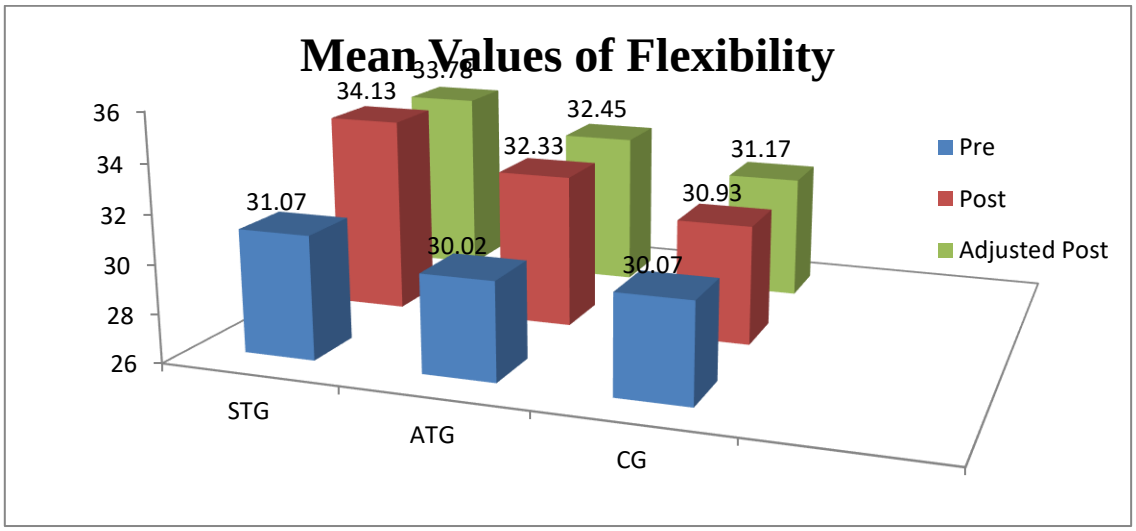


Table III: Analysis of Covariance of Muscular Endurance on Experimental and Control Group of Men Hockey Players (Scores in Counts)

Test	STG	ATG	CG	Sum of Variance	Sum of Square	Degree of Freedom	Mean Square	'F' Ratio
Pre Test	26.4	26.1	26.7	Between	2.28	2	.574	0.74
				Within	345.9	57	7.687	
Post Test	28.8	31.5	26.1	Between	180	2	.45	4.345*
				Within	466	57	10.35	
Adjusted Post Test	28.82	31.81	25.82	Between	215.26	2	.53	19.33*
				Within	172.49	56	2.784	

***Significant at 0.05 level of confidence**

The pre, post-test and adjusted post-test mean values of muscular endurance on Sand Training Group (STG), Aerobic Training Group (ATG) and Control Group (CG) were 26.4, 28.8, 28..82; 26.1, 31.5, 31.81 and 26.7, 26.1, 25.82 respectively. The obtained F value of adjusted post-test were 19.33 was greater than the table value of 3.23. Hence it was proved that there was a significant improvement on muscular endurance of college men hockey players.

Figure - II: Pre, Post and Adjusted Post Test Means of Sand Training and Aerobic Training Group and Control Group on Muscular Endurance.

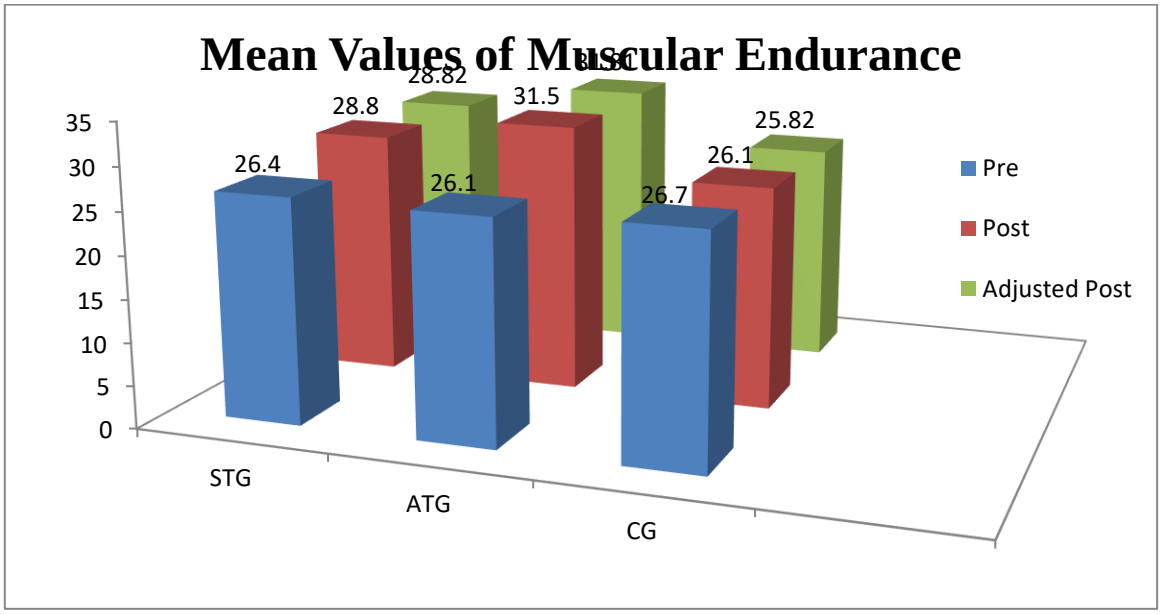


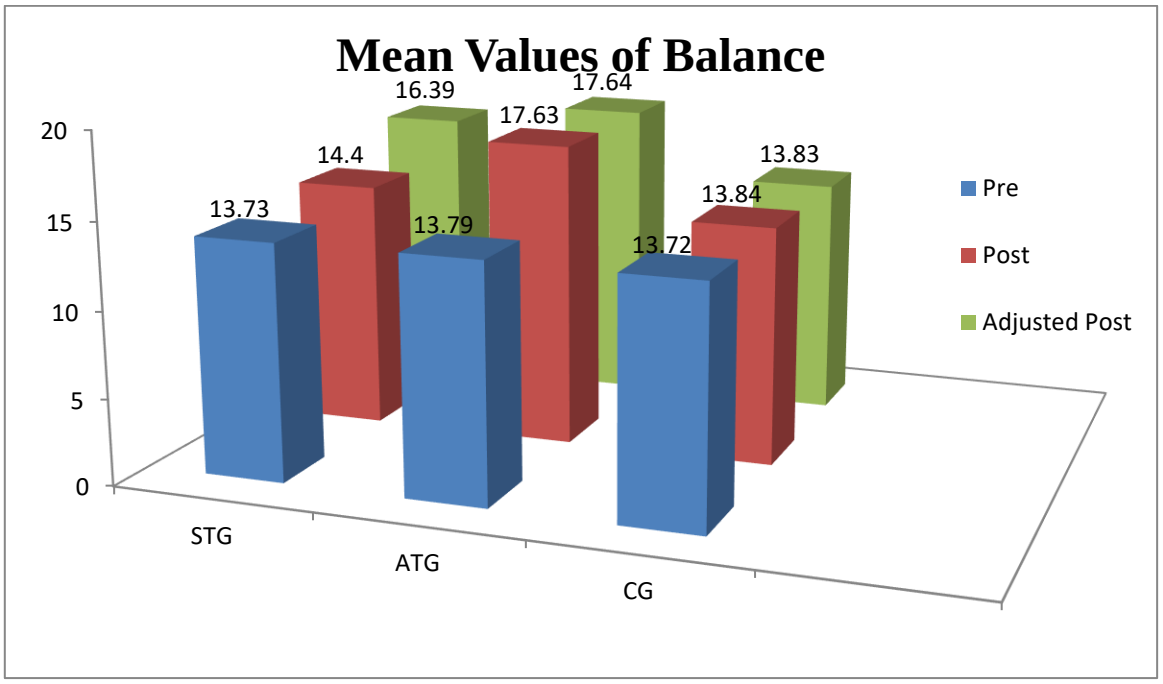
Table IV: Analysis of Covariance of Balance on Experimental and Control Group of Men Hockey Players (Scores in Seconds)

Test	STG	ATG	CG	Sum of Variance	Sum of Square	Degree of Freedom	Mean Square	'F' Ratio
Pre Test	13.73	13.79	13.72	Between	0.06	2	0.03	0.07
				Within	24.29	57	0.43	
Post Test	14.40	17.63	13.84	Between	149.23	2	74.62	71.68*
				Within	59.34	57	1.04	
Adjusted Post Test	16.39	17.64	13.83	Between	150.47	2	75.24	73.63*
				Within	57.22	56	1.02	

***Significant at 0.05 level of confidence**

The pre, post-test and adjusted post-test mean values of balance on Sand Training Group (STG), Aerobic Training Group (ATG) and Control Group (CG) were 13.73, 14.40, 16.39; 13.79, 17.63, 17.64 and 13.72, 13.84, 13.83 respectively. The obtained F value of adjusted post-test were 73.63 was greater than the table value of 3.23. Hence it was proved that there was a significant improvement on balance of college men hockey players.

Figure - III: Pre, Post and Adjusted Post Test Means of Sand Training and Aerobic Training Group and Control Group on Balance.



Discussion of Findings

The result of the study indicates that the experimental group namely as sand Training and aerobic training had significantly improved in the selected dependent variables namely as flexibility, muscular endurance, balance. It is also found that the improvement caused by sand Training and aerobic training was better when compared to control group.

Conclusions

The experimental group's namely as sand Training and aerobic training had achieved significant improvement on selected the physical fitness parameter such as flexibility, muscular endurance, balance when compared to control group.

It was concluded that sand Training as better improvement when comparing to the aerobic training groups on selected the physical fitness parameter such as flexibility, muscular endurance, balance.

It was concluded that college level player should practice both sand Training and aerobic training for positive enhancement of playing.

References

1. *Kondala Rao, 2016. Effect of Sand Training and Spring Board Training on Selected Speed and Endurance Parameters of Football Players.*
2. *Burgess, G., Grogan, S. & Burwitz, L. (2006). Effects of a 6-Week Aerobic Dance Intervention on Body Image and Physical Self-Perceptions in Adolescent Girls. Body Image. 3(1):57-66.*
3. *Sivachandran, P. Y. (2014). Effect of Resistance and Plyometric Training on Selected Physical, Physiological and Skill Performance Variables among Female Hockey Players (Doctoral Dissertation).*