



Effect of Varied Frequency and Duration of Aerobic Training on Selected Physiological Variables of Handball Players

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Abstract

The purpose of the present study is to find out the effect of varied frequency and duration of aerobic training on selected physiological variables of handball players. To achieve the purpose of the present study, sixty students from Kendriya Vidyalaya, Kalpetta, Wayanad, Kerala, India were selected. The selected students are divided in to three groups. Group I participated in aerobic training for 30 minutes, group II participated in aerobic training for 45 minutes and control group did not undergo any training. The experimental group practised for a period twelve weeks. The anaerobic power was measured by margaria kalamen anaerobic power test and the unit is in watts, vital capacity was measured by spirometer and the unit is in litres and peak expiratory flow rate was measured by peak flow meter and the unit is in litres/minute. The three groups were statistically analysed by using analysis of covariance (ANCOVA) at 0.05 level. The result of the study reveals that there was a significant improvement in the experimental groups on selected variables when compared to the control group after the completion of six weeks of training programme. The group who practiced aerobic training for 45 minutes has showed better performance on physiological variables than the other groups.

Keywords: Aerobic Exercises, Handball, Anaerobic Power, Vital Capacity, Peak Expiratory Flow.

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Introduction

Handball is an ideal synthesis of the three fundamental athletic disciplines of running, jumping and throwing. Therefore it is not only a purely competitive sport but also a fine sport to be taken up with advantage by many for purposes of training and health. The player must be able to start quickly, must be a persevering runner, must be able to skillfully deceive his opponent, must be able to swiftly pick up the ball or catch it in the air, must pass the ball with precision to his team-mates and he must be able to execute all sorts of throws. The Handball player is inspired to use his hands as a means of carrying out his ideas. The game is, of course, also faster than other ball games (Sajjal, 1992).

For every moment, the body uses energy. The body can procure this energy in two different ways: Without oxygen (anaerobic) – when there is not enough oxygen, waste products will pile up in the muscles with oxygen (aerobic) – this means that the exercise is performed under circumstances where there is enough oxygen in the muscles. To improve endurance the practioner should train aerobic system and move to lactate threshold. Aerobic training can be divided into three overlapping training intensity areas: low, moderate and high intensity training (Cooper, 1985).

Methodology

The purpose of the present study is to find out the effect of varied frequency and duration of aerobic training on selected physiological variables of handball players. To achieve the purpose of the present study, sixty students from Kendriya Vidyalaya, Kalpetta, Wayanad, Kerala, India were selected. The selected students are divided in to three groups. Group I participated in aerobic training for 30 minutes, group II participated in aerobic training for 45 minutes and control group did not undergo any training. The experimental group practised for a period twelve weeks. The anaerobic power was measured by margaria kalamen anaerobic power test and the unit is in watts, vital capacity was measured by spirometer and the unit is in litres and peak expiratory flow rate was measured by peak flow meter and the unit is in litres/minute. The three groups were statistically analysed for pre-test and post-test by using analysis of covariance (ANCOVA) at 0.05 level of confidence.

Results and Discussion

The findings pertaining to analysis of co-variance between experimental groups and control group on selected physiological variables among handball players for pre-post test respectively have been presented in table No. I to IV.

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Table I. ANCOVA between Experimental Groups and Control Group on Anaerobic Power of Handball Players for Pre, Post and Adjusted Test

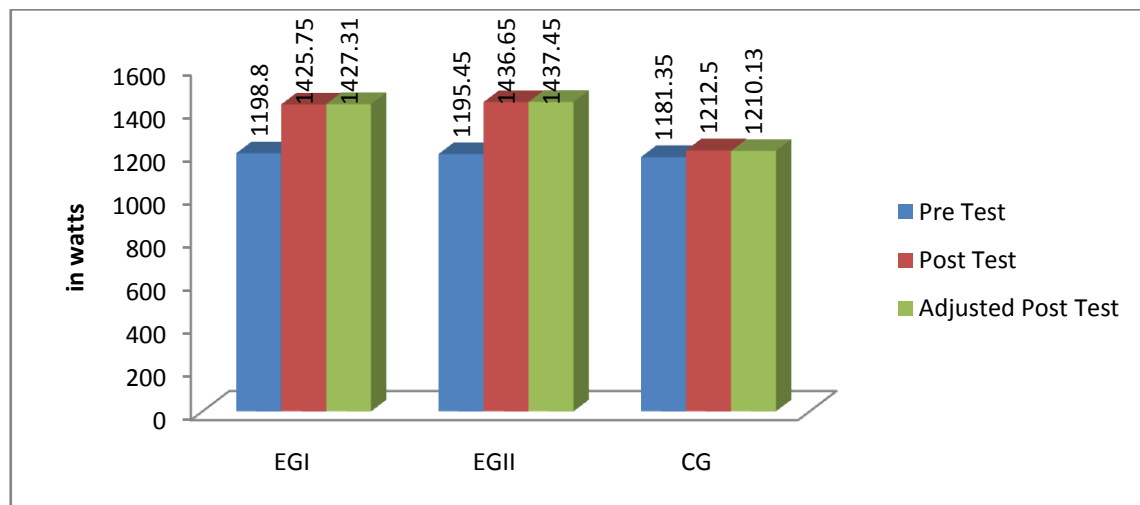
	EG I	EG II	CG	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	1198.80	1195.45	1181.35	BG	3430.23	2	1715.11	0.21
				WG	461906.70	57	8103.62	
Post Test Mean	1425.75	1436.65	1212.50	BG	638917.30	2	319458.65	103.40*
				WG	176099.30	57	3089.46	
Adjusted Post Mean	1427.31	1437.45	1210.13	BG	655016.83	2	327508.41	120.12*
				WG	152674.15	56	2726.32	

** Significant at 0.05 level.

df: 2/56= 3.16

Table No. I revealed that the obtained 'F' value of 120.12 was found to be significant at 0.05 level with df 2, 56 as the tabulated value of 3.16 required to be significant at 0.05 level. The same table indicated that

there was a significant difference in adjusted means of anaerobic power of handball players between experimental group and control group. The graphical representation of data has been presented in figure No.I.

Figure I. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Groups in relation to Anaerobic power**Table II.** ANCOVA between Experimental Groups and Control Group on Vital Capacity of Handball Players for Pre, Post and Adjusted Test

	EG I	EG II	CG	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	4.25	4.16	4.52	BG	1.36	2	0.68	1.97*
				WG	19.65	57	0.34	
Post Test Mean	4.80	4.89	4.51	BG	1.56	2	0.78	9.06*
				WG	4.92	57	0.08	
Adjusted Post Mean	4.83	4.94	4.44	BG	2.60	2	1.30	30.45*
				WG	2.39	56	0.04	

**** Significant at 0.05 level.**

df: 2/56= 3.16

Table No. II revealed that the obtained 'F' value of 30.45 was found to be significant at 0.05 level with df 2, 56 as the tabulated value of 3.16 required to be significant at 0.05 level. The same table indicated that

there was a significant difference in adjusted means of vital capacity of handball players between experimental group and control group. The graphical representation of data has been presented in figure No.II.

Figure II. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to Vital Capacity

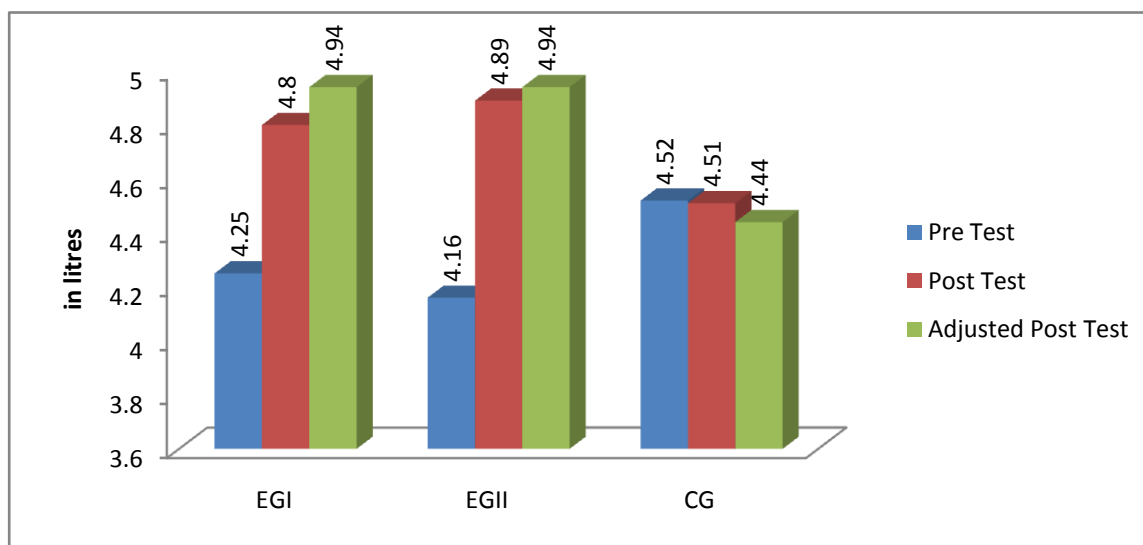


Table III. ANCOVA between Experimental Group and Control Group on Peak Expiratory flow rate of Handball Players for Pre, Post and Adjusted Test

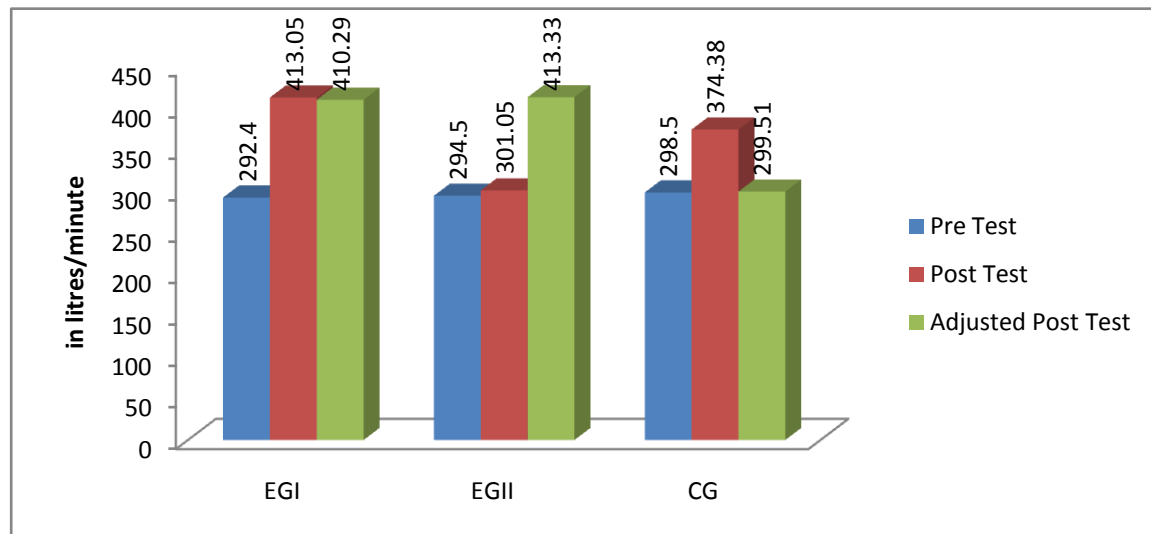
	EG I	EG II	CG	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	292.40	294.50	298.50	BG	384.13	2	192.06	0.49
				WG	22250.80	57	390.36	
Post Test Mean	413.05	301.05	374.38	BG	161493.33	2	80746.66	65.82*
				WG	69920.85	57	1226.68	
Adjusted Post Mean	410.29	413.33	299.51	BG	165763.33	2	82881.66	71.07*
				WG	65300.27	56	1166.07	

**** Significant at 0.05 level.**

d/f: 2/56= 3.16

Table No. III revealed that the obtained 'F' value of 71.07 was found to be significant at 0.05 level with df 2, 56 as the tabulated value of 3.16 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of

peak expiratory flow rate of handball players between experimental group and control group. The graphical representation of data has been presented in figure No.III.

Figure III. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Groups in relation to Peak Expiratory flow Rate**Table IV.** Scheffee's Post Hoc Test of Experimental and Control Groups and Physiological Variables

Sl.No	Variables	Adjusted Means			Mean Difference	CI Value
		EG I	EG II	CG		
1	Anaerobic Power	1427.31	1437.45	-----	10.14	54.06
		1427.31	-----	1210.13	217.18*	
		-----	1437.45	1210.13	227.30*	
2	Vital Capacity	4.83	4.94	-----	0.11	0.20
		4.83	-----	4.44	0.39*	
		-----	4.94	4.44	0.50*	
3	Peak Expiratory Flow Rate	410.29	413.33	-----	3.04	35.35
		410.29	-----	299.51	110.78*	
		-----	413.33	299.51	113.80*	

As per the results of the table – IV, since the mean difference for anaerobic power, vital capacity and peak expiratory flow rate between experimental group I and control group were 217.18, 0.39 and 110.78 respectively, experimental group II and control group were 227.30, 0.50 and 113.80 respectively are higher than the CI value of 54.06, 0.20 and 35.35 respectively. It was concluded that the observed adjusted mean difference is statistically significant. Since the mean difference for anaerobic power, vital capacity and peak expiratory flow rate between experimental group I and experimental group II were 10.14, 0.11 and 3.04 are lesser than the CI value 54.06, 0.20 and 35.35

respectively. It was concluded that the observed adjusted mean difference is statistically not significant.

Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The result of the study reveals that there was a significant improvement in the experimental groups on selected variables when compared to the control group after the completion of six weeks of training programme.

2. The group who practised aerobic training for 45 minutes group has shown better performance on physiological variables than the aerobic training for 30 minutes group and other groups.

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