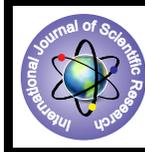


Effect of Intermittent Training and Aerobic Exercise on Selected Endurance Parameters of College Men Volleyball Players



Physical Education

KEYWORDS : Intermittent Training, Aerobic Exercise, Speed Endurance and Muscular Endurance

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ABSTRACT

Aim of this study was to find out the effect of Intermittent Training and Aerobic Exercise on Selected Endurance Parameters of College Men Volleyball Players. The study was conducted on forty five (N=45) men Volleyball players who have participated University of Madras inter collegiate Volleyball tournament during the year 2013-2014, were selected as subjects. The age of the subjects were ranged from 17 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent Intermittent Training, Group-II underwent Aerobic Exercise, and Group III acted as Control. The Experimental groups underwent their respective training for 12 weeks in addition to the regular training as per College curriculum. Speed Endurance and Muscular Endurance were selected as dependent variables. Speed Endurance was assessed by 150 meters run test and Muscular Endurance was assessed by Sit & Reach Test. The data collected from the three groups prior to and post experimentation on Speed Endurance and Muscular Endurance was statistically analyzed by using Analysis of Covariance (ANCOVA). Hence, whenever the obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed. The results of the study suggest Intermittent training group was better than other groups on the development of Speed Endurance and Muscular Endurance.

INTRODUCTION

The word "Training" has been a part of human language since ancient times. It denotes the process of preparation for some tasks. Some experts, especially belonging to sports medicine, understand sports training as basically doing physical exercises. Several terms used in training e.g. strength training, interval training, technical and tactical training reflect his time of thinking (Singh, 1991).

Intermittent exercises of various types are best known where they have been employed as components to endurance sports. Disciplines such as distance running, road cycling racing, and mountain biking require the body to produce the energy necessary for physical performance through the aerobic energy system, which primarily utilizes stores of carbohydrate products, in the form of glycogen reduced, as energy is required, to the sugar glucose. To generate energy, the body through the cardiovascular system transports oxygen and other nutrients essential to muscle function. The greater the ability of the heart to pump blood volume to the muscles, the likely more efficient the production of energy and the removal of wastes such as carbon dioxide will be.

Intermittent exercise programs will tend to increase the oxygen transporting capacity of the body, often referred to as by the shorthand $VO_2\max$. As a further general rule, the more the intense of the intermittent period of training, the greater will be the $VO_2\max$. By illustration, suppose two equally athletically talented and physically fit cyclists are monitored over a training period of six months. One cyclist maintains a set exercise program of 60 minutes per day. The other cyclist rides the same distances at the same speed as the first for four days per week; his or her remaining three workouts are higher intensity, intermittent workouts of four 15-minute segments—each separated by rest intervals of five minutes from the intermittent training the cyclist would expect to obtain an increase in measured $VO_2\max$ levels in the range of 5-15% (Cooper, 2009).

Aerobic exercise is the exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. There are several kinds of aerobic exercise which are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming up period, followed by at least 20 minutes of moderate to intense exercise, involving large muscle

groups, and a cooling down period at the end.

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength and cardio – vascular fitness). It is usually performed by music and may be practised in a group setting led by an instructor, although it can be done solo and without musical accompaniment. With the goal of preventing illness and promoting physical fitness, practitioners perform various routines comprising a number of different dance-like exercises. Formal aerobic classes are divided into different levels of intensity and complexity. Aerobics classes may allow participants to select their level of participation according to their fitness level. Many gyms offer a wide variety of aerobic classes for participants. Each class is designed for a certain level of experience and taught by a certified instructor with a specialty area related to their particular class (Cooper, 2009).

METHODOLOGY

For this study forty five (N=45) men Volleyball players who have participated University of Madras inter collegiate Volleyball tournament during the year 2013-2014, were selected as subjects. The age of the subjects were ranged from 17 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent Intermittent Training, Group-II underwent Aerobic Exercise, and Group III acted as Control. The Experimental groups underwent their respective training for 12 weeks in addition to the regular training as per College curriculum. Speed Endurance and Muscular Endurance was selected as dependent variables. Speed Endurance was assessed by 150 meters run test and Muscular Endurance was assessed by Sit & Reach Test.

The data collected from the Experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

The Analysis of covariance (ANCOVA) on Speed Endurance and

Muscular Endurance of Experimental Groups and Control group have been analyzed and presented in Table -1.

Table - 1
Analysis of Covariance for Experimental Groups and Control Group on Speed Endurance and Muscular Endurance

Certain Variables	Adjusted Post test Means			Source of Variance	Sum of Squares	df	Mean Squares	‘F’ Ratio
	Intermittent Training Group – (I)	Aerobic Exercise Group – (II)	Control Group – (III)					
Speed Endurance	7.37	7.09	6.99	Between	1.15	2	0.57	1092.00*
				With in	0.22	41	0.001	
Muscular Endurance	41.01	37.79	28.73	Between	1217.68	2	608.84	73.38*
				With in	340.17	41	8.30	

* Significant at.05 level of confidence

(The table value required for Significance at 0.05 level with df 2 and 41 is 3.23)

Table-1 shows that the adjusted post test mean value of Speed Endurance and Muscular Endurance for Intermittent training, aerobic exercise, and control groups, are 7.37, 7.09, 6.99, 41.01, 37.79 and 28.73 respectively. The obtained F-ratio of 1092.00 and 73.38 for the adjusted post test mean is more than the table value of 3.23 for df 2 and 41 required for significance at 0.05 level of confidence. The results of the study indicate that there are significant differences among the adjusted post test means of experimental groups and control group on Speed Endurance and Muscular Endurance.

To determine which of the paired means had a significant difference, Scheffe’s test was applied as Post hoc test and the results are presented in Table 2.

Table - 2
The Scheffe’s test for the differences between the adjusted post tests paired means on Speed Endurance and Muscular Endurance

Certain Variables	Adjusted Post test Means			Mean Difference	Confidence Interval
	Intermittent Training Group (I)	Aerobic Exercise Group (II)	Control Group (III)		
Speed Endurance	7.37	7.09	---	0.28*	0.02
	7.37	14	6.99	0.38*	
	---	7.09	6.99	0.10*	
Muscular Endurance	41.01	37.79	---	3.22*	2.67
	41.01	---	28.73	12.28*	
	---	37.79	28.73	9.06*	

* Significant at.05 level of confidence

Table-2 shows that the adjusted post test mean difference on Speed Endurance and Muscular Endurance between Intermittent training group and aerobic exercise group, intermittent training group and control group, aerobic exercise group and control group are 0.28, 0.38, 0.10, 3.22, 12.28 and 9.06 respectively and they greater than the confidence interval value 0.02 and 2.67, which shows significant differences at 0.05 level of confidence.

It may be concluded from the results of the study that there is a significant difference in Speed Endurance and Muscular Endurance between the adjusted post test means of Intermittent training group and aerobic exercise group, intermittent training group and control group, aerobic exercise group and con-

trol group. However, the improvement in Speed Endurance and Muscular Endurance was significantly increased for intermittent training group than aerobic exercise group and control group.

It may be concluded that the intermittent training group is better than the other aerobic exercise group and control group in improving Speed Endurance and Muscular Endurance.

The adjusted post test means values of Experimental groups and control group on Speed Endurance and Muscular Endurance are graphically represented in the Figure -1 & Figure-II.

FIGURE -1
BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF SPEED ENDURANCE

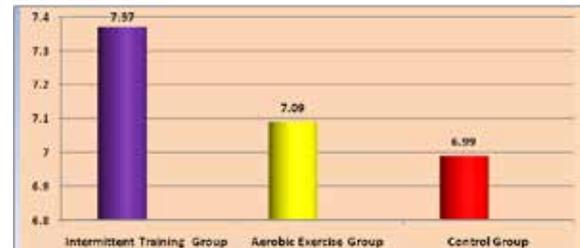


FIGURE -2
BAR DIAGRAM ON ORDERED ADJUSTED MEANS OF MUSCULAR ENDURANCE



RESULTS AND DISCUSSION

Rao et al., (2013) concluded that combined effect of high intensity intermittent training and weight training is efficient enough to improve aerobic capacity, anaerobic capacity and reduces the rate of decline in sprint among male handball players. Arockiaraj (2010) concluded that high Intensity Interval training group had significantly improved Speed, Agility, Explosive Power, Resting Pulse Rate, Respiratory Rate, Cardio Respiratory Endurance, Anxiety and Aggression.

Barnabass (2012) found high Intensity Intermittent Training Group was found to be better than the continuous running Group and Control Group in developing Speed, Agility, Flexibility, Systolic Blood Pressure, Diastolic Blood Pressure, and

Cholesterol (TC), Triglycerides (TGL), High Density Lipoproteins Cholesterol (HDL), Low Density Lipoproteins Cholesterol (LDL) and Very Low Density Lipoproteins (VLDL). **MacDougall *et al.*, (1998)** pointed out Sprint Interval training shows better aerobic and anaerobic power performance. Hughes *et al.* (2002), established that High Intensity interval training techniques were the best for improving cyclic ability and aerobic capacity.

Recent research indicated that when two types of intermittent training and aerobic exercises were compared, there was significant difference between two groups from the statistical aspect. In more precisely phrase, Intermittent training have favorable effects on Speed Endurance and Muscular Endurance in teenagers in which can be proved, since the equal intermittent training and aerobic exercise were applied in every two type of recent research training protocol.

CONCLUSIONS

From the analysis of the data, the following conclusions are drawn.

1. The Experimental groups namely intermittent training and aerobic exercise groups had shown significant improvement in selected Speed Endurance and Muscular Endurance.
2. Significant differences in achievement were found among intermittent training and aerobic exercise groups in all the Endurance parameters such as Speed Endurance and Muscular Endurance.

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