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Effect of aerobic training on physical fitness components of hockey players

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Abstract
The purpose of the study was to find out the effect of aerobic training on Physical Fitness components of hockey Players. For the purpose of study, 40 subjects were selected from Karnataka. Cardiovascular efficiency was calculated by applying Harvard Step Test. The test was conducted by girl's high school. Recorded for each and every subject. Cardiovascular efficiency was calculated to measure Physical Fitness of subjects. The descriptive Statistical mean was calculated to measure the cardiovascular efficiency of hockey Players. The result of the study revealed that there was a significant change in the Cardio-Vascular efficiency of cricket players.

Keywords: cardiovascular efficiency, aerobic training, physical fitness, exercise

Introduction
Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performances in sports competitions. In the light of the meaning and definitions of sports training, the aim of sports training is to improve rapidly the sports performance of a sportsperson particularly in sports competitions, which is mainly based on his physical, psychological, intellectual and technical capacities and capabilities, In other words, the aim of sports training in competitive sports is to prepare the sports persons for the attainment of highest possible sports performance in competition.

Aerobic training
Any physical activity that causes you to breathe harder and increases your heart rate than at rest in presence of oxygen is aerobic exercise. The positive effects of regular aerobic exercise on health have been demonstrated in many studies. Nevertheless, the effects of physical activity on the different body systems differ depending on duration intensity, number of sessions, type of exercise, and age. Dynamic aerobic exercise is defined as rhythm misconstructions of skeletal muscle, with an intensity that would not produce an accumulation of lactate in blood, and could be maintained at least 20 minutes. Aerobic metabolism increases in proportion to the mass of muscle involved and the intensity of exercise. Blood flow also increases many folds. Cardiac output and heart rate increase three to four times with increasing oxygen uptake, whereas stroke volumes increases only to a minor extent. Repeated performance of dynamic aerobic exercise produces a training effect. The benefits are then maintained after the exercise is completed. Benefits obtained in the resting state are lower.

Blood pressure, improved blood lipid profiles, and better heart efficiency. Generally, aerobic training promotes adaptations in the skeletal muscles, the cardiovascular system, the autonomic nervous system, and the hormonal responses. The responsiveness of an individual towards aerobic training is highly heritable and is determined genetically [1]. There is an increase in concentration of enzymes for the citric acid cycle, for fatty acid oxidation, and for the electron transport system. Now research has revealed that on exposure to aerobic exercise, endocrine functions of contracting muscles promote secretion of Myokines which is beneficial in the growth of new tissue, tissue repair and various anti- inflammatory functions]. The net result is an augmentation of the metabolic capacities that are associated with the International Journal of Physical Education, Sports and Health Mitochondria (and the respiratory capacity) and an increase in the use of fat as a source of energy. Aerobic exercise enables the use of oxygen to adequately meet energy demands during exercise via Aerobic metabolism. There is an increase in capillarization of the trained muscles; with both a greater number of capillaries per muscle fiber and a decrease of the area supplied by a single capillary. The Cardiovascular adaptations include a greater stroke volume and maximum cardiac output, and an enhanced ability to lower peripheral resistance during strenuous exercise. One of the most important consequences of the adaptation is the shift to greater reliance on fat as a fuel for muscular exercise. This occurs with glycogen-sparing effect that contributes to greater endurance capacity and with a reduction in plasma triglyceride concentration and an increase in high-density lipoprotein (HDL) mass, especially to increases in HDL2cholesterol and lipoprotein A-I. Aerobic exercise helps in Reducing the risk of diabetes [4].Another important aspect is the psychological benefit of aerobic activity as it reduces anxiety and depression and improves other life areas, including sleeping patterns and occupational satisfaction and efficiency.

Physical Fitness
The state of wellbeing, especially the ability to perform

aspects of sports, occupations and daily activities in efficient manner is referred as physical fitness. It can be achieved through proper nutrition regular physical exercise and sufficient rest. The United States President's Council on Physical Fitness and Sports defined the term physical fitness as "the ability to carry out daily tasks with vigor and alertness without undue fatigue, with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies" (Clarke, 1975). General fitness implies the ability of a person to live most effectively with his/her potential, which depend upon the physical, mental, emotional, social and spiritual components of fitness which are highly interrelated. The primary components of physical fitness identified by the president's Council on Physical Fitness and Sports were muscular strength, muscular endurance and cardio respiratory endurance. However, later on the president council also included some other motor performance components namely agility, speed, flexibility and balance in physical fitness. The goals of an exercise programme will vary from individual to individual. Athletes for e.g. usually view exercise as a means of enhancing their athletic performance. The rest of us however are more likely to be interested in exercise as a mean of improving or maintaining our general health and fitness.

Methodology

The researcher had decided to conduct the study of "Effect of Aerobic training on some physical fitness components of hockey players". For this study it was required to design the experiment. The subjects were selected from vijayapur girl's high school. The subjects represent. Forty girl's subjects were selected as subjects for this study and the age group of subjects ranged between 14 – 17 years. The subjects were divided into two groups (experimental and control group) consisting of 20 subjects each. The subjects were selected by using simple random sampling method. The experimental group was given six weeks (42 days) aerobic training and no training was given to the control group. The study was delimited to a single component of physical fitness i.e. cardiovascular endurance. The data was collected before and after the end of six weeks program by administering Harvard Step Test for measuring cardio vascular efficiency.

Analysis and Interpretation

Data was statistically analyzed using descriptive statistics. The descriptive statistics of the data on 40 subjects demonstrated the Physical Efficiency Index (PEI) range from 81.52 –115.93. PEI was calculated by applying the formulae;

$$PEI = \frac{100 \text{ x (duration of exercise in seconds)}}{2 \text{ x (Sum of recovery pulse count)}}$$

Immediately after completing exercise and having one minute of rest the pulse of subjects was counted as 1 – 1 ½, 2 - 2 ½and 3 – 3 ½.

Table 1: Mean values of cardiovascular efficiency

	Mean	
Control group	Pre test	95.736
	Post test	96.010
Experimental group	Pre test	95.510
	Post test	99.088

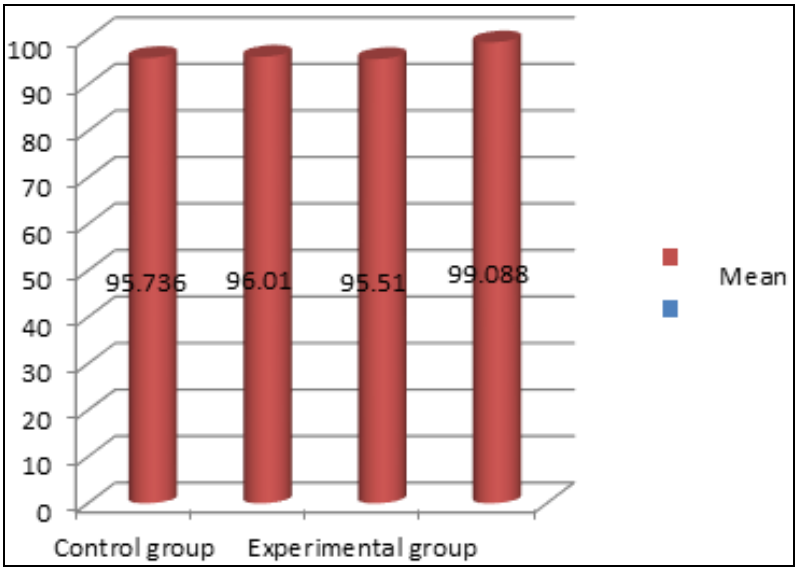

Fig 1: Bar Diagram Shows the Mean Values of Cardiovascular Efficiency. Both Table 1 and Fig 1. Shows that there was not any significant change in the mean scores of Control Group Pre-Test and Post-Test. While as there is a significant difference in the mean scores obtained from the experimental group Pre-Test and Post-Test.

Discussion on Findings

The purpose of the study was to find out the effect of aerobic training on physical fitness components among hockey players of vijayapur. The Experimental Group were given 42 days

aerobic training in the morning session at vijayapur. The study will help to reduce the undue fatigue among players and help coaches at the time of selection of players and later on introducing new exercises in aerobic training program to develop cardiovascular efficiency among desired subjects. The Cardiovascular endurance showed significant improvement as the planned training program shows the significant effect. Hence Aerobic training program of Six weeks was adequate for cardiovascular endurance.

Conclusion

On the basis of the findings of the study following conclusion can be drawn: The Aerobic training is directly proportional to cardiovascular endurance, as significant change was observed on application of 42 days training program on 40 subjects.

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