



## **Effect of Aerobic Power Training on The Development of VO<sub>2</sub> Max of Male Inter Collegiate Level Players**

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### **Abstract:**

Aerobic power training describes the functional status of the cardio respiratory system, (the heart, lungs and blood vessels). Aerobic capacity is defined as the maximum amount of oxygen the body can use during a specified period, usually during intense exercise. It is a function both of cardio respiratory performance and the maximum ability to remove and utilize oxygen from circulating blood. To measure maximal aerobic capacity, an exercise physiologist or physician will perform a VO<sub>2</sub> max test, in which a subject will undergo progressively more strenuous exercise on a treadmill, from a easy walk through to exhaustion. The individual is typically connected to a spirometer to measure oxygen, and the speed is increased incrementally over a fixed duration of time. The higher a cardio respiratory endurance level, the more oxygen transported to exercising muscles, the longer exercise can be maintained without exhaustion and accordingly the faster they are able to run. The higher aerobic capacity, the higher the level of aerobic fitness. The cooper and multistage fitness tests can also be used to functionally assess aerobic capacity. In most people, aerobic capacity can be improved through a variety of means, including fartlek training.

Energy is derived aerobically when oxygen is utilize substrates obtained from food, and deliver energy to the working muscles. A sports event, or activity that will build cardio respiratory endurance, is termed aerobic when the majority of the energy in the athlete id derived aerobically (aerobic training is without oxygen debt). Aerobic activities that are performed continuously for a minimum of 15 to 20 minutes at a level of 70% to 90% of maximal heart rate; and not less than three times. Athletes requiring a higher level of aerobic fitness (endurance ) will train four to six days a week. Examples of large muscle group activities include walking ,jogging running non-sprint cycling, swimming, and cross country skiing. The present study is to find out the effect of aerobic power training on the development of VO<sub>2</sub> max of inter-collegiate men players. To execute this investigation 30 Inter - Collegiate men players studying physical education course at Ramakrishna Mission Vivekananda University Coimbatore. Their age will be from 20 to 30 years. They were again divided in to two equal groups at a random basis, in which one group is called as control group and other group is called experimental group. The experimental group is treated with aerobic power training for a period of six weeks. VO<sub>2</sub> max is measured by cooper 12 minutes run/walk test. The calculated data were analyze statistically by using t ratio test to determine the differences.

**Keywords :** Aerobic training, Maximal oxygen intake, VO<sub>2</sub> max , aerobic power training.

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### **Introduction**

In the recent trend, over 800 people die every year because of coronary artery diseases (CAD) which is the number one killer in the world. The risk factor includes inactivity, High cholesterol level, Smoking, High blood pressure, Diabetes and obesity. Diabetes and obesity. By developing the aerobic fitness, the risk factors can be reduced. In this chapter, let us discuss on aerobic power training which enhances the performance as well as reduces the risk factors.

#### ***Aerobic Training***

The critical feature of aerobic activity is continuous activity. And, specificity of training (SAID) dictates that the training should closely resemble the activity, or event; Runners should run, swimmers swim, fox example. Thus, to improve cardiovascular endurance;

The athletes should train aerobically and systematically for long period athletes involved in activities with a low aerobic component, such as football, power event in track, sprint in running, swimming, and cycling, may see a decrease in power and strength with excessive aerobic training. These athletes should limit their aerobic training to the early preparation of off- season training and then engage in a minimal amount of aerobic training to maintain good general fitness.

#### ***Aerobic Power Training***

The degree the with aerobic capacity can be improved by exercise varies vary widely in the human population while the mean response to training is an approximately 17% increase in VO<sub>2</sub> max, in any population there are high responders| who may as much as double their capacity, and low

responders who will see little or no benefit from training. Studies indicate that approximately 10% of otherwise healthy individuals cannot improve their aerobic capacity with exercise at all. The degree of an individual's responsiveness is highly heritable, suggesting that this trait is genetically determined.

Aerobic capacity is one physiological measure that seems (and with good reason) to attract our attention. We define aerobic capacity as the amount of oxygen delivered to the working muscles per unit of time (i.e. liters of O<sub>2</sub> per minute). However, it's obvious that factors such as growth (larger body, larger lung capacity) and maturity (larger muscle mass) have a strong influence on aerobic capacity. Simply, aerobic capacity can change as the result of physical factors without a proportional improvement in the amount of oxygen available per unit of muscle mass. Scientists generally qualify the measurement to reflect these differences; one's aerobic capacity is generally interpreted in terms of milliliters of oxygen per minute per kilogram of body weight

(i.e. ml/kg/min).

### ***Maximal Oxygen Uptake (VO<sub>2</sub> Max)***

VO<sub>2</sub> max is maximal oxygen uptake which indicates aerobic fitness – the ability to sustain work for prolonged periods. Aerobic fitness is related to health. Fit people are usually healthier than unfit ones. VO<sub>2</sub> max is the best way to measure the aerobic fitness of an individual. The test consists of walking/running on a treadmill, or cycling on a bicycle ergo meter at increased loads, for 12 to 15 minutes. The oxygen used during the maximal effort is the maximal oxygen uptake (VO<sub>2</sub> max). The higher the VO<sub>2</sub> max the fitter is the individual. VO<sub>2</sub> max is the maximum amount of oxygen in milliliters, one can use in one minute per kilogram of body weight.

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## **Methodology**

To achieve the purpose of these study thirty inter-collegiate men players were randomly selected from department of physical education, Ramakrishna Mission Vivekananda University, Coimbatore and their age was ranged from twenty years to thirty years. They were again divided in to two equal group at a random basis, in which one group was called as control group and other group was called experimental group.

### ***Experimental Design***

The selected 30 subjects were divided into two equal groups. One group was kept as control group and another group was called experimental group. The experimental group was treated with aerobic power training for a period of six weeks.

### ***Collection of data***

The selected thirty subjects were divided in to two equal groups. One was the control group and another was the experimental group. Initial test was taken for both groups on selected variables and the reading were carefully recorded in their respective units as per test scores. After pretest the experimental group was treated with aerobic power training for a period of six weeks whereas no treatment was given to control group. After six weeks of treatment all the players was tested again on selected variable and the reading were carefully recorded in their respective units as post test scores. Both the pre test and post test scores were taken for analysis with appropriate statistical tools.

### ***Statistical Technique***

The statistical technique of t-ratio was used to find out the effect of aerobic power training on the development of VO<sub>2</sub> max of Inter-Collegiate women players. Pre-test and post test were collected on VO<sub>2</sub> max, to find out the significant mean difference resulting from the experiment.

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## **Analysis of data and result of the study**

The purpose of the study was to find out the effect of aerobic power training on the development of VO<sub>2</sub> max of inter collegiate women players. To achieve the aim of this study, thirty players were selected, out of them; fifteen students were selected for experimental group and fifteen students for control group. The players were selected from Department of physical Education, Ramakrishna Mission Vivekananda University. All the subjects (N=15) were tested on selected criterion variables prior to the training and after the training. To find out the significance of the difference between the means on the selected criterion variables 't-test' was applied. The level of significance was fixed at 0.5 level of the confidence which was considered adequate for the purpose of the study.

### **TABLE – 1**

#### **COMPUTATION OF 't' RATIO BETWEEN PRE AND POST TEST SCORES OF EXPERIMENTAL GROUP IN MAXIMAL OXYGEN UPTAKE**

S. No	Group	Mean	Standard Deviation	Mean Difference	't' Ratio
1	Pre test	28.82	6.65	1.01	5.44*
2	Post test	29.83	6.80		

\*Significant at 0.05 level of confidence.

Table 1 shows that mean value of pre-test, and post test of maximal oxygen uptake were

28.82 and 29.83 respectively. The obtained at 0.05 level of confidence. Since the obtained t' value was greater than the table value, it shows that there was a significant difference that exists between pre-test and post test on maximal oxygen uptake.

**TABLE – 2**

**COMPUTATION OF 't' RATIO BETWEEN PRE AND POST TEST SCORES OF CONTROL GROUP IN MAXIMAL OXYGEN UPTAKE**

S. No	Group	Mean	Standard Deviation	Mean Difference	't' Ratio
1	Pre test	27.95	5.35	0.06	0.27*
2	Post test	27.89	5.58		

\*Significant at 0.05 level of confidence.

Table 2.2 shows that mean value of pre-test, and post – test of maximal oxygen uptake were

27.95 and 27.89 respectively. The obtained t' value was 0.27 which was lesser than the required

table value of 2.14 for significant at 0.05 level of confidence.

Since the obtained t' value was lesser than the table t' value, it shows that there was not

significant difference that exists between pre-test and post – test on maximal oxygen uptake.

**FIGURE – I**

**GRAPHICAL REPRESENTATION OF INDIVIDUAL COMPARISON BETWEEN PRE AND POST TEST ON MAXIMAL OXYGEN UPTAKE**



## Conclusions

Based on the results and discussion made into the previous chapter, the following conclusions were drawn. There was significance difference between pre test and post test values of experimental group on maximal oxygen uptake . And three was insignificant difference between pre test values of control group on maximal oxygen uptake. Hence it was concluded that there was significant effect of aerobic power training on maximal oxygen uptake of inter collegiate women players.

## References

- 1] Barry I. Johnson and Jack K. Nelson, (1982) Practical measurements for evaluation in physical education, 3rd (Delhi, subject publications) p.215
- 2] E. Willgoose (1961) Evaluation in Health and Physical Education New York; Mc.Graw Hill Book Company, p.17
- 3] Charles A. Bucher, (1983) Foundation of physical Education and Sports, London; C.V. Mobsy company P.642

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- 4] **Charles H. Mc. Cloys (1950)** Test and Measurement in health and Physical education *3rd edition, new York, p. 168*
  - 5] **Clarke and Clarke, (1970)** Research process in Physical Education, Recreation and Health, p.202
  - 6] **David H. Clarke and H. Harrison Clarke (1970)** Research process in Physical Education, *Recreation and Health, ( Englewood cliffs, new jersey: Prentice Hall, Inc.),p. 157*
  - 7] **Meyer T et al. (2004)** 'Is lactic acidosis a cause of exercise induced hyperventilation at the respiratory compensation point?' *Br J Sports Med 38, 622-625*
  - 8] **Lucia A et al. (2004)** 'Which laboratory variable is related with time trial performance time in the Tour de France?' *Br J Sports Med 38 636-640*
  - 9] **McCurdy K et al. (2004)** 'The reliability of 1- and 3RM tests of unilateral strength in trained and untrained men and women' *Journal of Sports Science and Medicine 3(3), 190-196, Sep 2004*
  - 10] **Brockett CL (2001)** 'Human hamstring muscles adapt to eccentric exercise by changing optimum length' *Medicine & Science in Sports & Exercise. 33(5), 783-790, May 2001*
  - 11] **Horstmann T et al. (2001)** 'Metabolic reaction after concentric and eccentric endurance-exercise of the knee and ankle' *Medicine & Science in Sports & Exercise. 33(5), 791-795, May 2001*
  - 12] **Ivy JL (2004)** 'Regulation of muscle glycogen repletion, muscle protein synthesis and repair following exercise' *Journal of Sports Science and Medicine 3(3), 131-138, Sep 2004*
  - 13] **Saunders MJ et al. (2004)** 'Effects of a Carbohydrate-Protein Beverage on Cycling Endurance and Muscle Damage' *Medicine & Science in Sports & Exercise. 36(7) 1233-1238, July 2004*
  - 14] **Hoffmann JR and Falvo (2004)** 'Protein - Which is best?' *Journal of Sports Science and Medicine 3(3), 118-130, Sep 2004*