



COPY RIGHT



ELSEVIER
SSRN

2023 IJIEMR. Personal use of this material is permitted. Permission from IJIEMR must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copyrighted component of this work in other works. No Reprint should be done to this paper, all copy right is authenticated to Paper Authors

IJIEMR Transactions, online available on 18th May 2023. Link

[:http://www.ijiemr.org/downloads.php?vol=Volume-12&issue=Issue 05](http://www.ijiemr.org/downloads.php?vol=Volume-12&issue=Issue 05)

10.48047/IJIEMR/V12/ISSUE 05/67

Title **COMBINED EFFECT OF SHORT TERM AEROBIC AND ANAEROBIC TRAINING INDUCED ADAPTATIONS ON AEROBIC AND ANAEROBIC POWER OF UNTRAINED MEN**

Volume 12, ISSUE 10, Pages: 704-708

Paper Authors **Dr. I. Devi Vara Prasad**



USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per **UGC Guidelines** We Are Providing A Electronic Bar Code

COMBINED EFFECT OF SHORT TERM AEROBIC AND ANAEROBIC TRAINING INDUCED ADAPTATIONS ON AEROBIC AND ANAEROBIC POWER OF UNTRAINED MEN

Dr. I. Devi Vara Prasad

Assistant Professor,

Co-ordinator,

Department of Physical Education and Sports Sciences,

Andhra Kesari University

Ongole, Prakasm Dt, Andhra Pradesh

idvprasadjyothsna@gmail.com

ABSTRACT

The purpose of the study was to investigate the combined effect of short term aerobic and anaerobic training programme on aerobic and anaerobic power among untrained men. Forty untrained men were selected as subjects. The age, height and weight of the subjects ranged from 18 to 24 years, 160 to 171 centimeters and 55 to 66 kilograms respectively. The selected subjects were randomly assigned into two equal groups of 20 subjects each. Group-I performed short term aerobic and anaerobic training for four weeks and group-II acted as control. The dependent variables selected were aerobic capacity and anaerobic power respectively. The collected data from the two groups prior to and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). The analysis of data revealed that four weeks of short term aerobic and anaerobic training had an impact of 1.54% on aerobic capacity, 1.76% on anaerobic power.

Key words: Aerobic and anaerobic training, Untrained men

INTRODUCTION

The aerobic training holds a very conspicuous place in the field of training methods, because it is one of the most powerful methods that ensure and improve the health, endurance and so on. The objective of aerobic training is to develop the energy production system(s) to meet the demands of the event. For continuous exercise, ATP must be re-synthesised at the same rate as it is utilised. Aerobic training has been proved to be best training for endurance, especially so-called "interval-training" has been the subject of many pedagogic and medical paper. The focus of aerobic training is to progressively overload the

cardiorespiratory system and not the musculoskeletal system. This elevates breathing and consequently the heart rate. A typical aerobic fitness workout lasts about 45 minutes to an hour. The intensity of an aerobic workout is measured in terms of the heart rate and exertion level. Adequate warming up and cool down exercises should be part of any aerobic fitness workout.

Aerobic capacity describes the functional capacity 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. Furlan et al., (1993) stated that the experimental group improved their cardio respiratory fitness, whereas the control group exhibited no such changes.

Anaerobic exercise works on particular muscles and their size, endurance, and power. Weight lifting and resistance training are some of the examples of anaerobic exercise. This form of exercise offer many benefits and is a good complement to our aerobic exercise. It may also increase bone thickness. Anaerobic metabolism, or anaerobic energy expenditure, is a natural part of whole-body metabolic energy expenditure. (Scott, 2005) Fast twitch skeletal muscle (as compared to slow twitch muscle) operates using anaerobic metabolic systems, such that any recruitment of fast twitch muscle fibers will lead to increased anaerobic energy expenditure. Intense exercise lasting upwards of about four minutes (e.g., a mile race) may still have a considerable anaerobic energy expenditure component. Anaerobic energy expenditure is difficult to accurately quantify, although several reasonable methods to estimate the anaerobic component to exercise are available.

METHODOLOGY

Subjects and Variables

Forty untrained men were selected as subjects from Acharya Nagarjuna University. The age, height and weight of the subjects ranged from 18 to 24 years, 160 to 171 centimeters and 55 to 66 kilograms respectively. The selected subjects were randomly assigned into two equal groups of 20 subjects each. Group-I performed short term aerobic and anaerobic training and group-II acted as control. One mile run/walk test was used

to assess the aerobic capacity and Margaria–Kalamen anaerobic power test was used to assess the anaerobic power.

Training Protocol

The experimental group performed the aerobic and anaerobic training programs three sessions per week on alternative days for 4 weeks. The subjects performed anaerobic training for proposed repetitions and sets, alternating with active recovery between repetition and complete rest between set based on work-rest ratio. The subject's training zone was computed using Karvonen formula and it was fixed at 70%HRmax to 95%HRmax. The training intensity was progressively increased once in two weeks. The aerobic training consists of 20-40 minutes running 2-3 times per week with 65- 80% HRR. The running intensity was determined by a percentage of heart rate reserve (HRR). The duration of each session were increased once in a weeks as training progressed. The work rest ratio of 1:2 between sets and 1:1 between repetitions was given.

Experimental Design and Statistical Technique

The experimental design in this study was random group design involving 40 subjects. The subjects were divided at random in to two groups of twenty each. Both the groups selected from the same population. The collected data from the two groups prior to and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA).

Results

The pre and post test data collected from the short term aerobic and anaerobic training and control groups were analysed and presented in table – I

Table – I: Analysis of Covariance on Aerobic Capacity of Experimental and Control Groups

	Experimental group	Control Group	So V	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	2472.75	2471.25	B	22.50	1	22.50	0.006
SD	62.64	59.82	W	14.2567.5	38	3751.77	
Post test Mean	2510.75	2471.75	B	15210.00	1	15210.00	5.25*
SD	55.28	52.27	W	109977.50	38	2894.14	
Adjusted Post test Mean	2510.48	2472.01	B	14791.68	1	14791.68	5.96*
			W	91704.88	37	2478.51	

(Table value required for significance at 0.05 level of confidence with df 1 & 37 and 1 & 38 is 4.11 and 4.10.) *Significant at .05 level of confidence

Table-I shows that the pre-test means and standard deviation on aerobic power of short term aerobic and anaerobic training group and control group are 2472.75 ± 62.64 and 2471.25 ± 59.82 respectively. The obtained 'F' ratio value is 0.006 of aerobic power was less than the required table value of 4.10 for the degrees of freedom 1 and 38 at 0.05 level of confidence.

The post-test means and standard deviation on aerobic power of short term aerobic and anaerobic training group and control group are 2510.75 ± 55.28 and 2471.75 ± 52.27 respectively. The obtained 'F' ratio value is 5.25 of aerobic power was greater than the required table value of 4.10 for the degrees of freedom 1 and 38 at 0.05 level of confidence.

The adjusted post-test means on aerobic power of short term aerobic and anaerobic training group and control group are 2510.48 and 2472.01 respectively. The obtained 'F' ratio value is 5.96 of aerobic power was greater than the required table value of 4.11 for the degrees of freedom 1 and 37 at 0.05 level of confidence. Hence it was concluded that due to the effect of four weeks of short term aerobic and anaerobic training the aerobic power of the subjects was significantly improved.

The data collected before and after the experimental period on anaerobic power of short term aerobic and anaerobic training group and control group were analysed and presented in table – II

Table – II: Analysis of Covariance on Anaerobic Power of Experimental and Control Groups

	Experimental group	Control Group	SoV	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	122.10	121.85	B	0.62	1	0.62	0.14
SD	2.14	2.08	W	170.35	38	4.48	
Post test Mean	124.25	121.95	B	52.90	1	52.90	8.49*
SD	2.88	2.03	W	236.70	38	6.23	
Adjusted Post test Mean	124.20	121.99	B	48.33	1	48.33	8.48*
			W	210.85	37	5.69	

(Table value required for significance at 0.05 level of confidence with df 1 & 37 and 1 & 38 is 4.11 and 4.10.) *Significant at .05 level of confidence

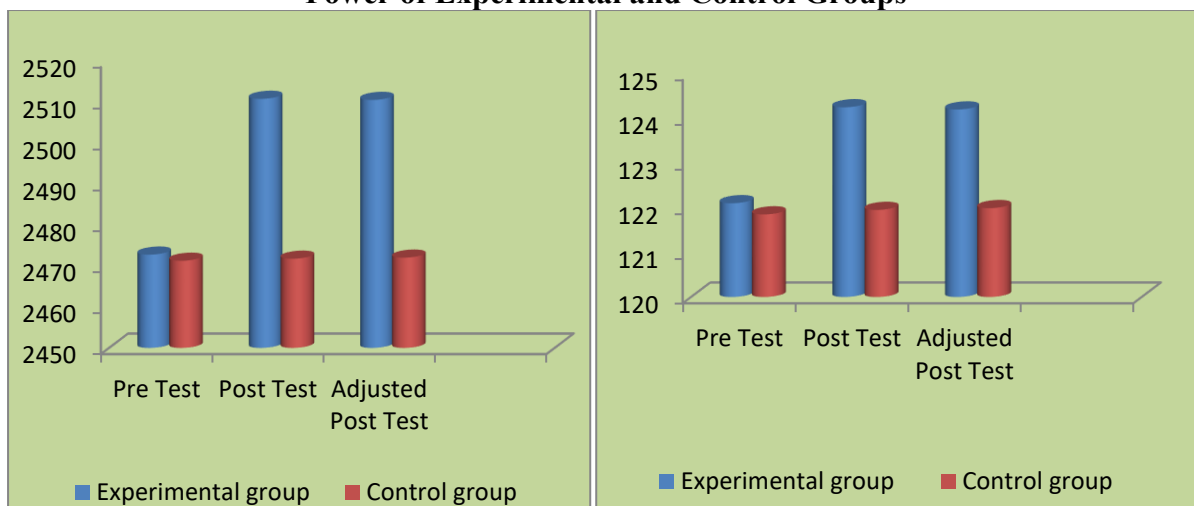
Table-II shows that the pre-test means and standard deviation on anaerobic power of short term aerobic and anaerobic training group and control group are 122.10 ± 2.14 and 121.85 ± 2.08 respectively. The obtained 'F' ratio value is 0.14 of anaerobic power was less than the required table value of 4.10 for the degrees of freedom 1 and 38 at 0.05 level of confidence.

The post-test means and standard deviation on anaerobic power of short term aerobic and anaerobic training group and control group are 124.25 ± 2.88 and 121.95 ± 2.03 respectively. The obtained 'F' ratio value is 8.49 of anaerobic power

was greater than the required table value of 4.10 for the degrees of freedom 1 and 38 at 0.05 level of confidence.

The adjusted post-test means on anaerobic power of short term aerobic and anaerobic training group and control group are 124.20 and 121.99 respectively. The obtained 'F' ratio value is 8.48 of anaerobic power was greater than the required table value of 4.11 for the degrees of freedom 1 and 37 at 0.05 level of confidence. Hence it was concluded that due to the effect of four weeks of short term aerobic and anaerobic training the anaerobic power of the subjects was significantly improved.

Figure – I: Diagram Showing the Mean Value on Aerobic Capacity and Anaerobic Power of Experimental and Control Groups



DISCUSSION

The results of the study showed that the aerobic capacity and anaerobic power have significantly improved due to the four weeks of short term preseason aerobic and anaerobic training programme. Aerobic training results in the improvement of functioning of various

organs and system of the human body. This in turn improves the ability to recover quickly from training and competition load. At the same time aerobic activities enable the sportsmen to better resist the fatigue i.e., to delay the fatigue. The ability to withstand fatigue and to recover faster from fatigue enables the sportsmen to tackle higher training volumes with higher

intensity in a training session, week, month or year. Higher training load leads to improvement in performance. Driller Matthew (2009) showed an 8.2 second improvement in 2000m rowing time following 4 weeks of HIIT in well-trained rowers. Kolata, Gina (2002) indicated that approximately 10% of aerobic power can improve by healthy individuals with short term exercise. A number of physiological changes exist with anaerobic training as well, and will show the large difference between the two and what benefit each one is. Anaerobic training increases the size of the fast twitch muscle fibers versus the slow twitch.

CONCLUSIONS

Four weeks of short term aerobic and anaerobic training had an impact of 1.54% on aerobic capacity and 1.76% on anaerobic power.

REFERENCES

- Driller Matthew., Fell James., Gregory John., Shing Cecilia., Williams Andrew.,(2009). "The effects of high-intensity interval training in well-trained rowers", *International Journal of Sports Physiology and Performance*, 4: 1.
- Furlan, R., Piazza, S., & Dell Orto, S., (1993). Early and late effects of exercise and athletic training on neural mechanisms controlling heart rate, *Cardiovascular Research*, 27: 482-488.
- Kolata Gina., (2002). "Why Some People Won't Be Fit Despite Exercise", *The New York Times*.
- Scott Christopher, B., (2005). "Contribution of anaerobic energy expenditure to whole body thermogenesis", *Nutrition & Metabolism*, p. 2-14.