



Effect of Short Term Endurance Training on Vo_2 Max of Elite University Players

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Abstract

VO_2max or maximal oxygen uptake is one factor that can determine an athlete's capacity to perform sustained exercise and is linked to aerobic endurance. Athletes continually strive to push their capacity to exercise harder and longer and increase their endurance. Short-term endurance training consists of at a steady, but fairly high intensity just slightly higher than "race pace" for a shorter duration, usually 20-30 minutes at a steady pace. The purpose of this study was to examine the influence of short-term endurance training on vo_2 max of elite university players. For these purpose 30 university players, aged eighteen to twenty two years took part in the study. Subjects were randomly assigned to short-term endurance training ($n=15$) or control ($n=15$) group. The training regimen lasted for three weeks. The selected dependent variable vo_2 max assessed by using standard tests and procedures, before and after the training regimen. Analysis of covariance was used to determine the significant difference existing between pre-test and post-test on vo_2 max. The analysis of data revealed that three weeks of short-term endurance training had an impact of 8.36% on vo_2 max.

Keywords: Training, Short-term endurance training, Physiology and Vo_2 max.

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Introduction

Influence of 2 weeks of exercise training, 4 days per week, 40 minutes per session, at 80-85% heart rate reserve, on cardio respiratory fitness and vagal modulation of the heart. The initial values obtained for the cardiorespiratory variables and heart rate variable are consistent with other studies using participants of similar fitness levels (Furlan et al. 1993). The influence of training, participants in the treatment group improved their cardiorespiratory fitness, as indicated by an 8% increase in vo_2 max, whereas the control group exhibited no such changes in this parameter. Numerous studies show that you can increase your vo_2 max by working out at an intensity that raises your heart rate to between 65 and 85% of its maximum for at least 20 minutes three to five times a week. A mean value of vo_2 max for male athletes is about 3.5 litres/minute and for female athletes it is about 2.7 litres/minute.

Driller Matthew (2009) showed an 8.2 second improvement in 2000m rowing time following 4 weeks of HIIT in well-trained rowers. This equates to a significant 2% improvement after just 7 interval training sessions. The interval training used by Driller and colleagues involved 8 x 2.5 minute work bouts at 90% of vo_2 max, with individualized recovery intervals between each work bout.

Methodology

The purpose of this study was to examine the influence of short-term endurance training on vo_2 max of elite university players. For these purpose 30 university players, aged eighteen to twenty two years took part in the study, Annamalai University, with their consent. The selected subjects were healthy and normal, and they were physically fit enough to undergo the short term endurance training. The selected dependent variable vo_2 max was assessed by using standard tests and procedures, prior to and immediately after the training protocol. A six litres Wet Spirometer was used for measuring the vo_2 max. The objective of this test was to measure the largest quantity of air, which a person can expel from the lungs by a forcible expiration after the deepest possible inspiration. The 3 weeks of endurance exercise training consisted of 30 minutes of running. Each exercise bout consisted of a 5-minute "warm-up" period, followed by 20 minutes of running of first week, second week and third weeks at a heart rate of 60-65, 65-70 and 70-75% of heart rate reserve respectively, and ended with a 5-minute "cool-down" period. The experimental group underwent three-weeks of endurance running training, whereas the Control group was asked to maintain their previous level of physical activity. Training was performed four days per week (Monday, Tuesday, Thursday, and Friday). Exercise intensity was closely observed by researcher. The experimental design used for the study was random group design involving thirty subjects, who were divided at random into two groups such as short-term endurance training group and

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control group of fifteen each. The data collected from two groups prior to and after experimentation on $VO_{2\max}$ was statistically examined by applying the analysis of covariance (ANCOVA) with the help of SPSS package.

In determining the significance of 'F' ratio the confidence interval was fixed at 0.05 level, which is considered appropriate enough for the study.

Results

Table I. Analysis of Covariance on $VO_{2\max}$ of Short-Term Endurance Training Group and Control Groups

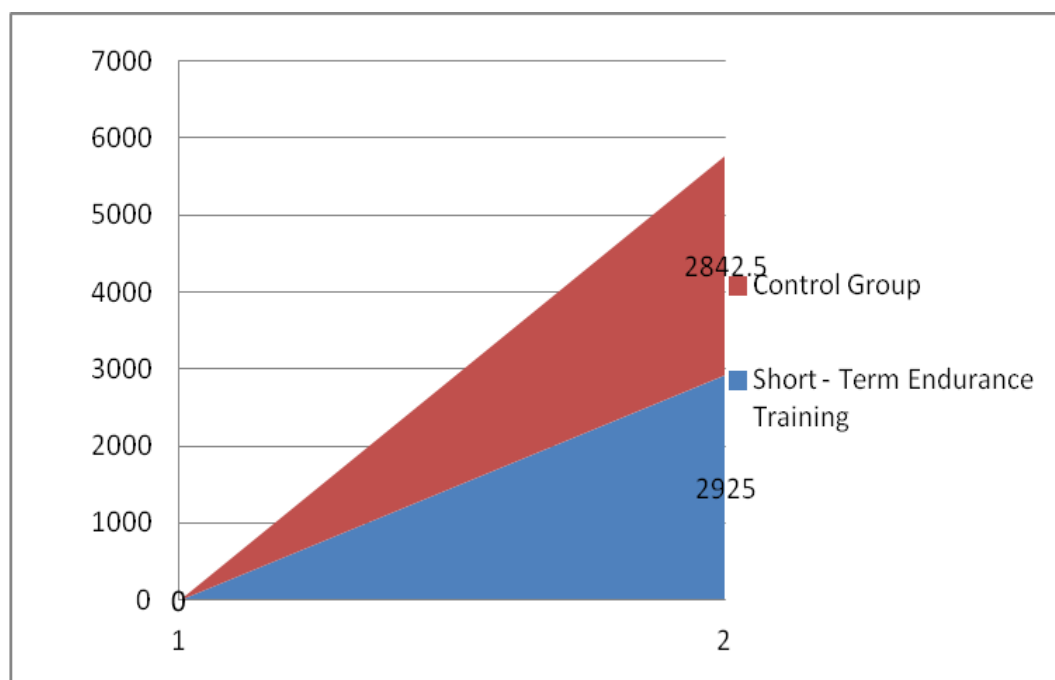
	Short-term endurance training group	Control Group	Source of variance	Sum of Squares	df	Mean squares	'F' ratio
Pre test	2836.66	2848.33	Between	1020.83	1	1020.83	.78
Mean SD	39.94	31.94	Within	36616.67	28	1307.74	
Post test	2996.66	2853.33	Between	154083.30	1	154083.30	81.68*
Mean SD	56.53	24.03	Within	52816.66	28	1886.31	
Adjusted Post test	2999.94	2850.06	Between	163889.20	1	16389.20	107.09*
Mean			Within	41320.98	27	1530.41	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

The adjusted post-test means on $VO_{2\max}$ of short-term endurance training and control groups are 2999.94 and 2850.06 respectively. The obtained 'F' ratio value of 107.09 of adjusted post-test data on $VO_{2\max}$ is

greater than the table value of 4.21 required for significance at 0.05 level of confidence with degrees of freedom 1 and 27.

Figure I. Area diagram shows the adjusted post test mean values on short-term endurance training and control groups



Discussion

The study was to investigate the influence of short-term endurance training on VO_2 max development. The following studies supported my findings. Short-term training with elite players has resulted in improvements in maximal oxygen uptake VO_2max (Convertino. 1983; Nadel. 1985; Green et al.. 1991a). Associated with this improvement in VO_2max , has been an increase in plasma volume (Convertino. 1983; Nadel. 1985). Development of VO_2 max can be performed successfully within a few weeks with repeated sprint and/or sports-specific activities with or without ball (Finn, 2001).

Conclusions

Short-term endurance training induced adaptations to improve exercise performance. New and varied forms of training are being developed and utilized routinely. The results of my study revealed that the VO_2 max, have improved significantly due to short-term endurance training programme for three weeks. Further research is needed to determine the scientific basis for the improvements of VO_2 max, respiratory muscle and exercise performance.

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