Influence of Extensive and Intensive Interval Training and Detraining On Anaerobic Power of College Men

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Abstract

The aim of this study was to find out the effect of extensive and intensive interval training and detraining on anaerobic power of college men students. 60 college men were selected from different colleges. Prior to the experiment the subjects were assessed of their anaerobic power, which formed the initial scores. The subjects were then given 6 weeks extensive interval training (EIT), after the completion of EIT, the subjects were given intensive interval training (IIT) for 6 weeks, after the completion of IIT, the subjects were allowed to continue without any training for 3 weeks, which was considered as short term detraining period and then they were allowed to undergo further detraining period of 3 weeks, which was considered as long term detraining for this study and scores on anaerobic power was obtained after completion of each phase. The influence of extensive and intensive interval training and detraining effects were determined by the initial scores, after extensive interval training scores, after intensive interval training scores, after short term detraining scores and after long term detraining scores of the subjects. The statistical tool repeated analysis of variance (Repeated ANOVA) was used. The results proved significant improvement due to extensive and intensive interval training and there was no significant reduction during short and long term detraining phases. It was concluded that college men could safely utilize extensive and intensive interval training for their improved all round physical fitness.

KEYWORDS: Extensive Interval Training, Intensive Interval Training, Detraining, Anaerobic Power

INTRODUCTION

Athletes from different sports and games are interested in improving their strength, speed, cardiovascular endurance through application through different forms of physical exercises and training. Interval training is a type of discontinuous physical training that involves a series of low- to high-intensity exercise workouts interspersed with rest or relief periods (Heyward, Vivian H. (2006) . The high-intensity periods are typically at or close to anaerobic exercise, while the recovery periods may involve either complete rest or activity of lower intensity. Thus, interval training can be described as short periods of work followed by rest with the aim to improve speed and cardiovascular fitness.

High-intensity interval training (HIIT) is an enhanced form of interval training, an exercise strategy alternating periods of short intense anaerobic exercise with less-intense recovery periods. These short, intense workouts provide improved athletic

capacity and condition, improved glucose metabolism, and improved fat burning (Perry, Christopher G.R. et.al. (2008) . The extensive interval training constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are medium or large exertion periods within the basic endurance range or within the strength endurance range with the duration of the recovery periods being half as long as those of the exertion periods. The extensive interval training constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are medium or large exertion periods within the basic endurance range or within the strength endurance range with the duration of the recovery periods being half as long as those of the exertion periods. It is important to note that the recovery periods must not result in full recovery. (Parameswari and Elayaraja (2010) Faude O, et.al. (2013) compared the endurance effects of high-intensity interval training (HIIT) with high-volume running training (HVT) during pre-season conditioning in 20 high-level youth football players and found both training programmes seem to be promising means to improve endurance capacity in high-level youth football players during pre-season conditioning. Buchan DS, et.al. (2013) examined whether a high intensity training (HIT) intervention and found significant enhancements ($P \leq 0.05$) in vertical jump performance, 10 m sprint speed and cardiorespiratory fitness and concluded high intensity exercise interventions may be used in the school setting for adolescents as a means of improving measures of physical fitness. Sandbakk O, et.al. (2013) tested whether a long duration of aerobic high-intensity interval training is more effective than shorter intervals at a higher intensity in highly trained endurance athletes and found a long duration of aerobic high-intensity interval training improved endurance performance and oxygen uptake at the ventilatory threshold more than shorter intervals at a higher intensity. Nytrøen K, et.al. (2012) demonstrated that a long-term, partly supervised and community-based HIIT-program is an applicable, effective and safe way to improve VO(2peak) , muscular exercise capacity and general health. Parameswari and Elayaraja (2010) evaluated the effects of intensive and extensive interval training on selected physiological parameters and found there was a significant mean difference exists among intensive interval training group (IITG), extensive interval training group (EITG) and control group (CG) on cardio respiratory endurance and breath holding time.

The theoretical foundations laid proved that extensive and intensive interval training could significantly improve speed and cardio-respiratory endurance of the athletes and adolescents. There is further scope for research to find out how far anaerobic power of college men would be affected due to extensive and intensive interval training and whether detraining process could eliminate the improved anaerobic power, if so to what extent are the research interest dealt in this article.

METHODOLOGY

The aim of this study was to find out the effect of extensive and intensive interval training and detraining on anaerobic power of college men students. For this purpose, the investigator randomly selected 60 college men were selected from different colleges in Chennai. Prior to the experiment the subjects were assessed of their anaerobic power

using Margaria Kulaman Anaerobic Test, which formed the initial scores. The subjects were then given 6 weeks extensive interval training (EIT) and the scores on anaerobic power was recorded. After the completion of EIT, the subjects were given intensive interval training (IIT) for 6 weeks. After the completion of IIT, the subjects were measured of their anaerobic power. There after the subjects were allowed to continue without any training for 3 weeks, which was considered as short term detraining period and the anaerobic power was measured after short term detraining period. Further the subjects were allowed to undergo further detraining period of 3 weeks, which was considered as long term detraining for this study and scores on anaerobic power was obtained after long term detraining phases. The influence of extensive and intensive interval training and detraining effects were determined by the initial scores, after extensive interval training scores, after intensive interval training scores, after short term detraining scores and after long term detraining scores of the subjects. The statistical tool repeated analysis of variance (Repeated ANOVA) was used to find out the significance of the differences and Scheffe's post hoc analysis was used when significant F value was obtained.

RESULTS

Tab 1: Descriptive Statistics Due to Extensive and Intensive Interval Training and Detraining on Anaerobic Power

S.No	Different Phases of Training	Mean	Standard Deviation
1	Initial Scores (IS)	75.85	8.86
2	After Extensive Interval Training (AEITS)	79.66	9.76
3	After Intensive Interval Training (AIITS)	80.31	8.06
4	Short Term Detraining (STDS)	79.83	7.51
5	Long Term Detraining (LTDS)	78.58	7.94

Tab 2: Computation of Repeated Measures ANOVA due to Extensive and intensive Interval Training and Detraining on Anaerobic Power of College Men

Source	Sum of Squares	df	Mean Squares	F
Subjects	17707.22	55		
Trials	768.03	4	192.01	11.59*
Residual	4971.06	240	16.57	

Total	21910.26	299		

Table F value required at 0.05 level 2.45
* Significant

As shown in Table I, the initial Anaerobic Power test mean score (IS) of the college men was 75.85, after 6 weeks extensive interval training (AEITS) mean score of Anaerobic Power was 79.66, the scores obtained after 6 weeks intensive interval training (AIITS) mean was 80.31, the scores obtained after 3 weeks short term detraining (STDS) mean was 79.83, the scores obtained after 3 weeks, long term detraining (LTDS) mean was 78.58. The obtained F value 11.59 was greater than the required table F value of 2.45 to be significant at 0.05 level (Table 2). Hence, it was proved that there was a significance difference Anaerobic Power due to extensive and intensive interval training and short term detraining and long term detraining phases. Since significant differences were found, the obtained results were further subjected to post hoc analysis using Scheffe's test

Tab 3: Multiple Comparisons Showing Pairs of Means Scores of Anaerobic Power under Extensive and Intensive Interval Training and Detraining Phases

Mean Scores Under Different Phases					Mean Difference	Reqd C.I
IS	AEITS	AIITS	STDS	LTDS		
75.85	79.66				3.81*	2.33
75.85		80.31			4.46*	2.33
75.85			79.83		3.98*	2.33
75.85				78.58	2.73*	2.33
	79.66	80.31			0.65	2.33
	79.66		79.83		0.17	2.33
	79.66			78.58	1.08	2.33
		80.31			0.48	2.33
		80.31		78.58	1.72	2.33
			79.83	78.58	1.25	2.33

* Significant at 0.05 level

IS: Initial Score; AEITS: After Extensive Interval Training Score; AIITS: After Intensive Interval Training Score; STDS : Short Term Detraining Score; LTDS : Long Term Detraining Score

DISCUSSIONS

The descriptive statistics due to extensive, intensive interval trainings, short and long term detraining effects showed differences in means and while testing for the significance of the differences, the obtained F value was found to be significant ($P<0.05$).

The post hoc analysis proved that comparing to initial scores there was significant improvement in anaerobic power due to extensive interval training, intensive interval training. Though there was a small reduction in anaerobic power due to short term and long term detraining, the reduction was not significant comparing to initial scores. It was also found that the differences between after extensive interval training scores, there was small improvement due to intensive interval training, and small reduction due to short term and long term detraining, however, the differences were not significant. Similarly it was found that the differences between after intensive interval training scores and reduction due to short term and long term detraining were not significant. Thus, the findings proved that the mean gains due to extensive and intensive interval training was on anaerobic power was not reduced during detraining phases among the college men. Sandbakk O, et.al. (2013) found a long duration of aerobic high-intensity interval training improved endurance performance and oxygen uptake at the ventilatory threshold more than shorter intervals at a higher intensity. Nytrøen K, et.al. (2012) found HIIT-program improved VO(2peak) , muscular exercise capacity and general health. Parameswari and Elayaraja (2010) found there was a significant mean difference exists among intensive interval training group (IITG), extensive interval training group (EITG) and control group (CG) on cardio respiratory endurance and breath holding time. These findings proved that extensive and intensive interval training contributed for the improvement of endurance, cardio respiratory endurance, which contributed for the anaerobic power of the subjects. Thus, the findings of this study that extensive and intensive interval training contributed for improved anaerobic power is in agreement with these previous researches. It was concluded that college men could safely utilize extensive and intensive interval training for their improved al round physical fitness.

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