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Effects of Tapering on Endurance among Pondicherry University Cricket Players

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Abstract

The purpose of this study was to analyze the effects of tapering on cardiovascular endurance among Pondicherry University inter-collegiate cricket players. Thirty (30) inter-collegiate cricket players were selected at random from Pondicherry University. The ages of the subjects were between 18 and 25 years. Cardiovascular endurance was chosen as the study variable. All the subjects underwent specific cricket training for six weeks. After completion of six weeks' training, the selected subjects were randomly divided into two groups of fifteen each (n = 15). The initial 12-minute run-and-walk test (Cooper test) was conducted for both the groups and the performance was studied. Experimental group 1 underwent linear tapering for 2 weeks and experimental group 2 was not given any treatment (detraining). After 2 weeks, the final test (Cooper test) was conducted for experimental group 1 and experimental group 2. The collected data were analyzed through ANCOVA to find the differences between the groups. The results of the study indicated that the tapering group showed a significant improvement in the selected dependent variable (cardiovascular endurance) when compared to the detraining group. Therefore, tapering the training results in improvement when compared to the detraining group.

Keywords: Tapering, Detraining, Cardiovascular endurance.

Introduction

Endurance is one of the most fundamental physiological parameters for improved performance. It is the ability to carry out tasks for a longer period of time without undue fatigue. This is of great importance to competitors or players in all games, including cricket. Cricket players require a good amount of endurance to perform better as this is a running based game (i.e. while bowling, fielding, scoring runs, etc.) (Campbell, 2013). To achieve higher-level performance in sports and games, physical and physiological fitness training is a proven prerequisite. However, a few weeks before a competition, training is generally stopped, in order to recover from training stress and avoid fatigue. This method is called detraining. In this case, the time that is allowed for detraining should be considered. This is because when the deconditioning period is unduly prolonged, the regaining of performance may be significantly compromised. For example, it was found that reduced training or inactivity for 4 weeks did not cause any decrease in muscular strength, but the ability to generate power decreased drastically (Neufer et al.,1987).

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In other words, reversibility occurs due to the decrease or cessation of optimal training stimuli. Therefore, if the training period is longer, then the detraining should be slower (Moritani & de Vries,1979). To overcome the setbacks in detraining, tapering strategies are being followed. According to Bosquet et al. (2007), tapering is the decrease in the training load of athletes in the last few days before a major competition to optimize performance. The aim of tapering is to alleviate the negative impacts caused during a preparatory phase and meanwhile recover or even increase the physiological capacity. Adjusting the training load and duration of tapering will help develop the adaptation gained during training (Mujika et al., 2004). With regard to tapering for individual sports and events, there are a lot of research studies available. But there are very few studies for team games, especially for cricket. So this study aims at analyzing the effects of tapering on endurance among Pondicherry University inter-collegiate cricket players.

Subjects and Methodology

For the purpose of this study, 30 players were selected randomly from Pondicherry University. The ages of the subjects were in the range between 18 and 25 years. Cardiovascular endurance was selected as the study variable. Certain factors like life style, daily routine, and diet were not taken into account in this

study. Climatic conditions were not taken into consideration. All the subjects underwent specific cricket training for 6 weeks. After completion of 6 weeks' training, the selected subjects were randomly divided into two groups of fifteen each (n = 15); namely, experimental group 1 and experimental group 2 (control). The pre-test (initial 12-minute run-and-walk test; Cooper test) was conducted and the performance was recorded for both the groups. Experimental group 1 underwent linear tapering for 2 weeks and experimental group 2 was not given any treatment (detraining; but they were allowed to participate in their routine physical activities). After 2 weeks, the post-test (Cooper test) was conducted for experimental group 1 and experimental group 2.

Results

Table 1
Analysis of covariance for the pre-test and post-test for the tapering group and detraining group on endurance

TEST	Tapering	De-training	SV	SS	Df	MS	Sig
Pre test	7.15	7.14	Between	1.078	1	1.078	3.388
			Within	8.592	27	.318	
Post test	7.16	6.26	Between	5.965	1	5.965	15.797
			Within	10.195	27	.378	

*Significant at 0.05 level of confidence for (1, 27) is 4.21

Table 1 summarizes the pre and post-test means of cardiovascular endurance for both groups. The pretest means of the tapering group and the detraining group were 7.15 and 7.14, respectively. The obtained F value on the pretest score (3.388) was lesser than the table value (4.21; significant at 0.05 level). It proved that there was no significant difference between the groups at the initial stage and randomization at the initial stage was equal. The posttest means for the tapering group and the detraining group were 7.16 and 6.26, respectively. The obtained F value (15.797) was greater than the table value (4.21), and was significant at 0.05 level. The post-test score analysis proved that there were significant differences between the groups.

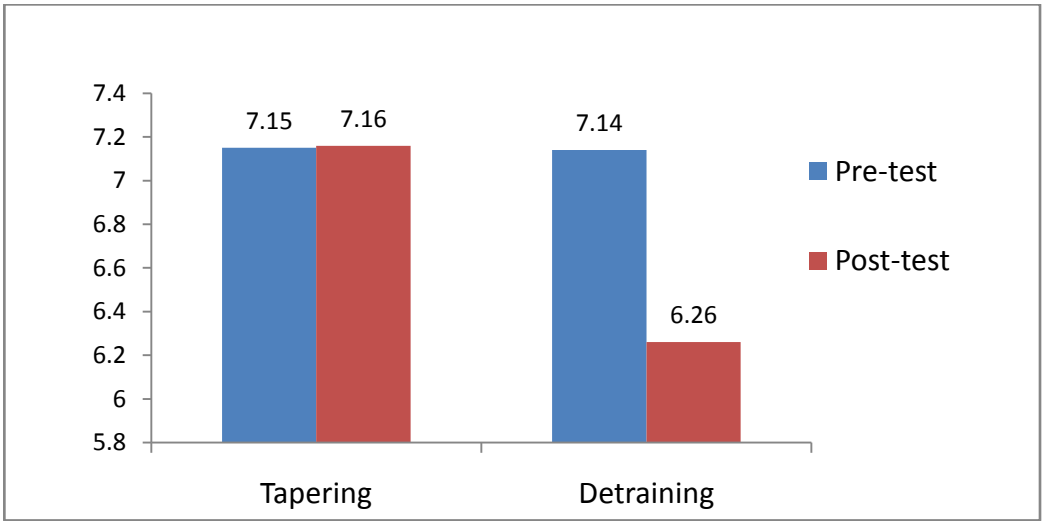

Figure I
Bar diagram showing differences in endurance between the pre-test and post-test for the tapering group and the detraining group

Discussion

Our study findings show that cardiovascular endurance is reduced in the detraining group, while it remains unchanged in the tapering group. The reduction in the detraining group is attributed to the reverse effect. In the tapering group, the continuous stimuli of optimal intensity and duration help in retaining the improvements gained (by maintaining muscle anaerobic potential and high aerobic capacity). Vigorous training until the day before a major

competition will lead to overtraining, causing fatigue or muscle soreness. These in turn result in decreased performance. On the other hand, extended down time or detraining before competition will also negatively impact the performance, because of the loss of fitness gains. Moreover, regaining the previous fitness levels will take even more time. A series of physiological changes occur when training is stopped: decrease in cardiac output, glycogen levels in muscles, and metabolism, consequently resulting in decrease in endurance. It is important to improve performance while maintaining physiological adaptations achieved during the training period and bring down the negative impacts. Therefore, tapering is the best solution. Studies have also shown increase in muscle glycogen, muscle strength & power, and VO2max – and thus muscle endurance after tapering (Mehranpour et al., 2016).

Whether tapering or complete rest should be applied is determined by the training load. More training load leads to greater muscular adaptation; this is also accompanied by higher levels of fatigue/psychological stress. Therefore, a greater reduction in training load over a longer period is needed (Thomas & Busso, 2005).

Conclusion

In summary, the present study on the effects of tapering on cardiovascular endurance among Pondicherry University inter-collegiate cricket players revealed that the tapering group maintained the performance when compared with the detraining group. The detraining group showed a significant decrease in the performance of the selected variable. These results clearly indicate that tapering overcomes the drawbacks of both overtraining (because tapering provides adequate recovery from training stress & fatigue) and detraining (in that tapering maintains training-induced physiological adaptations) and helps in achieving optimal performance. This study will therefore provide insight into tapering and its benefits for athletes to maintain their performance and also useful for physical education professionals, sports trainers and coaches. Further research can be designed to investigate the effects of training programmes based on age, gender and other fitness variables (like strength, flexibility, etc.) and using different types of taper.

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