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Analysis of the Assisted and Resisted Sprint Training on Anaerobic Power among Kabaddi players

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Abstract

The purpose of the present study was to find out the analysis of the assisted and resisted sprint training on anaerobic power among male kabaddi players. For this purpose, thirty male kabaddi players from Annamalai University, Annamalainagar, Chidambaram, Cuddalore District, Tamilnadu aged 18 to 24 years took part in the study. Subjects were randomly assigned to assisted sprint training group (n=10), resisted sprint training group (n=10) and control (n=10) group. The training regimen lasted for three days per week for twelve weeks. The assisted sprint training exercises included in this training programme was downhill sprinting, assisted towing and high speed treadmill sprinting. The resisted sprint training exercises included in this training programme was weighted vest, sprint parachutes and harness running. The criterion variable selected was anaerobic power and it was assessed by using Running based anaerobic power test prior to and immediately after the training. The collected data were statistically treated by using ANCOVA, and 0.05 level of confidence was fixed to test the significance. When the obtained 'F' ratio was significant, Scheffe's post hoc test was used to find out the paired mean difference. The findings of the study revealed that due to the effect of twelve weeks of assisted and resisted sprint training the anaerobic power of male kabaddi players was significantly improved.

Keywords: Assisted and Resisted Sprint Training, Anaerobic Power.

Introduction

Training improves player's performance. Selecting the appropriate training methods to incorporate in our training program is important for a number of reasons. There are several different training methods that can be used to improve player's ability in different sports. How they decide which methods will work best for their sports. What they need to do is to look at the intensity and duration of energy use to chosen sport. Training also results in physical changes in the muscles. These will improve their tolerance for the stresses of prolonged exertion.

In performance and high performance sport, a great importance is given to the physical condition. It is in fact the preoccupation for the adaptation of the sportsman's body to growing physical and mental efforts, to which all the parts of the human body participate. The contemporary Kabaddi game, characterized by high intensity motor activities, places upon players a wide spectrum of requirements on all their capabilities. One can hardly single out any ability or a characteristic which is not engaged in the performance of Kabaddi players.

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Basic and specific motor abilities and cardio-respiratory capacities, such as explosive strength, required at the centre line. As well as agility and speed which are indispensable for the efficient solving of game situations. A high level of aerobic capacity ensures the slower onset of fatigue and a fast recovery, whereas anaerobic capacity is responsible for endurance in high intensity repetitive activities.

Sprinting speed and acceleration can be found in major sports such as soccer, football, baseball, and basketball. Speed is defined as maximal running velocity and is calculated by dividing distance traveled by time, usually expressed as meters per second (m/s). Similarly, acceleration is defined as the rate of change of velocity and is calculated by dividing change in speed by time, usually expressed as m/s/s or simply m/s2. Coaches implement a variety of training programs to increase both components, and athletes are always searching for the best ways to improve their performance. An assortment of different approaches has been implemented to increase speed such as resistance training to increase strength (Mior et al., 2007). Implementation of specific sprint training along with nonspecific methods can increase speed and athletic performance (Young & others, 2001)). In this way, training specificity seeks to promote adaptations with a direct carryover to sport. Two specific sprint speed

programs that are popular with strength coaches are overload or resisted training and over speed or assisted training (Upton et al., 2011)). The comparative effect of assisted and resisted sprint training on anaerobic power has not been analyzed scientifically. Hence, the investigator is motivated to select assisted and resisted sprint training as experimental variables. Resisted training consists of applying an overload via a sled, parachute or weighted vest (Harrison & Bourke, 2009) while assisted training consists of over speed via downhill running, elastic cord assistance or assisted towing (Paradisis el al., 2009). Resisted and assisted training methods result in specific adaptations and performance enhancements. The purpose of this article is to briefly review the current literature related to resisted and assisted sprint training and attempt to elucidate best practices for these two divergent methods for strength and conditioning coaches.

Methodology

Subjects and Variables

For the purpose of the present study was to find out the analysis of the assisted and resisted sprint training on anaerobic power among male kabaddi players. For this purpose, thirty male kabaddi players from Annamalai University, Annamalainagar, Chidambaram, Cuddalore District, Tamilnadu aged 18 to 24 years took part in the study. The selected subjects were randomly assigned to both the experimental and control groups of 10 each. The experimental group-I underwent assisted sprint training and experimental group-II underwent resisted sprint training and group-III acted as control. The selected dependent variable anaerobic power was assessed by using running based anaerobic power test before and after the training regimen.

Training protocol

During the training period the experimental groups underwent their respective training programme three days per week (alternate days) for twelve weeks in addition to their regular programme of the course of study as per their curriculum. The first group performed assisted sprint training and the second group performed resisted sprint training. The assisted sprint training exercises included in this training programme was downhill sprinting, assisted towing and high speed treadmill sprinting. The resisted sprint training exercises included in this training programme was weighted vest, sprint parachutes and harness running. More specifically, the training distance comprised of 50 meters and the initial intensity was fixed at 75% and it was increased once in two weeks by 5%. The subjects performed these runs at maximum relaxed speed with the specified intensity.

Experimental Design and Statistical Procedure

The experimental design used for the present investigation was random group design involving thirty subjects. Analysis of covariance (ANCOVA) was used as a statistical technique to determine the significant difference, if any, existing between pretest and posttest data on selected dependent variable. Whenever, the adjusted posttest 'F' ratio value was found to be significant, Scheffe's post hoc test was applied to find out the paired mean differences. The level of significance was accepted at $P < 0.05$

Result of the study

Table I. Anacova for before training and after training on anaerobic power of experimental and control groups

	Assisted Sprint Training	**Resisted Sprint Training**	**CG**	**SOV**	**SS**	**df**	**MS**	**'F' ratio**
Before Training Mean	97.73	98.25	96.33	B:	29.78	2	14.89	1.30
SD	3.33	1.80	2.78	W:	309.37	27	11.45	
After training Mean	105.49	108.05	96.51	B:	1102.26	2	551.13	25.92*
SD	2.50	2.91	1.16	W:	574.26	27	21.26	
Adjusted Posttest Mean	107.39	105.25	97.41	B:	755.74	2	377.87	18.30*
				W:	536.67	26	20.64	

*Significant F = (df 2,27) (0.05) = 3.35 ; (P ≤ 0.05) and F = (df 2,26) (0.05) = 3.37 ; (P ≤ 0.05)

The adjusted post-test mean on anaerobic power for assisted sprint training group is 107.39, resisted sprint training group is 105.25 and control group is 97.41. The obtained 'F' ratio of 18.30 for adjusted post-test mean is more than the table value of 3.37 required for significance at 0.05 level for df 2 and 26. The results of the study showed that there was a significant difference among three groups on anaerobic power.

Table II. Scheffe's post hoc test for the adjusted post-test paired means difference on explosive power and anaerobic power

	Adjusted Post-Test means				
	Assisted Sprint Training	Resisted Sprint Training	Control group	Mean difference	Confidence interval
Anaerobic power	107.39	105.25		2.14	3.3
	107.39		97.41	9.98*	3.3
		105.25	97.41	7.84*	3.3

***Significant at 0.05 level of Confidence.**

The table II shows that the adjusted post test paired mean difference between assisted sprint training group and resisted sprint training group, assisted sprint training group and control group and resisted sprint training group and control group are 2.14, 9.98 and 7.84 for anaerobic power respectively. They were greater than the confidence interval value of 3.3 at 0.05 level of confidence. It may be concluded from the results of the study that assisted sprint training and resisted sprint training groups have significantly improved the anaerobic power when compared with the control group whereas for anaerobic power there was no significant difference only between the two training groups.

Discussion

Physical activity causes beneficial changes in the functioning of all internal organs, particularly, the heart, lungs and circulatory system. A physically fit person's heart beats at a lower rate and pumps more blood, which denotes the substantial increase of ability to do more physical work. The result of the study showed anaerobic power have increased significantly for assisted sprint training and resisted sprint training as compared to control group. Whereas with regard to anaerobic power both the groups resulted with almost same gain indicating no significance between these two groups. Elastic strength is the combination of speed and strength, assisted sprint training acts as a balance between these two training programmes. This programme helps to improve the speed and strength simultaneously and ultimately there is an increase in anaerobic power. These results are support the observation by Laursen et al., (2005) have stated that, peripheral adaptation rather than central adaptation are likely responsible for the improved anaerobic capacity following various forms of high intensity training. Rodas et al., (2000) have suggested that, training of short duration, high loads and long recovery periods seems to be an effective programme for improving the enzymatic actives of the energetic pathways in a short period of time. MacDougall et al., (1998) have founded that, relatively brief period of sprint training increased aerobic and anaerobic capacities in initially untrained individuals. These results are in agreement with the previous observation by Nowberry & flowers, (1999) have suggested in which they found significant improvement in anaerobic power following speed training. Medbo & Burgers, (1990) have reported that, six weeks of intense exercise of short duration improved anaerobic capacity. They identified that sprinters have better anaerobic capacity than endurance athletes, due to increase in anaerobic energy release. Mahon, (2000) postulated that, factors such as motor neuron firing rate and improved coordination were responsible for enhanced anaerobic power performance.

Conclusion

From the result of the study it was concluded that the anaerobic power of the assisted and resisted sprint training group subjects was significantly improved. However, resisted sprint training is better than assisted sprint training in improving anaerobic power. It demonstrated that the anaerobic power performance can be developed by both assisted and resisted sprint training. Hence, it is suggested that, when properly performed, assisted and resisted sprint training can provide significant functional benefits and improvement in overall health and fitness.

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