

Enhancing Anaerobic Power through Resistance Training: A Study among Athletes

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ABSTRACT

The purpose of the study was to find out the effect of resistance training on anaerobic power among athletes. To achieve the purpose of the present study, thirty athletes from Montfort school, Yercaud, Salem District, Tamilnadu were selected as subjects at random and their ages ranged from 14 to 17 years. The subjects were divided into two equal groups at random. The subjects were divided into two equal groups of fifteen subjects each. Group I acted as Experimental Group (Resistance training) and Group II acted as Control Group. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. Analysis of covariance was computed where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. The level of significance 0.05 was chosen and considered as sufficient for the study. It was observed that the six weeks of experimental group have significantly improved the anaerobic power of athletes.

KEYWORDS: Anaerobic Power, Resistance Training, Athletes, Strength.

INTRODUCTION

Anaerobic power is a critical component of athletic performance, particularly in sports that involve short-duration, high-intensity activities such as sprinting, jumping, and rapid changes in direction. It reflects the ability of the muscles to generate maximum force in a short period of time, primarily through energy systems that do not rely on oxygen, such as the ATP-PC and glycolytic systems. Athletes who possess higher levels of anaerobic power are better equipped to perform explosive movements, which are essential in sports like football, basketball, athletics, and handball. Resistance training has been widely recognized as an effective method for improving muscular strength, power, and overall athletic performance. It involves exercises that cause muscles to contract against an external resistance, leading to physiological adaptations such as increased muscle fiber recruitment, hypertrophy, and improved neuromuscular coordination. These adaptations contribute significantly to the enhancement of anaerobic power (Bompa & Haff, 2009).

Previous research has demonstrated that resistance training plays a vital role in improving explosive performance. According to Kraemer, resistance training enhances both neural and muscular mechanisms, resulting in improved power output and performance. Similarly, studies have shown that structured resistance training programs can significantly improve anaerobic performance measures such as vertical jump, sprint speed, and Wingate test outcomes (Cormie et al., 2011). The relationship between resistance training and anaerobic power is also supported by the principle of specificity, which suggests that training adaptations are closely related to the type and intensity of exercise performed. High-intensity resistance exercises, particularly those involving explosive movements, stimulate fast-twitch muscle fibers, which are primarily responsible for generating anaerobic power (Suchomel et al., 2016). Despite the well-established benefits of resistance training, there is still a need for more focused research examining its direct impact on anaerobic power among athletes from different sports backgrounds. Understanding this relationship can help coaches and trainers design more effective training programs aimed at improving performance and reducing the risk of injury.

METHODOLOGY

The purpose of the study was to find out the effect of resistance training on anaerobic power among athletes. To achieve the purpose of the present study, thirty athletes from Montfort school, Yercaud, Salem District, Tamilnadu were selected as subjects at random and their ages ranged from 14 to 17 years. The subjects were divided into two equal groups at random. The subjects were divided into two equal groups of fifteen subjects each. Group I acted as Experimental Group (Resistance training) and Group II acted as Control Group. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. Analysis of covariance was computed where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. The level of significance 0.05 was chosen and considered as sufficient for the study.

RESULTS AND DISCUSSION

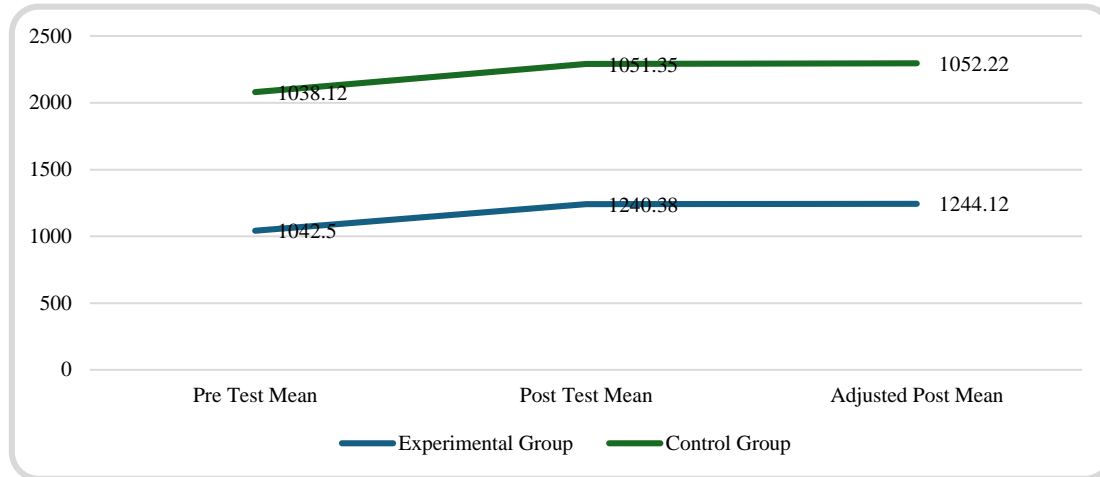
TABLE – II: COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE OF ANAEROBIC POWER OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	1042.50	1038.12	BG	0.60	1	0.60	1.26
			WG	13.26	28	0.47	
Post Test Mean	1240.38	1051.35	BG	35.03	1	35.03	41.54*
			WG	23.61	28	0.84	
Adjusted Post Mean	1244.12	1052.22	BG	32.44	1	32.44	36.01*
			WG	24.32	27	0.90	

* Significant at 0.05 level Table value for df 1 and 28 was 4.20, 1 and 27 was 4.21

The above table indicates the adjusted mean value of anaerobic power of experimental and control groups were 8.12 and 6.07 respectively. The obtained F-ratio of 36.85 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on anaerobic power. The above table also indicates that both pre and post test means of experimental and control groups differ significantly.

FIGURE – I: SHOWS THE MEAN VALUES ON ANAEROBIC POWER OF EXPERIMENTAL GROUP AND CONTROL GROUPS



DISCUSSION

The findings of the present study clearly indicate that assisted sprint training had a significant effect on anaerobic power among athletes. The experimental group showed a marked improvement in anaerobic power compared to the control group after the training period. The Analysis of Covariance (ANCOVA) results revealed that the obtained F-ratio for the adjusted post-test mean (36.01) was much higher than the required table value at 0.05 level of significance. This confirms that the improvement observed in the experimental group was statistically significant. The higher adjusted mean value of the experimental group compared to the control group clearly indicates the effectiveness of assisted sprint training in enhancing anaerobic power. The improvement in anaerobic power may be attributed to the nature of assisted sprint training, which enhances neuromuscular coordination, stride frequency, and fast-twitch muscle fiber activation. Assisted sprinting allows athletes to move at supramaximal speeds, thereby stimulating the neuromuscular system to adapt to higher velocity movements. These adaptations contribute to improved explosive power and energy production through anaerobic pathways. In contrast, the control group did not show any significant improvement in anaerobic power, as they did not undergo any specific training intervention. This highlights the importance of structured and systematic training programs in improving performance-related variables. The findings of this study are supported by earlier research, which suggests that sprint-based and resisted/assisted training methods are effective in improving anaerobic power and speed performance due to enhanced motor unit recruitment and improved muscle activation patterns (Ross et al., 2001; Markovic, 2007).

CONCLUSION

1. It was observed that the six weeks of experimental group have significantly improved the anaerobic power of athletes.

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