

Effect of Circuit Weight Training on Anaerobic Power and Strength Endurance Among Male Football Players

Dr. Ajayakumar Koorma

Associate Professor & Head, Department of Physical Education, S.N. College, Kannur

Abstract - The purpose of the study was to find out the impact of circuit weight training on anaerobic power and strength endurance. Thirty male football players studying in S.N. College, Kannur, Kerala, aged between 17 and 21 years were selected for the study. They were divided into two equal groups, each group consisting of fifteen subjects in which one experimental group and one control group, in which the group I (n=15) underwent circuit weight training for three days (alternative days) per week for twelve weeks, and group II (n=15) acted as control, which did not participate in any training. The subjects tested on selected criterion variables such as anaerobic power and strength endurance at prior to and immediately after the training period. For testing the anaerobic power, Margaria Kalamen Anaerobic Power Test was administered and to measure the strength endurance sit-ups test was administered. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental group and control group on selected criterion variables separately. The selected criterion variables such as anaerobic power and strength endurance were improved significantly for the training group when compared with the control group.

Index Terms - circuit weight training, anaerobic power, strength endurance and ANCOVA.

INTRODUCTION

All around the world, the phrase "sports for all" has gained enormous popularity. "Today, doing sports will improve everyone's physical fitness and overall health. Most aspects of modern life are reliant on science and technology. People in these situations need to exercise more to maintain their physical and mental fitness and do the activity well.[2]

The primary goal of contemporary sports competition is to identify and nurture human potential at an early age and guide it in the proper direction to meet the goals set for certain sports or games. The world of games and sports is always growing due to the

intensity of competition and the growth of human movement research. The method of selecting, screening, and training athletes in a range of sporting activities at the world level has been impacted by technical and scientific innovation.[1]

The improvement of anaerobic capacity may be necessary for a particular sporting event to be successful. The capacity to use anaerobic reserves, balance, mobility, agility, speed, power, body levers, endurance, skills, tactics, intelligence, neuro-muscular coordination, acute hearing, excellent vision, reaction time, experience, perceptual ability, motivation, consent motion, dedication, adequate rest, food, sleep, emotional stability, and many body measurements.[3] Any type of athletic performance is a multifaceted outcome of an athlete's abilities and interactions with their surrounding environment.[4]

In order to answer the question of whether a single program can improve muscular strength and endurance while working the aerobic system, circuit weight training (CWT) was created in the 1950s. With little break in between stations, the goal of CWT is to travel from one training station to the next. CWT programs typically contain 6–12 workout stations that emphasise complete body training. Typically, 2 to 3 sets of each circuit make up a full workout.[5] The program specifically calls for 10-15 repetitions at each station, employing around 40 to 50 percent of a person's one-repetition limit, and then 15 to 30 seconds of recovery time. The coach should employ other methods to bring variation to the program in addition to circuit weight training.[6,7] CWT can be utilised as an introductory program, to keep an athlete's physical strength and endurance up throughout the season, and for injury recovery. A general strength and conditioning program can benefit from the addition of CWT.[9,10]

Strength endurance is defined as the capacity of the whole organism to withstand under the long-lasting

experience of strength. Consequently, it is characterized by a relatively high ability to express strength together with a faculty to preserve.[8]

MATERIALS AND METHOD

The purpose of this study was to determine the impact of circuit weight training on anaerobic power and strength endurance. In order to accomplish the goal, 30 male football players from S.N. College in Kannur, Kerala, were randomly chosen as subjects. They were split into two equal groups of fifteen each. Group I (n = 15) underwent circuit weight training for three days (alternate days) each week for twelve weeks, and Group II (n = 15) acted as control which did not participate in any special training apart from the

regular football coaching activities. For every training program there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables: 1. anaerobic power, 2. Strength endurance.

DATA ANALYSIS

The differences, if any, between the corrected post test means on criteria variables were examined independently using analysis of covariance. To evaluate the "F" ratio discovered using analysis of covariance, the level of significance was set at .05 level of confidence.

Table – I Analysis of Covariance and ‘F’ ratio for Anaerobic power and Strength endurance of Circuit weight training Group and Control Group

Variable Name	Group Name	Circuit Weight Training Group	Control Group	‘F’ Ratio
Anaerobic power (in Kg m/sec)	Pre-test Mean ± S.D.	89.85 ± 3.86	88.26 ± 3.84	0.99
	Post-test Mean ± S.D.	91.13± 3.11	88.86 ± 3.51	3.892*
	Adj. Post-test Mean	92.09	87.95	58.55*
Strength endurance (in No./min)	Pre-test Mean ± S.D.	47.03 ± 1.81	47.60 ± 1.22	0.86
	Post-test Mean ± S.D.	49.99 ± 1.55	47.15 ± 1.86	19.89*
	Adj. Post-test Mean	50.22	47.81	34.62*

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively).

Table – I shows that pre and post test means ‘f’ ratio of circuit weight training group and control group on anaerobic power was 0.99, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean ‘f’ ratio value of experimental group and control group was 6.892 and 58.55 which was significant at 0.05 level of confidence. The pre test means ‘f’ ratio of circuit weight training group and control group on strength endurance was 0.86, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean ‘f’ ratio value of experimental group and control group was 19.89 and 34.62, which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in anaerobic power and strength endurance.

CONCLUSION

1. Anaerobic power were significantly improved for all the training groups, such as, resistance training group and circuit weight training group when

compared with the control group. Rahmi and Behpur, (2005), [12] has found that there was a significant improvement in anaerobic power and strength endurance, after the circuit resistance training.

2. The circuit weight training group has shows their improvement in strength endurance than the control group. Sundaramoorthy (1999) [10] and Mohamed Abd El-Mawgoud Elsayed (2012) [11] found that circuit weight training has improved the anaerobic power of male football players. The result of the study was revealed that the circuit weight training group has significantly improved the selected anaerobic power and strength endurance than the control group.

REFERENCE

[1] Hardayal Singh, “Sports Performance and its Structure”, SNIPES Journal, 5, (April 1984), 14.

- [2] Klaf C.E. and Arnhem, D.D. (1963). *Modern Principles of Athletic Training*, St. Louis: The C.V. Mosby Publishers, p. 93.
- [3] Zatsiorsky, Vladimir M. (1995). *Science and Practical of Strength Training*, Champaign, Illinois: Human Kinetics Publishers, p.79.
- [4] Singh, Hardayal. (1993). *Sports Training, General Theory and Methods*, Delhi: Surjeet Publications, 1993), p.51.
- [5] Corey Crane, Retrieved from www.selfhelpmagazine.com on 10-06-2019.
- [6] Thomas R. Baechle, (1994). *Essentials of Strength Training and Conditioning*, Champaign, Illinois: Human Kinetics Publishers, p. 248.
- [7] Shaw, I. and Shaw, B.S, (2014), “Weight training and the Prevention of Sports Injuries”. In Hopkins G (ed). *Sports Injuries: Prevention, Management and Risk Factors*, (Hauppauge, NY: Nova Science Publishers), ISBN 9781634633055.
- [8] Shaw, B.S and Shaw, I, (2005), “Effect of weight training on cardiorespiratory endurance and coronary artery disease risk”, *Cardiovascular Journal of South Africa*, 16:5, 256-59.
- [9] Shaw, B.S. and Shaw, I. (2009), “Compatibility of concurrent aerobic and weight training on maximal aerobic capacity in sedentary males”, *Cardiovascular Journal of Africa*, 20:2, 104-6.
- [10] Sundaramoorthy, V. (1999). “Effects of Isolated and Combined Circuit Weight and Plyometric Training on Selected Strength Parameters, Speed and Power”, Unpublished Doctoral Thesis, Alagappa University.
- [11] Elsayed, Mohamed Abd El-Mawgoud. (2012), “Effect of Circuit Weight Training on Specific Physical Abilities in Long Jump Athletes”, *World Journal of Sport Sciences*, 7:2, 105 – 108.
- [12] Rahmi, Rahman and Behpur, Nasir. (2005). “The Effect of Plyometric, Weight and Plyometric – Weight Training on Anaerobic Power and Muscular Strength”, *Facta Universitatis, Series: Physical Education*, 3:1, (2005), 81 – 91.