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An Impact of Isolated, Concurrent, Resistance and Plyometric Training on Explosive Power among college athletes

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Abstract

The purpose of the study was to find out the effect of Concurrent, Resistance and Plyometric Training on Explosive power among college athletes. For this purpose Forty five (N=40) athletes studying in Department of Physical Education & Sports Sciences, Annamalai University, Annamalainagar, Tamilnadu were selected as subjects during the academic year 2014-2015. They were randomly divided into four groups of 10 each, Group-I underwent Concurrent Training, Group-II underwent Resistance Training, Group-III underwent Plyometric Training and Group-IV acted as Control. The Experimental groups underwent the respective training for twelve weeks duration. Among various strength parameters only Explosive strength was selected as a dependent variable, and it was assessed through sergeant Jump test. The data obtained from the experimental groups and control groups before and after the experimental period were statistically analyzed with Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post-hoc test to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. Explosive power showed significant difference among the groups, further the results suggested that plyometric training was showed better performance when compare to other experimental and control group.

Keywords: Concurrent Training, Resistance Training, Plyometric Training Explosive power.

Introduction

According to Hakkinen et al., (1998) the strength training in combination with some explosive types of exercises be recommended as a part of overall physical training to maintain the functional capacity in middle-aged and elderly people. For explosive muscle performance, the underlying factors are muscle fiber type, muscle hypertrophy and enzymatic and neural adaptations. It is also important to investigate the impact of power-type strength training on the low back and leg muscles and joints, as well as the injury risks and adherence, and motivation to training. For being effective in improving the explosive muscle performance, training programs should be designed so as to motivate, easy to achieve, effective concerning the time spent in exercises, low in expenses, and they should give consideration to the exercise history and present exercise activity, health status and musculoskeletal symptoms and diseases of the individual.

Combining both resistance strength training and plyometric explosive power training is to use the combination of resistance and plyometric exercises to effectively engage the nervous system and activate more fibers. Ebben (2002) states that resistance training followed by plyometric training alternates biomechanically similar to high load weight training exercises with plyometric exercises. This type of training describes a power-developing workout that combines weights and plyometric exercises. About ten years ago, these workouts were greeted with great acclaim as research indicated that they could significantly enhance fast twitch muscle fiber power and, therefore, produce dynamic sports performance. The logic behind this pair of exercise is that the resistance work gets the nervous system into full action so that type II b fibers are available for the explosive exercise; hence a better training benefit of complex training programme can be used in the general, specific and competitive phase of training.

The actual term 'plyometrics' was first coined in 1975 by Fred Wilt, the American Track and Field coach. The elements ply and metric come from Latin roots for "increase" and "measure" respectively, the combination thus means 'measurable increase"(Baechle, 1994). Plyometrics is the term now applied to exercises that have their roots in Europe, where they were first known simply as jump training. Interest in this jump

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training increased during the early 1970s as East European athletes emerged as powers on the world sport scene. As the Eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics and weight lifting the mystique of their success began to center on their training methods.

Methodology

For this purpose Forty five (N=40) court games players(Volleyball & Basketball) studying in Yadava College Madurai, Tamilnadu were selected as subjects during the academic year 2013-2014 They were randomly divided into four groups of 10 each, Group I underwent Concurrent Training, Group II underwent Resistance Training, Group III underwent Plyometric Training and Group-IV acted as Control. The Experimental groups underwent the respective training for twelve weeks duration. Among various strength parameters only Explosive strength was selected as a dependent variable (Edward and Franks 1997), and it was assessed through sergeant Jump test.

Results and Discussion

The data collected from the Experimental groups and Control group prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Scheffe's test was applied as post-hoc test to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

Table I. Values of Analysis of Covariance for Experimental Groups on Explosive Power

Dependent Variable	Adjusted Post test Means				Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	Concurrent Training Group (I)	Resistance Training Group (II)	Plyometric Training Group (III)	Control Group (IV)					
Explosive Power	41.14	41.28	43.72	39.65	Between Within	85.25 43.31	3 35	28.42 1.24	22.96*

**** Significant at.05 level of confidence***
***(The table value required for Significance at 0 .05 level with df 3 and 35 is 2.87*)**

Table-1 shows that the adjusted post test mean value of Explosive Power for Concurrent training, Resistance training, Plyometric training and control group are 41.14, 41.28, 43.72 and 39.65 respectively. The obtained F-ratio 22.96 for the adjusted post test mean is more than the table value 2.87 for df 3 and 35 required for significance at 0.05 level of confidence. The results of the study indicate that there are significant differences among the adjusted post test means of Experimental Groups on the increase of Explosive power. To determine which of the paired means had a significant difference, Scheffe's test was applied as Post hoc test and the results are presented in Table 2.

Table II. The Scheffe's test for the differences between the adjusted post tests paired means on Explosive Power

Dependent Variables	Adjusted Post test Means				Mean Difference	Confidence Interval
	Concurrent Training Group (I)	Resistance Training Group (II)	Plyometric Training Group (III)	Control Group (IV)		
Explosive Power	41.14	41.28	--	--	0.14	1.11
	41.14	--	43.72	--	2.58*	1.11
	41.14	--	--	39.65	1.49*	1.11

	--	41.28	43.72	--	2.44*	1.11
	--	41.28	--	39.65	1.63*	1.11
	--	--	43.72	39.65	4.07*	1.11

**** Significant at.05 level of confidence***

Table 2 shows that the adjusted post test mean difference of Explosive Power on Concurrent Training and Resistance training, Concurrent training and Plyometric training, Concurrent training and Control group, Resistance training and Plyometric training, Resistance training and Control group and Plyometric training and Control group are 0.14, 2.58, 1.49, 2.44, 1.63 and 4.07 respectively and they are greater than the confidence interval value 0.36, which shows significant differences at 0.05 level of confidence.

It may be concluded from the results of the study that there is a significant difference in Explosive Power between the adjusted post test means of Concurrent Training and Resistance training, Concurrent training and Plyometric training, Concurrent training and Control group, Resistance training and Plyometric training, Resistance training and Control group and Plyometric training and Control group. However, the increase in Explosive Power was significantly higher for Plyometric training group than other Experimental groups. It may be concluded that the Plyometric training group is better than the other Experimental groups in increasing Explosive Power. The adjusted post test mean values of Experimental groups on Explosive Power is graphically represented in the Figure -1.

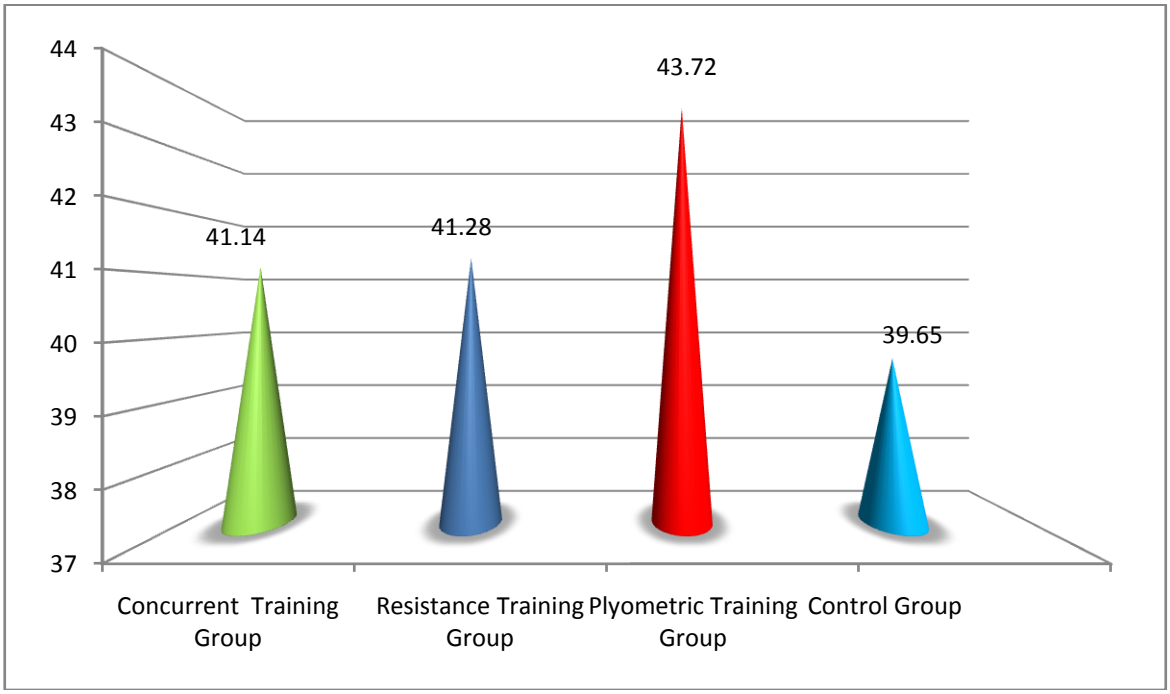

Figure I. The Adjusted Post Tests Mean values of Experimental Groups on Explosive Power

Conclusion

From the analysis of the data, the following conclusions were drawn.

1. The Experimental groups namely, Concurrent training, Resistance training and Plyometric training had significantly improved in Explosive Power.
2. The Plyometric training was found to be better than the Concurrent training, Resistance training in increase Explosive power.

References

1. Baechle., Thomas R(1994). *Essentials of Strength Training and Condition*, Champaign, Illinois: Human Kinetics Publishers.
2. Ebben (2002) Complex Training: A brief review, *Journal of Sports Science and Medicine* 1,42-46.
3. Hakkinen K, Kallinen M, Izquierdo M, Jokelainen K, Lassila H, Malkia E,(1998), Changes in agonist-antagonist EMG, muscle CSA, and force during strength training in middle-aged and older people, *Journal of Applied Physiology*, 84: 1341-9.

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