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Effects of Concurrent Plyometric and Resistance Training Speed of Inter Collegiate Male Athletes

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Abstract:
The purpose of this study was to discover the impacts of concurrent plyometric and resistance training on the development of speed of the inter collegiate level athletes. In view of their preparation, eighty male inter collegiate athletes were chosen from Bangalore University affiliated colleges and they were divided into four equal groups. Group-I - Resistance training (n=20), Group-II - Plyometric Training (n=20), Group -III - Concurrent plyometric and resistance (n=20), Group-IV- Control group (n=20). The purpose was to find out the speed in 50-yard dash test, as measured previously, then after the fact a six-week preparing period. The subjects in each preparation gatherings were prepared for 2 days for every week. While control group subjects did not take part in any preparation action. The data were analyzed by 't' ratio, Analysis of variance, Analysis of co-variance and Scheffe's post-hoc test. The results show that all the training treatments elicited significant ($P<0.05$) improvement in the entire test variable of speed. However, the specific training showed significant improvement in speed. 50 yards' dash test performance showed significantly greater improvement in the other three groups. This study provides support for the use of a concurrent plyometric and resistance Group to improve the speed.
Key words: Concurrent Plyometric, Resistance, Plyometric training, Speed, Analysis of variance, Scheffe's Post-hoc test, Control group.

Introduction

Execution in many games relies upon the interaction between a few physiological components. A test for mentors and competitors is to locate the correct mix and outstanding task at hand of activities during preparing to advance a long haul streamlining of every one of these elements. This is a significant piece of the periodization procedure, which is the division of preparing into stages with various destinations to elevate execution and to maintain a strategic distance from intemperate weakness and overtraining (Smith, 2003). Despite the fact that the goal during one such stage could be quality upgrades by means of opposition preparing (RT), most competitors need to all the while train other physical abilities to maintain a strategic distance from a decrease in execution. Joining obstruction and continuance activities is particularly testing in light of the fact that few examinations have demonstrated that muscle hypertrophy and gains in quality and power are frequently blunted when perseverance activities are added to a RT program (Bell et al., 2000; Dudley and Djamil, 1985; Fyfe et al., 2016; Hakkinen et al., 2003; Hickson, 1980; Kraemer et al., 1995; Sale et al., 1990). The instruments supporting this impedance impact are not surely known but rather likely include a mix of elements influencing both intense and incessant exhaustion just as the activity instigated anabolic reaction (Coffey and Hawley, 2017). Instances of such factors may incorporate diminished neural initiation; aggregation of metabolites, for example, inorganic phosphate, H+ and smelling salts; and consumption of ATP, creatine phosphate and muscle glycogen (Leveritt et al., 1999).

Power is the component most adversely influenced by simultaneous preparing, and studies demonstrate that only a couple of moderately short continuance sessions every week are sufficient to dull power (Hakkinen et al., 2003; Mikkola et al., 2012). Muscle hypertrophy and quality appear to be less adversely influenced, and a low-to-direct volume intense exercise (2–3 sessions/wk, 20–60 min/session) is related with no or just minor blunting impacts (Hakkinen et al., 2003; Lundberg et al., 2013; Shaw et al., 2009; Tsitkanou et al., 2016). In any case, even minor blunting impacts might be hindering for world class competitor execution, and besides, assuming long and additionally visit continuance sessions are added to a RT program there is an enormous assemblage of proof demonstrating that muscle hypertrophy and quality will be undermined (Hickson, 1980; Jones et al., 2013; Kraemer et al., 1995). For instance, Hickson (1980) watched a solid blunting impact on one-reiteration most extreme (1RM) squat movement when running activities (40 min, 6 sessions/wk) were added to a 10-week RT program.

Table-4.1. Significance of Mean Gains / Losses Between Pre and Post Test of Resistance Training Group on Speed of Inter Collegiate Athletes

Variables	Test	Mean	Std. Div.	S.E.M	M.D	't' Ratio
Speed	PRE-TEST	7.27	0.53	0.97	0.50	5.19*
	POST-TEST	6.77	0.48			

Source: Field Study

Table 4.1 shows the obtained 't' ratio's for pre and post test mean difference in the selected variables of Speed (5.19*) respectively. The obtained 't' ratio is when compared with the table value of 2.09 for the degrees of freedom (1, 19) it was found to be statistically significant at 0.05 level of confidence.

Table-4.2. Significance of Mean Gains / Losses Between Pre and Post Test of Plyometric Training Group on Speed of Inter Collegiate Athletes

Variables	Test	Mean	Std. Div.	S.E.M	M.D	't' Ratio
Speed	PRE-TEST	7.24	0.62	0.11	0.26	2.21*
	POST-TEST	6.98	0.54			

Source: Field Study

Table 4.2 shows the obtained 't' ratio's for pre and post test mean difference in the selected variables of Speed (2.21*) respectively. The obtained 't' ratio is when compared with the table value of 2.09 for the degrees of freedom (1, 19) it was found to be statistically significant at 0.05 level of confidence.

Table-4.3. Significance of Mean Gains / Losses Between Pre and Post Test of Concurrent Training on Speed of Inter Collegiate Athletes.

Variables	Test	Mean	Std. Div.	S.E.M	M.D	't' Ratio
Speed	PRE-TEST	7.25	0.51	0.14	0.97	6.75*
	POST-TEST	6.27	0.31			

Source: Field Study

Table 4.3 shows the obtained 't' ratio's for pre and post test mean difference in the selected variables of Speed (6.75*) respectively. The obtained 't' ratio is when compared with the table value of 2.09 for the degrees of freedom (1, 19) it was found to be statistically significant at 0.05 level of confidence.

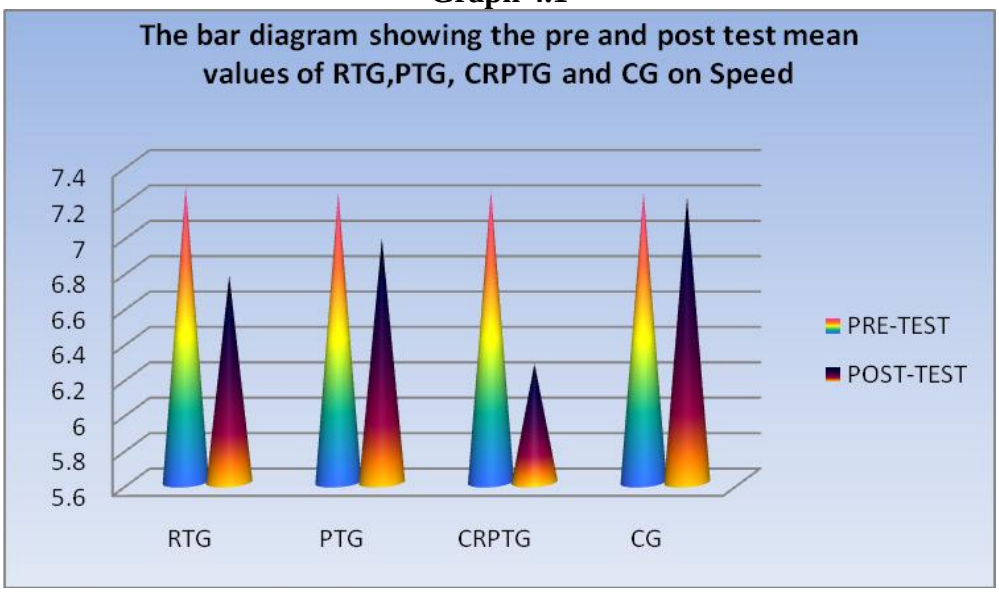
Table-4.4. Significance of Mean Gains / Losses Between Pre and Post Test of Control Group on Speed Inter Collegiate Athletes

Variables	**Test**	**Mean**	**Std. Div.**	**S.E.M**	**M.D**	**'t' Ratio**
Speed	PRE-TEST	7.24	0.52	0.04	0.03	0.69*
	POST-TEST	7.21	0.51			

Source: Field Study

Table 4.4 shows the obtained 't' ratio's for pre and post test mean difference in the selected variables of Speed (0.69*) respectively. The obtained't' ratio is when compared with the table value of 2.09 for the degrees of freedom (1, 19) it was found to be statistically not significant at 0.05 level of confidence.

Graph 4.1



Source: Field Study

Table-4.5. Mean Values of Pre-test, Post-test and Adjusted Post-Test Means of RTG, PTG, CRPTG and CG on Speed of Inter Collegiate Athletes

Test	RTG	PTG	CRPTG	CG	Source of variance	Sum of square	df	Mean square	**'F'**
Pre-test	7.27	7.24	7.25	7.24	**B.G**	0.013	3	0.004	0.01
					W.G	23.14	76	0.305	
Post-test	6.77	6.98	6.27	7.21	**B.G**	9.561	3	3.187	14.34*
					W.G	16.89	76	0.222	
Adjusted post-test	6.76	6.98	6.27	7.21	**B.G**	9.677	3	3.226	21.00*
					W.G	11.51	75	0.154	

Source: Field Study

*0.05 level of significance

Table 4.5 reveals that the obtained 'F' value on pre-test means of Speed was 7.27 for experimental group – I, 7.24 for experimental group – II, 7.25 for experimental group – III and 7.24 for control group. The obtained 'F' ratio 0.08 was lesser than the table 'F' ratio 0.01. Hence the pre test means were found to be not significant at 0.05 level of confidence for the degree of freedom 3 and 76. The post - test means were 6.77 for experimental group – I, 6.98 for experimental group – II, 6.27 for experimental group – III and 7.21 for control group. The obtained 'F' ratio 14.34 was higher than the table 'F' ratio 2.72. Hence the post – test means were found to be significant at 0.05 level of confidence for degree of freedom 3 and 76. The adjusted post – test means were 6.76 for experimental group – I, 6.98 for experimental group – II, 6.27 for experimental group – III and 7.21 for control group. The obtained 'F' ratio 21.00 was higher than the table 'F' ratio 2.72. Hence the adjusted post test means were found to be significant at 0.05 level of confidence for the degrees of freedom 3 and 75. It was concluded that there was a significant mean difference among the resistance training group, plyometric training group, concurrent resistance and plyometric training group and Control Group in developing the Speed of the inter collegiate level athletes.

Table-4.6. The Scheffe's Test for the Differences Between Pared Means on Speed

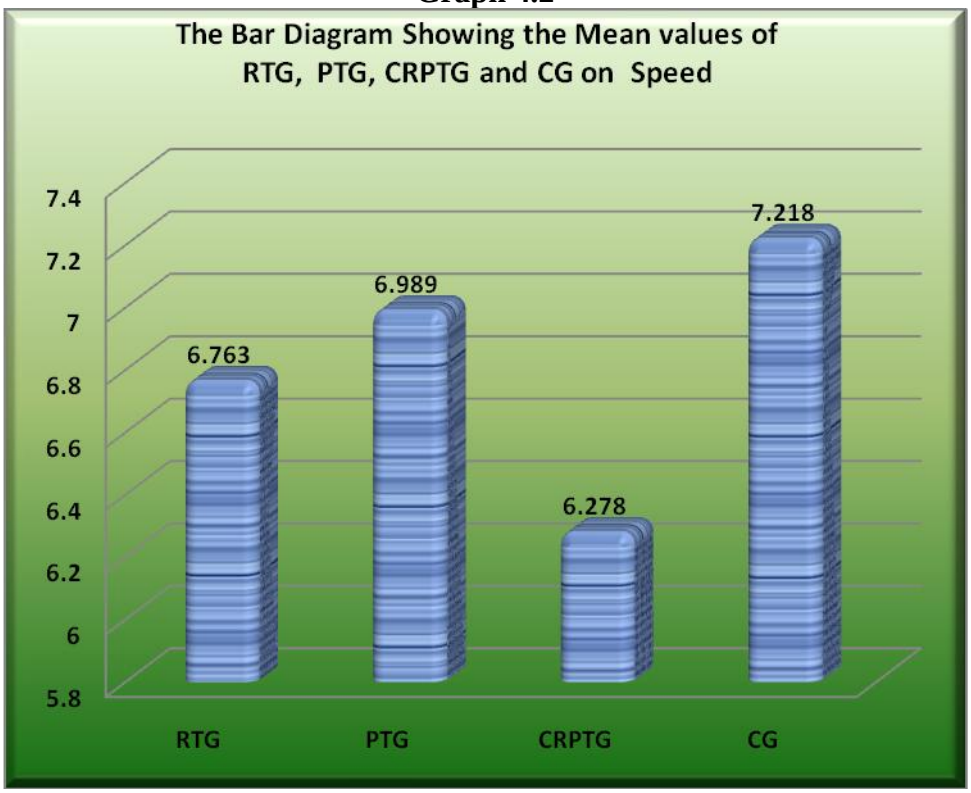
SFTG	***SRFTG***	***CSTSRFTG***	***CG***	***Mean Differences***	***Confidence Interval Value***
6.763	6.989	-	-	0.226	0.35
6.763	-	6.278	-	-0.485	0.35
6.763	-	-	7.218	0.455	0.35
-	6.989	6.278	-	-0.711	0.35
-	6.989	-	7.218	0.229	0.35
-	-	6.278	7.218	0.94	0.35

Source: Field Study

* Significant at 0.05 level of confidence

Table 4.6 shows the post hoc analysis of obtained order adjusted post test means. The confidential interval mean difference required to be significant was 1.27. It was observed that the mean difference values of concurrent resistance and plyometric training group in developing the Speed was significantly higher than the resistance training, plyometric training group and control group. Resistance training group developed the Speed better than the plyometric and control group.

Graph 4.2



Source: Field Study

Scheffe's Test on Speed

Resistance training group, plyometric training group, concurrent resistance and plyometric training group significantly showed improvement in Speed from pre-test to post-test. The Speed decreased in the RTG group from pre test (7.27 ± 0.53) to post test (6.77± 0.48); PTG group from pre test (7.24 ± 0.62) to post test (6.98 ± 0.54); CRPTG group from pre test (7.25 ± 0.51) to post test (6.27 ± 0.31)and there were no change in control group from pre test (7.24 ± 0.52) to post test (7.21 ± 0.51). The Speed significantly showed improvement from pre test to post test in the two Treatment groups and there was no changes in control group.

The present study demonstrated that an increase in Speed of 6.87 %, 3.59 %, 13.38 % and 0.33 % was estimated with 50-meter dash for the Resistance Training group, Plyometric Training group, Concurrent Resistance and Plyometric Training group and Control group respectively. The showed improvement in Speed of 13.38 % by Concurrent Resistance and Plyometric Training group is better than the Resistance Training group, Plyometric Training group and Control group.

Result of The Study

1. It was resulted that the Resistance training significantly improved the Speed of inter collegiate athletes.
2. It was resulted that the Plyometric training significantly improved the Speed of inter collegiate athletes.
3. It was resulted that the Concurrent Resistance and Plyometric Training group significantly improved the Speed better than the Resistance Training group, Plyometric Training group and Control group of inter collegiate Athletes.

Conclusion

1. It was concluded that the Resistance training significantly improved the Speed of inter collegiate athletes.
2. It was concluded that the Plyometric training significantly improved the Speed of inter collegiate athletes.
3. It was concluded that the Concurrent Resistance and Plyometric Training group significantly improved the Speed better than the Resistance Training group, Plyometric Training group and Control group of inter collegiate Athletes.

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