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Effects of Sprint and Circuit Training on the Development of Agility and Flexibility of the Inter-Collegiate Male Athlete

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Abstract

The purpose of the study is to find out the Effects of combination of Sprint Training and Circuit Training on the development of Agility and Flexibility of the Inter Collegiate Level Male Athletes. Sixty athletes from the various colleges in Karnataka are selected as subjects and their age ranged from 18 to 22 years. The subjects are divided into three equal groups. The first group undergoes Sprint Training (n=20), the second group undergoes Circuit Training alone (n=20) and the third group act as the Control Group. They do not practice any specific training. The selected variables are assessed by agility (Illinois agility test) and flexibility (sit and reach test) conducted before and after the 12 weeks of training regimen. The data are analyzed by t test, co-variance and it is significant so the scheffee's post hoc test is applied. The sprint training group shows significantly greater improvement in the agility and flexibility than the other two groups of the circuit training group and the control group.

Keywords: Agility, Flexibility, STG- Sprint Training Group, CTG-Circuit Training Group, CG (Control Group).

Introduction

The goal of Sprint Training is to maximize the utilization of the stored energy is producing a stronger and faster contraction. It is done by training the transition between the concentric and eccentric contraction. It is possible to train the body to make the most use of the stretch shortening cycle. In the vertical jumping the athlete is instructed to perform the landing for the takeoff position as fast as possible. Other examples include rope jumping, triple jumping, box jumping (variations of jumping on and off "plyo boxes"), and hurdle jumping. According to Dr. Judith Flohr from Jamej Madison University (Zoll), muscular strength and endurance improve posture and prevent injurious. It will increase the strength of the abdominal muscles, and thereby reduces the risk of the back injury for the volleyball players. The progressive Sprint Training program used in the study was based on the findings from the previous investigations as well as observations from the conditioning coaches and sports medicine professionals (Chu et al., 2006; Hewett et al., 1999; Myer et al., 2005). The components of the program include preparatory movement training and Sprint Training. Prior to the performance of the Sprint Exercises, the subjects perform one or two sets of six to ten repetitions for two or three preparatory exercises (e.g., push-up, body weight squat) which prepare them for the demands of more advanced training. The inclusion of these exercises are especially important for subjects in the study who has no experience in participating in a progressive Sprint Program. The purpose for these movements is to become 'automatic' so the skill learned could be 'tapped' so that subjects can perform more advanced Sprint Exercises. Flexibility is required for both injury prevention and to enhance the effects of the stretch shortening cycle. In fact, some advanced training methods are combined in the Sprints and Intensive Stretching in order to protect the joint and make it more receptive to the Sprint benefits (Marc De Bremaeker (2013). *Plyo-Flex*. Suthakar (2016)Sprint exercises evoke the elastic properties of the muscle fibers and connective tissue which allow the muscle to store the energy during the deceleration phase and release that energy during the acceleration period (Asmussen, 1974; Bosco, et.al., 1982; Kaneko, et.al., 1983; Stone, and O'Bryant, 1986).

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Methodology

The study was formulated as Pre and Post Test random group design, in which sixty athletes from the various colleges in Karnataka were selected as subjects and their age ranged from 18 to 22 years. The subjects were divided into three equal groups. The first group underwent Sprint Training (n=20), the second group underwent Circuit Training alone (n=20) and the third

group acted as the control group. They did not practice any specific training. The selected variables were assessed by agility (Illinois agility test) and flexibility (sit and reach test) conducted before and after the 12 weeks of training regimen.

Analysis of the data and results of the study

A paired sample of student's t-test was used to determine the significance of the mean differences between the Pretest and Posttest values of a variable in the same group. Analysis of variance (ANOVA) was used to know the significant differences among the group. Statistical significance was accepted as $p \leq 0.05$ level of confidence.

Table 1

Sprint Training Pre and Posttest Mean Values Inter Collegiate Level Athletes

Variables	Test	Mean	S.D	M.D	S.E.M	't' ratio
Agility	Pre-Test	16.8977	1.45989	1.48	0.17	8.87*
	Post Test	15.4112	1.94814			
Flexibility	Pre-Test	20.9333	2.77316	5.23	0.57	9.22*
	Post-Test	26.1667	5.35254			

0.05 level of Significance (2.09)

Table'1'shows the pre and post test mean values and standard deviation and 't'ratio of the Sprint Training. The obtained't' ratio agility (8.87) and Flexibility (9.22) are higher than the table values of 2.09. It shows a significant improvement from the pre test to post test.

Table 2

Circuit Training Pre and Post test Mean Values Inter Collegiate Level Athletes

Variables	Test	Mean	S.D	M.D	S.E.M	't' ratio
Agility	Pre-Test	16.8790	1.11146	1.54650	0.17	8.90*
	Post Test	15.3325	1.31163			
Flexibility	Pre-Test	21.0000	3.04354	6.65000	0.86	7.71*
	Post-Test	27.6500	5.44131			

0.05 level of Significance (2.09)

Table'2'shows the pre and post test mean values and standard deviation and 't'ratio of Sprint Training. The obtained t ratio agility (8.90) and Flexibility (7.71) are higher than the table values of 2.09. It shows a significant improvement from the pre test to post test.

Table 3

Control Group Pre and Post test Mean Values Inter Collegiate Level Athletes

Variables	Test	Mean	S.D	M.D	S.E.M	't' ratio
Agility	Pre-Test	17.1875	1.54469	0.13	0.072	1.78
	Post Test	17.0600	1.57727			
Flexibility	Pre-Test	20.8500	2.13431	0.20	0.092	2.01
	Post-Test	21.0500	2.11449			

0.05 level of Significance (2.09)

Table '3' shows the pre and posttest mean values and standard deviation and 't'ratio of Sprint Training. The obtained 't' ratio agility (1.78) and Flexibility (2.01) are not higher than the table values of 2.09. It does not show significant improvement from the pretest to post test.

Table 4
Analysis of variance of Pretest and posttest mean among the STG, CTG and CG of intercollegiate Athletes

ANOVA						
Variables	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
AGILITY PRE TEST	B.G	3.158	2	1.579	.734	.484
	W.G.	122.588	57	2.151		
	Total	125.745	59			
AGILITY POST TEST	B.G	103.805	2	51.903	24.630	.000
	W.G.	120.113	57	2.107		
	Total	223.919	59			
FLEXIBILITY PRE TEST	B.G	.233	2	.117	.015	.985
	W.G.	453.500	57	7.956		
	Total	453.733	59			
FLEXIBILITY POST TEST	B.G	831.633	2	415.817	27.602	.000
	W.G.	858.700	57	15.065		
	Total	1690.333	59			

0.05 level of Significance (3.16)

Table ‘4’shows the pre test, ‘F’ ratio Agility (0.73) and Flexibility (0.015) are lesser than the table value of 3.16.It shows an insignificant improvement and Table-d shows the post test ‘F’ ratio Agility (24.63), Flexibility (27.60) are higher than the table value 3.16 shows significant.

Table 5
Analysis of Covariance of adjusted Posttest Mean among the STG, CTG and CG of Inter Collegiate Athletes

Variables	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
AGILITY	Between Groups	72.718	2	36.359	76.58*	.000
	Within Groups	26.588	56	.475		
FLEXIBILITY	Between Groups	806.249	2	403.124	68.99*	.000
	Within Groups	327.207	56	5.843		

0.05 level of Significance (3.16)

The Table ‘e’ shows the adjusted post test ‘F’ ratio Agility (76.58), Flexibility (68.99) are Higher than the table value of 3.16 and significant at 0.05 level of confidence.

Table 6
The Scheffee's Post hoc test Mean Values STG, CTG and CG of Inter Collegiate Athletes on Agility.

STG	CTG	CG	M.D	C.I
14.07	15.34	-	1.27*	0.621
14.07	-	16.8	2.73*	0.621
-	15.34	16.8	1.46*	0.621

Table-'6'shows the scheffe's post hoc test mean values of STG, CTG and CG. From this comparison Sprint Training group Show better improvement than the Circuit Training Group and Control Group on Agility.

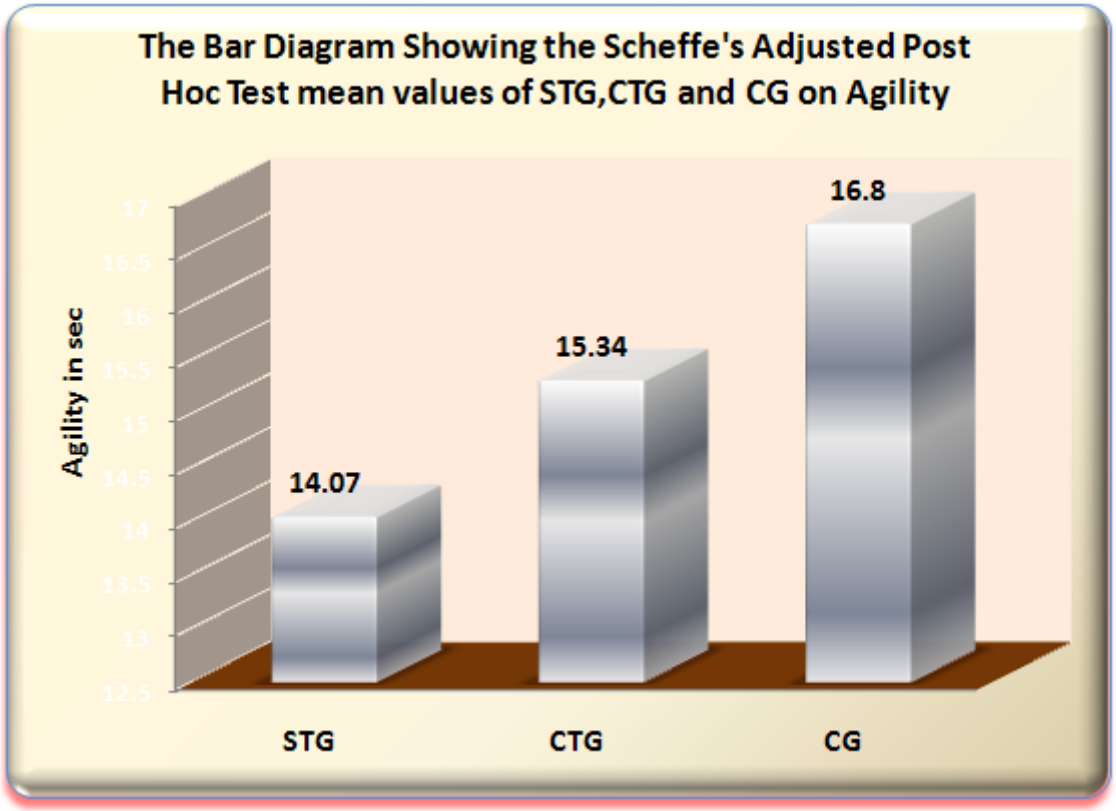
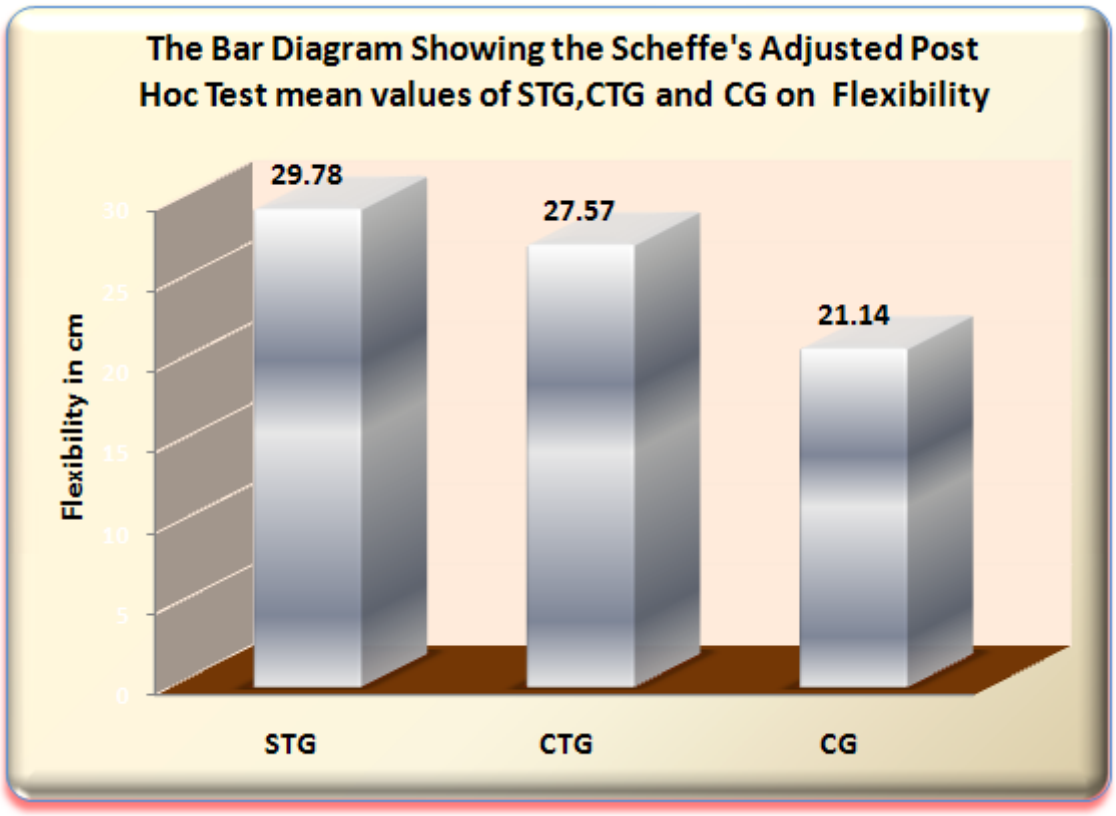


Table 7
The Scheffee's Post hoc test Mean Values STG, CTG and CG of Inter Collegiate Athletes on Flexibility.

STG	CTG	CG	M.D	C.I
29.78	27.57	-	2.21*	2.166
29.78	-	21.14	8.64*	2.166
-	27.57	21.14	6.43*	2.166

Table '7'shows the scheffee's post hoc test mean values of STG, CTG and CG. From this comparison Sprint Training group Show better improvement than the Circuit Training Group and Control Group on Flexibility.



Result

1. The result of the study showed that the Sprint Training significantly improved the Agility and Flexibility of the Inter-Collegiate level Athletes.
2. The result of the study showed that the Circuit Training significantly improved the Agility and Flexibility of the Inter-Collegiate level Athletes.
3. The result of the study showed that the Sprint Training significantly improved the Agility and Flexibility better than the Circuit Training and Control Group of the Inter-Collegiate level Athletes.
4. The result of the study showed that the Circuit Training significantly improved the Agility and Flexibility better than the Control Group of the Inter-Collegiate level Athletes.

Conclusion

1. It was concluded that the sprint training was the best training to develop the Agility and Flexibility of the Inter-Collegiate Male Athletes.
2. It was concluded that the Sprint Training significantly improved the Agility and Flexibility of the Inter-Collegiate level Athletes.
3. It was concluded that the Circuit Training significantly improved the Agility and Flexibility of the Inter-Collegiate level Athletes.
4. It was concluded that the Sprint Training significantly improved the Agility and Flexibility better than the Circuit Training and Control Group of the Inter-Collegiate level Athletes.
5. It was concluded that the Circuit Training significantly improved the Agility and Flexibility better than the Control Group of the Inter-Collegiate level Athletes.

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