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Impact of complex and contrast training On biochemical variables among sportsmen

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Abstract

The aims of this experimental analysis were to examine the effects of two different strength and power training. (Complex: CMX and Contrast: CNT training) lower body strength is assigned with repetition maximum (1RM). CMX is one of the most advanced forms of sports training; it combines with resistance training and plyometric training. It has intense strength exercise followed by a plyometric exercise (ex: Squat followed by vertical jump). CNT is the back to back combination training it includes resistance and plyometric exercises. To achieve these study 45 men physical education students were acted as subjects. This consists of three equal groups (N=15). Group 1 treated as CMX, Group 2 treated as CNT and Group 3 treated as CG. The subjects were tested on selected criterion variables viz, total protein, iron, Glucose (blood sugar) and creatinine. The duration of training was 12 weeks and the level of significance 0.05 was fixed. The Calculated data of before-test and after- test were mathematical tool by using analysis of covariance (ANCOVA). The results shows that the complex training group showed better improvement on total protein, creatinine and contrast training group showed better improvement on blood sugar and iron. It is concluded that complex training and contrast training is advantageous training for physical education students and sportsmen.

Key words: Complex Training (CMX), Contrast Training (CNT), Control group (CG), Biochemical, and Sportsmen.

Introduction

Complex training is comprises of two major training includes set of resistance exercises followed by matched plyometric exercises. Complex training is used to develop muscular strength, muscular endurance, speed and explosive power. This training activates fast twitch muscle fibers and also improving strength protocols. It has been focused on sprinters, jumpers and throwers.

Resistance exercises

- Squat
- Barbells incline bench press

Plyometric exercises

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- Vertical jump (jumps in place)
- Medicine ball chest pass

Contrast training

Contrast training refers to a form of resistance training that alternates the utilization of great and lightweight load exercises so on enhance muscular power. This training accomplishes every by requiring to perform two exercises consecutive. The first exercise could also be an ancient strength exercise, and so the second exercise is in explosive exercise that challenges an identical muscles and movement pattern. As a result of the resistance inside the initial exercise is develop, this could turn out further activation of the muscles involved inside the movement. Then, by following the first exercise with a further explosive, lighter load exercise that works identical muscles, may not entirely teach our body the simplest way to activate further muscle, but the simplest way to activate that muscle or groups of muscles further quickly resulting in improved power.

Resistance exercises and matched plyometric exercises

- Squat
- Vertical jump (jumps in place)

- Barbells incline bench press
- Medicine ball chest pass

Methodology

The aims of this experimental analysis were to examine the effects of two different strength and power training. (Complex: CMX and Contrast: CNT training) upper and lower body strength is assigned with repetition maximum (1RM). CMX is one of the most advanced forms of sports training; it combines with resistance training and plyometric training. It has intense strength exercise followed by a plyometric exercise (ex: Squat followed by vertical jump). CNT is the back to back combination training it includes resistance and plyometric exercises. To achieve these study 45 men physical education students were acted as subjects. This consists of three equal groups (N=15). Group 1 treated as CMX, Group 2 treated as CNT and Group 3 treated as CG. The subjects were tested on selected criterion variables viz, total protein (TP), iron, Glucose (blood sugar) and creatinine. The duration of training was 12 weeks and the level of significance 0.05 was fixed. The Calculated data of before-test and after- test were mathematical tool by using Analysis of Covariance (ANCOVA).

Table-I
Results of experimental groups, control group on total protein, creatinine, glucose, iron by ANCOVA

Biochemical Protocols	Test	CG	CMX	CNT	SOV	SOS	DF	Squares of mean	'F' ratio

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Glucose (Blood Sugar)	Pre test	95.0667	95.6000	95.1333	B	2.533	2	1.267	0.015
		10.36799	8.80584	7.90901	W	3466.267	42	82.530	
	Post test	95.7333	93.3333	95.8000	B	59.244	2	29.622	0.314
		10.38176	8.57460	10.38176	W	3964.667	42	94.397	
	Adjusted Post test	95.928	93.008	95.930	B	85.252	2	42.626	2.611
					W	669.436	41	16.328	
Creatinine	Pre test	0.8933	0.9120	0.8887	B:	0.005	2	0.002	0.122
		0.12228	0.12824	0.15743	W:	0.787	42	0.019	
	Post test	0.8820	1.1687	0.9480	B:	0.676	2	0.338	31.918*
		0.09352	0.08288	0.12712	W:	0.445	42	0.011	
	Adjusted Post test	0.884	1.161	0.953	B:	0.620	2	0.310	57.148*
					W:	0.223	41	0.005	
Total Protein	Pre test	7.0733	7.2000	7.0000	B:	0.307	2	0.154	0.758
		0.57998	0.31168	0.41748	W:	8.509	42	0.203	
	Post test	7.2133	6.6600	6.9293	B:	2.297	2	1.148	6.739*
		0.51805	0.22928	0.43621	W:	7.157	42	0.170	
	Adjusted Post test	7.227	6.577	6.999	B:	3.201	2	1.600	30.046*
					W:	2.184	41	0.053	
Iron	Pre test	1.3033	1.3620	1.3893	B	579.244	2	289.622	2.064
		12.38471	13.61302	9.06695	W	5892.667	42	140.302	
	Post test	1.3507	1.4060	1.4527	B	0.025	2	391.089	3.203
		11.52306	11.84302	9.65451	W	1.849	42	122.083	
	Adjusted Post test	1.389	1.398	1.423	B	88.528	2	44.264	1.217

**Significant at 0.05 level.*

Required table value at 0.05 level of significance for 2&42 degrees of freedom = 3.23 respectively.

Glucose (blood sugar) indicates that the f-ratio value is less than the required table value 3.23. This shows that there is no significance among the three groups. So the Scheffe's post hoc test is not analyzed.

Creatinine indicates from ANCOVA shown on the table the pre-test mean on Creatinine 0.122 do not reveal significant difference among the three groups on Creatinine, since the calculated f value is less than the required table value 3.23.The post test mean on Creatinine 31.918 reveals difference among the three groups on Creatinine, since the calculated value 31.918 is greater than the required value 3.23. The adjusted post test mean 57.148 is found to higher table value 3.23 therefore there exist significant among the three groups on Creatinine.

Total protein indicates from ANCOVA shown on the table the pre-test mean on total protein 0.758 do not reveal significant among the three groups on total protein, since the calculated f value is less than the required table value 3.23.The post test mean on total protein 6.739 reveals difference among the three groups on total protein, since the calculated value

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6.739 is greater than the required value 3.23. The adjusted post test mean 30.046 is found to higher table value 3.23 therefore there exist significant among the three groups on total protein.

Iron indicates that the f- ratio value is less than the required table value 3.23. This shows that there is no significance among the three groups. So the Scheffe's post hoc test is not analyzed.

Table-II

Scheffe's post hoc test on total protein, creatinine

Biochemical Protocols	Adjusted mean			Difference of mean	CI
	CG	CMX	CNT		
Creatinine	0.884	1.161	-	0.277*	0.065 (0.05)
	0.884	-	0.953	0.069*	
	-	1.161	0.953	0.208*	
Total protein	7.227	6.577	-	0.65*	0.21 (0.05)
	7.227	-	6.999	0.22*	
	-	6.577	6.999	0.44*	

The Scheffe's post-hoc test table shows for the significant differences between the paired means among control group (CG), complex training (CMX) & contrast training (CNT) groups. Since the mean difference between the paired means of the three groups is higher than the class interval (CI) value, therefore there is significant among the three groups.

Figure-1

Results of complex training, contrast training and control group on Glucose (blood sugar)

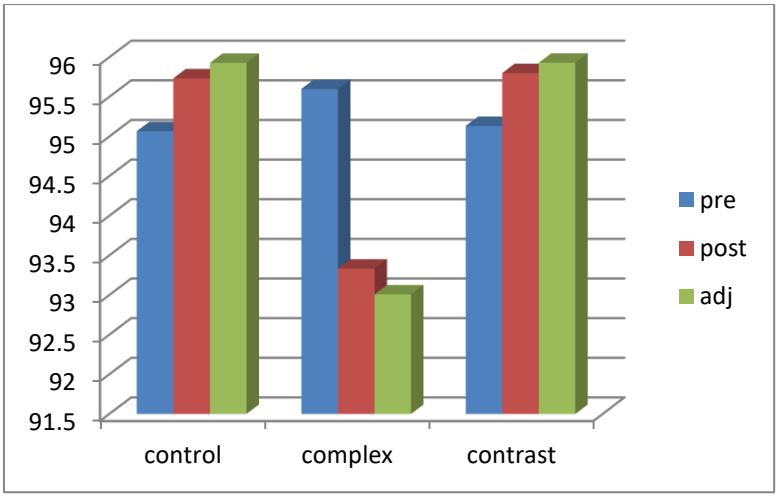

Figure-2

Results of complex training, contrast training and control group on creatinine

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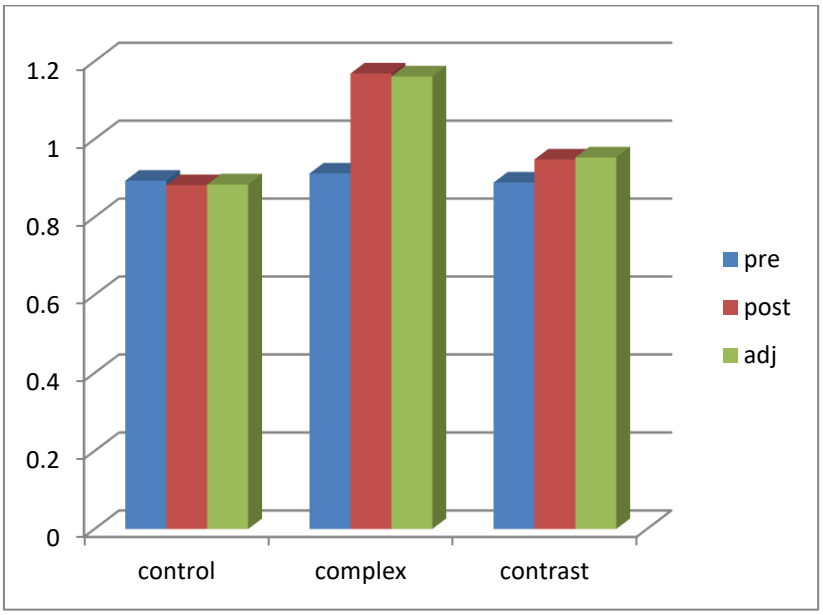

Figure-3
Results of complex training, contrast training and control group on total protein

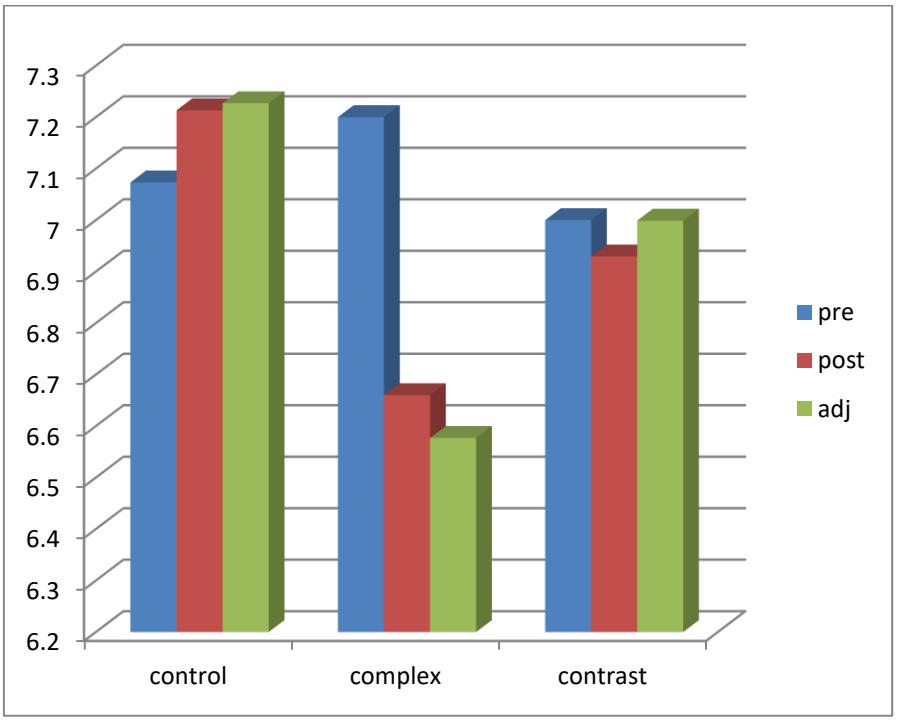

Figure-4
Results of complex training, contrast training and control group on iron

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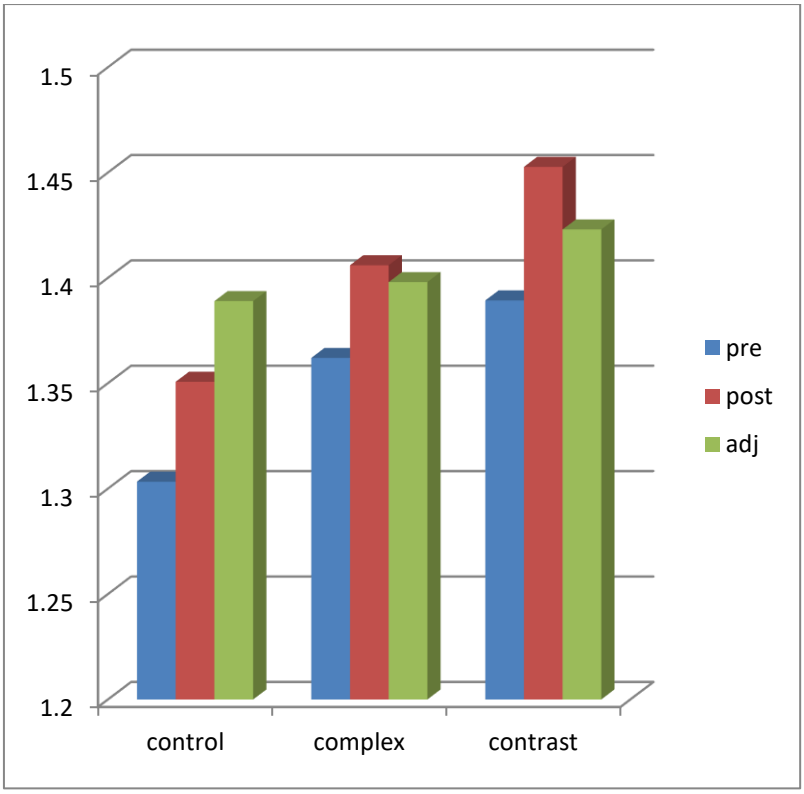

Results

The results shows that the complex training group showed better improvement on total protein, creatinine and contrast training group showed better improvement on blood sugar and iron. It is concluded that complex training and contrast training is advantageous training for physical education students and sportsmen.

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