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The Effect Of Varied Modalities Of Training On Power And VO2 Max Of Male College Cricket Players

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Abstract:
The purpose of this study was to investigate the interference effect of varied modalities training on explosive power and VO2 max of male cricket players. For this purpose 60 male cricket player were selected from Ooty, Govt. Arts college, TN, India and sedentary healthy men, with mean of age: 20.2 ±1.8 year's old, height: 168 ± 4.6 cm and weight: 63.5 ± 5.4 kg, voluntarily participated in this study. Initially, subjects were randomly assigned to one of four training groups; weight/sprint (n=15), aerobic (n=15), weight/sprint with aerobic (n=15) and control (n=15). Weight/sprint training group performed weight training followed by sprint training for 6 weeks (3days/w, 6 exercises/ 3set, 75-85% 1-RM/ 40-50 % HRR, 3 sprint 4-6 reputation, aerobic training group performed step aerobic training program for 6 weeks (3days/w, 25min :30sec:25 min for 40-50 HHR , and combined group performed combination of weight/sprint with aerobic training for 6 weeks. Control group did not participate in any of the above. All subjects performed VO2max (Bruce test) and explosive power (vertical jump test) before and after of the training program. T-test and One–way ANOVA, ANCOVA and scheffe's post hoc test was applied for examining the hypothesizes. The result of statistical analysis showed that there is significant difference on VO2 max between combination (10.6 %) versus weight/sprint (7.4 %) and aerobic (5.1 %) (p = 0.95) and on explosive power between combination (26.5 %) versus weight/sprint (19.5 %) and aerobic (9.82 %) (p = 0.31). Conclusion: combination of weight/sprint with aerobic training produced significant improvement on Vo2 max and explosive power better then the weight/sprint training, aerobic training and control group.

Key words*: combination of weight/sprint with aerobic training, weight/sprint training, aerobic training ,Vo2 max, explosive power .*

1.Introduction

Cricket is primarily a summer sport, with the season spanning October to April in Australia however at the international level, cricketers tour nearly all year round. During the Australian winter, many elite players participate in the cricket tournaments of countries in the northern hemisphere (for example, County Cricket in England or the Indian Premier League).

Professional and elite development cricketers follow a training program throughout the offseason. This includes skill based and fitness training. Weight and aerobic sessions such as running or swimming are also included several times in the training week. Short form cricket is a collective term for several modified forms of the sport of cricket, with playing times significantly shorter than more traditional forms of the game. A typical short form cricket match can be completed within two to three hours, compared to 7–8 hours for a one-day cricket match, or five days for a Test match. These short forms of cricket have been developed locally by various authorities, to fill a perceived marketing vacancy for a form of the sport which can be completed in a few hours, rather than a full day. They tend to emphasise the more "exciting" aspects of cricket as seen by more casual observers of the game, which includes aggressive batting and fast run scoring. In this regard they are successful, as shortened forms of cricket attract crowds of spectators who might not otherwise attend a cricket match. Some people decry these shortened forms of the game. Cricket is played between two teams which include players of specialised abilities comprising batsmen, bowlers, all-rounders and a wicket keeper. Games vary in duration, and number of balls bowled, and include Twenty20 fixtures, one day competition (limited overs cricket), and a game played over 4-5 days (test cricket). Cricket is not just a game of skill, but often involves playing in very challenging hot conditions for extended periods. All team members will field and may bat, however only the specialist bowlers and all-rounders may be called on to bowl.

Lockie RG, Murphy AJ, (2012 Jun) conducted a study to determine The effects of different speed training protocols on sprint acceleration kinematics and muscle strength and power in field sport athletes**.**A variety of resistance training interventions are used to improve field sport acceleration (e.g., free sprinting, weights, plyometrics, resisted sprinting). The effects these protocols have on acceleration performance and components of sprint technique have not been clearly defined in the literature. This study assessed 4 common protocols (free sprint training [FST], weight training [WT], plyometric training [PT], and resisted sprint training [RST]) for changes in acceleration kinematics, power,

and strength in field sport athletes. Thirty-five men were divided into 4 groups (FST: n = 9; WT: n = 8; PT: n = 9; RST: n = 9) matched for 10-m velocity. Training involved two 60-minute sessions per week for 6 weeks. After the interventions, paired-sample t-tests identified significant ($p \leq 0.05$) within-group changes. All the groups increased the 0- to 5-m and 0- to 10-m velocity by 9-10%. The WT and PT groups increased the 5- to 10-m velocity by approximately 10%. All the groups increased step length for all distance intervals. The FST group decreased 0- to 5-m flight time and step frequency in all intervals and increased 0- to 5-m and 0- to 10-m contact time. Power and strength adaptations were protocol specific. The FST group improved horizontal power as measured by a 5-bound test. The FST, PT, and RST groups all improved reactive strength index derived from a 40-cm drop jump, indicating enhanced muscle stretch-shortening capacity during rebound from impacts. The WT group increased absolute and relative strength measured by a 3-repetition maximum squat by approximately 15%. Step length was the major limiting sprint performance factor for the athletes in this study. Correctly administered, each training protocol can be effective in improving acceleration. To increase step length and improve acceleration, field sport athletes should develop specific horizontal and reactive power.

2.Methods Of The Study

To full fill the purpose of the study male college cricket from the Nilgiris. The investigator the proposed of research work, nature of the study and subject involved. All players and volunteered to serve as subject out of which,60 cricket players were selected at random and their age ranged 18 to 24 years. The subject was segregated into four groups, by adapting random procedure. The investigator did not make any attempt to equate the group. All the group served as experimental group. The experimental group I underwent the weight/sprint, group II aerobic training, group III combination weight/sprint and aerobic training, group IV control group. After assigning the subjects variable was conducted and the readings were recorded in their respective units. After completion of the pre-test performance on criterion variables, the subjects were treated with their respective training program for three days a week for a period of six weeks. After six weeks of training program, again the subjects were tested on the selected criterion variables and the score were recorded in its respective units as pre test. The pre-test and post-test scores were taken as data for statistical analysis. T-test and One–way ANOVA, ANCOVA and scheffe's post hoc test was applied.

3.Result And Discussion

Variables		Mean ± S.D	M.D	S.E.M	't' ratio	Sig
Power (cm)	Pre test	14.33 ±0.72	1.93	.1279	15.12	0.00
	Post test	16.27 ±0.59				
Vo2 max (ml/kg/min)	Pre test	40.45 ±1.41	2.07	2.97	21.22	0.00
	Post test	42.52 ±1.25				

Table 1: Significance of mean gains / losses between pre and post tests of weight with sprint training group on Power and Vo2 max of male cricket players
** Significant at 0.05 levels (2.14)*

Table 1 shows the obtained 't' ratios for pre and post tests mean difference in the selected variables of power (10.74), vo2 max (21.73). The obtained 't' ratios when compared with the table value of 2.14 for the degrees of freedom 1 and14. It was found to be statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre to post tests were significantly improved in performance variables of power (2.77 < 0.05), vo2 max (2.98 p<0.05).

Variables		Mean ± S.D	M.D	S.E.M	't' ratio	Sig
Power (cm)	Pre test	14.33 ±0.72	1.93	.1279	15.12	0.00
	Post test	16.27 ±0.59				
Vo2 max (ml/kg/min)	Pre test	40.45 ±1.41	2.07	2.97	21.22	0.00
	Post test	42.52 ±1.25				

Table 2: Significance of mean gains / losses between pre and post tests of aerobic training group on Power and Vo2 Max of male cricket players
** Significant at 0.05 levels (2.14)*

Table .2 shows the obtained 't' ratios for pre and post tests mean difference in the selected variables of power (15.12), vo2 max (21.22). The obtained 't' ratios when compared with the table value of 2.14 for the degrees of freedom 1 and14. It was found to be statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre to post tests were significantly improved in performance variables of power (1.93 < 0.05), vo2 max (2.07 p<0.05).

Variables		**Mean ± S.D**	**M.D**	**S.E.M**	**'t' ratio**	**Sig**
Power (cm)	Pre test	14.43 ±0.49	3.83	0.23	16.50	0.00
	Post test	18.27 ±1.10				
Vo2 max (ml/kg/min)	Pre test	40.34 ±1.37	4.29	0.43	9.83	0.00
	Post test	44.62 ±2.27				

Table 3: Significance of mean gains / losses between pre and post tests of combination of weight with sprint and aerobic training group on Power and Vo2 max of male cricket players

** Significant at 0.05 levels (2.14)*

Table .3 shows the obtained 't' ratios for pre and post tests mean difference in the selected variables of power (16.50), vo2 max (9.83). The obtained 't' ratios when compared with the table value of 2.14 for the degrees of freedom 1 and14. It was found to be statistically significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre to post tests were significantly improved in performance variables of power (3.83 < 0.05), vo2 max (4.29 p<0.05).

Variables		Mean ± S.D	M.D	S.E.M	't' ratio	Sig
Power (cm)	Pre test	14.27 ± 0.98	0.17	0.10	1.58	0.14
	Post test	14.43 ± 1.05				
Vo2 max (ml/kg/min)	Pre test	40.25 ± 1.46	2.39	2.40	0.99	0.33
	Post test	37.86 ± 9.29				

Table 4: Significance of mean gains / losses between pre and post tests of control group on Power and Vo2 Max of male cricket players

** Significant at 0.05 levels (2.14)*

Table 4 shows the obtained 't' ratios for pre and post tests mean difference in the selected variables of power (1.58), vo2 max (0.99). The obtained 't' ratios when compared with the table value of 2.14 for the degrees of freedom 1 and14. It was found to be statistically not significant at 0.05 level of confidence. It was observed that the mean gains and losses made from pre to post tests were significantly not improved in performance variables of power (0.17 < 0.05), vo2 max (2.39 p<0.05).

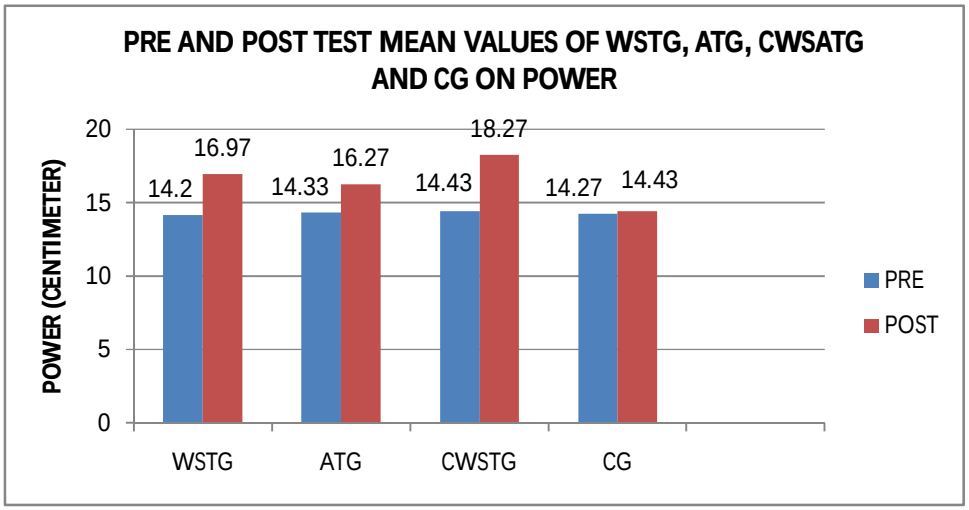

Figure 1

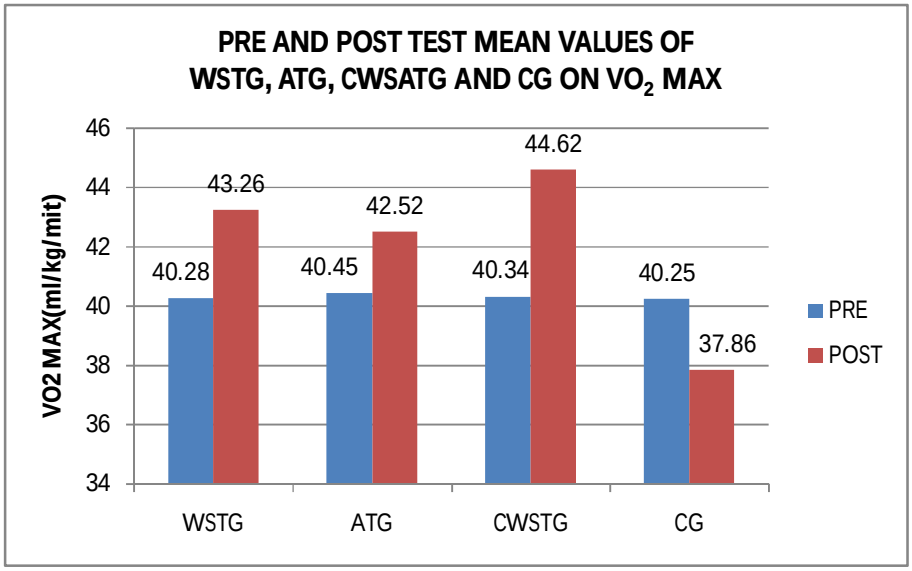

Figure 2

Test	WSTG	ATG	CWS ATG	CG	Sources	Sum of Squares	DF	Mean Square	F-ratio	Sig
Pre Test Means (cm)	14.20	14.33	14.43	14.27	B/G	0.45	3	0.15	0.27	0.85
					W/G	31.10	56	0.55		
Post Test Means (cm)	16.97	16.27	18.27	14.43	B/G	114.95	3	38.32	39.34	0.00
					W/G	54.53	56	0.97		
Adjusted Post Test Means (cm)	17.06	16.24	18.16	14.47	B/G	108.34	3	36.11	64.97	0.00
					W/G	30.57	55	.56		

Table 5: Analysis Of Variance On Pre-Post Test Means And Analysis Of Co-Variance On Post Test Means Among The Wstg, Atg, Cwsag And Cg On Power (Cm)
**Significance At 0.05 Level (2.77)*

Table -5 reveals the obtained pre test means on power. The means were 14.20 for experimental group – I, 14.33 for experimental group – II, 14.43 for experimental group – III and 14.27 for control group. The obtained 'F' ratio 0.27 was lesser than the table critical value of 2.77 for the degrees of freedom 3 and 56. Hence the pre test means were found to be insignificant at 0.05 level of confidence. The post - test means were 16.97 for experimental group – I, 16.27 for experimental group – II, 18.27 for experimental group – III and 14.43 for control group. The obtained 'F' ratio 39.34 was higher than the table critical value of 2.77 for the degrees of freedom 3 and 56. Hence the post – test means were found to be significant at 0.05 level of confidence. The adjusted post – test means were 17.06 for experimental group – I, 16.24 for experimental group – II, 18.16 for experimental group – III and 14.47 for control group. The obtained 'F' ratio 64.97 was higher than the table critical value of 2.77 for the degrees of freedom 3 and 55. Hence the adjusted post test means were found to be significant at 0.05 level of confidence. It was concluded that there was a significant mean difference existed among the weight/sprint training group, aerobic training group, combination of weight/sprint and aerobic training group and control group in developing the power of the cricket players.

WSTG	ATG	CWSATG	CG	Mean Differences	Confidence Interval
17.06	16.24	-	-	0.82*	0.77
17.06	-	18.16	-	1.1*	0.77
17.06	-	-	14.47	2.59*	0.77
-	16.24	18.16	-	1.92*	0.77
-	16.24	-	14.47	1.77*	0.77
-	-	18.16	14.47	3.69*	0.77

Table 6: The Scheffe's Post Hoc Test For The Differences Between Paired Means On Power (Cm)

** Significant At0.05 Level*

Table 4.10 shows the post hoc analysis of adjusted post test means. The mean difference required for the confidential interval value to be significant at 0.05 level was 0.77. It was observed that the combination of weight/sprint and aerobic training group significantly improved power better than the weight/sprint group, aerobic training group and control group. Weight/sprint training group significantly improved explosive power better than the aerobic training group and control group. Aerobic training training group significantly improve explosive power better than the control group.

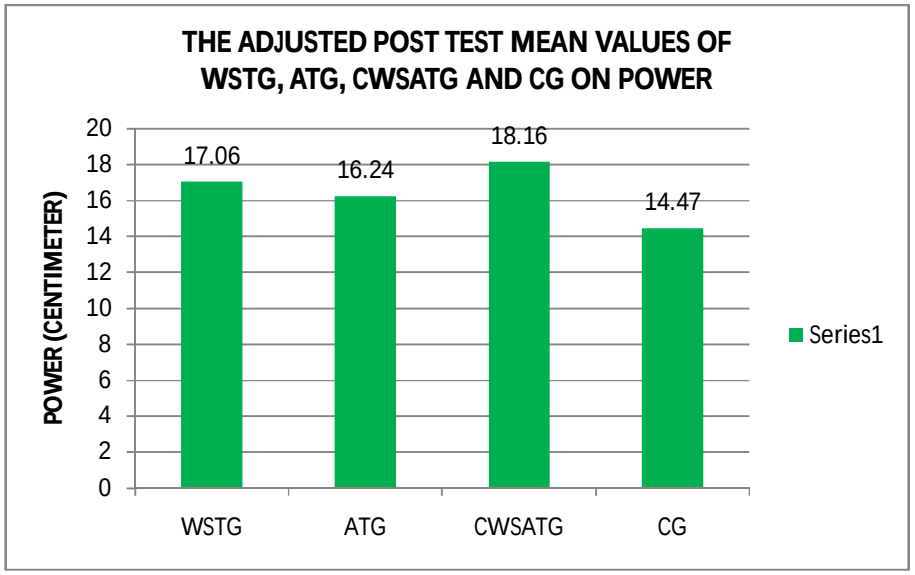

Figure 3

Test	WSTG	ATG	CWS ATG	CG	Sources	Sum of Squares	DF	Mean Square	F-ratio	Sig
Pre Test Means (ml/kg/min)	40.28	40.45	40.34	40.25	B/G	0.35	3	0.12	0.06	0.98
					W/G	112.96	56	2.02		
Post Test Means (ml/kg/min)	43.26	42.52	44.62	37.86	B/G	388.50	3	129.50	5.45	0.00
					W/G	1331.67	56	23.78		
Adjusted Post Test Means (ml/kg/min)	43.31	42.41	44.62	37.92	B/G	379.81	3	126.60	5.56	0.00
					W/G	1252.24	55	22.77		

Table 6: Analysis Of Variance On Pre-Post Test Means And Analysis Of Co-Variance On Post Test Means Among The Wstg, Atg, Cwsag And Cg On Vo2 Max (Ml/Kg/Min)
**Significance At 0.05 Level (2.77)*

Table -6 reveals the obtained pre test means on vo2max. The means were 40.28 for experimental group – I, 40.45 for experimental group – II, 40.34 for experimental group – III and 40.25 for control group. The obtained 'F' ratio 0.06 was lesser than the table critical value of 2.77 for the degrees of freedom 3 and 56. Hence the pre test means were found to be insignificant at 0.05 level of confidence. The post - test means were 43.26 for experimental group – I, 42.52 for experimental group – II, 44.62 for experimental group – III and 37.86 for control group. The obtained 'F' ratio 5.45 was higher than the table critical value of 2.77 for the degrees of freedom 3 and 56. Hence the post – test means were found to be significant at 0.05 level of confidence. The adjusted post – test means were 43.31 for experimental group – I, 42.41 for experimental group – II, 44.62 for experimental group – III and 37.92 for control group. The obtained 'F' ratio 5.56 was higher than the table critical value of 2.77 for the degrees of freedom 3 and 55. Hence the adjusted post test means were found to be significant at 0.05 level of confidence. It was concluded that there was a significant mean difference existed among the weight/sprint training group, aerobic training group, combination of weight/sprint and aerobic training group and control group in developing the vo2max of the cricket players.

WSTG	**ATG**	**CWSATG**	**CG**	**Mean Differences**	**Confidence Interval**
43.31	42.41	-	-	0.9	4.94
43.31	-	44.62	-	1.31	4.94
43.31	-	-	37.92	5.39*	4.94
-	42.41	44.62	-	2.21	4.94
-	42.41	-	37.92	4.49*	4.94
-	-	44.62	37.92	6.7*	4.94

Table 7: The Scheffe's Post Hoc Test For The Differences Between Paired Means On Vo2 Max (Ml/Kg/Min)
** Significant At0.05 Level*

Table 7 shows that the adjusted post tests mean differences on vo_2 max between weight/sprint training group and Aerobic training group , and weight/sprint training group , and combination of weight/sprint training group, and aerobic training group, aerobic training group, and combination of weight/sprint training group, and aerobic training group was 0.9, 1.31 and 2.21 respectively which was lesser than the confidence interval value of 4.94. Hence it was found to be insignificant at 0.05 level confidences. It also show that the adjusted post- test mean differences on vo_2 max between weight/sprint training group and control group, aerobic training group and control group ,combination of weight/sprint and aerobic training group and control group, were 5.39, 4.49, 6.7, respectively which was higher than the confidence interval value of 4.94 for 0.05 level of significant .Therefore the proposed null hypothesis is accepted at 5% level of significance and it was concluded that there was a significant difference between of weight/sprint training group and control group, aerobic training group and control group, combination of weight/ sprint and aerobic training group, and control group in developing the vo_2. Therefore concluded that Weight/sprint training group and aerobic training group, weight/sprint training group and combination of weight/sprint training group and aerobic training group, aerobic training group and combination of weight/sprint group and aerobic training group did not difference from each other in developing the vo_2 max.

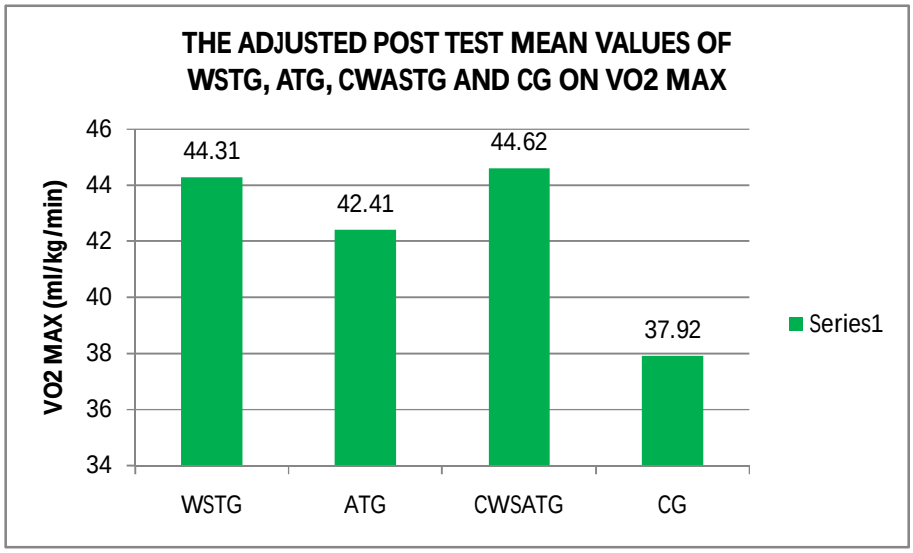

Figure 4

4.Discussion Of Finding

This study confirms that weight/sprint training group game produced improvement in selected variables on power, and Vo2vMax of male cricket players. This study also confirms that aerobics training group alone produced improvement in the selected variables on explosive power and Vo2 Max of male cricket players.

5.Explosive Power

The weight/sprint training group, aerobic training group, and combination of weight/sprint, and aerobic training group significantly improved the explosive power from pre to post test. Counter movement jump increased in the weight/sprint group pre test (14.20±70) to post test (16.97±1.11) aerobic pre test (14.33±72) to post test (16.27±59) combination of weight/sprint, aerobic training group per test (14.43±49) to post test (18.27±1.10) The explosive power significantly improved from pre test to post test in all three experimental groups. With no changes in control group.

The present study demonstrated that an increase in the explosive power of 19.50%, 9.82%, 26.54% estimate with counter movement jump weight/sprint training group, aerobic training group, and combination of weight/sprint training group, aerobic training group respectively. The combination of weight/sprint, aerobic training group improved the explosive power by 26.54% better than the weight/sprint training group 19.50% and

aerobic training group 9.82%. The weight/sprint training group improved the explosive power 19.50% better than the aerobic training group 9.82 %.

6.Vo2 Max

The weight/sprint training group, aerobic training group, and combination of weight/sprint, and aerobic training group significantly improved the vo2 max from pre to post test. Cardio respiratory endurance increased in the weight/sprint group pre test (40.28±1.44) to post test (43.26±1.42) aerobic pre test (40.45±1.41) to post test (42.52±1.25) combination of weight/sprint, aerobic training group per test (40.34±1.37) to post test (44.62±2.27) The explosive power significantly improved from pre test to post test in all three experimental groups. With no changes in control group.

The present study demonstrated that an increase in the vo2 of 7.40%, 5.11%, 10.64% estimate with vo2 max weight/sprint training group, aerobic training group, and combination of weight/sprint training group , aerobic training group respectively. The combination of weight/sprint , aerobic training group improved the cardio respiratory endurance by 10.64 % better than the weight/sprint training group 7.40 % and aerobic training group 5.11 % . The weight/sprint training group improved the 7.40 % better than the aerobic training group 5.11 % . Several studies have been conducted with moderately trained and untrained athletes.

Jeukendrup et al (2001) revealed that novice cyclist, with a relatively short history of cycling training, demonstrate a 20-38% increase in VO2 max after a 9-12 week training program. Norris & Petersen (1998) investigated the effect of an 8-week training program (5times/week, 40-55min) on the performance of 16 competitive cyclists (VO2 max 57 ml/kg/min). In that study, performance improvements were observed within four weeks, and by the end of the eight weeks of training VO2 max was improved by 5%. In the research conducted as part of this study, the combined results of the distance and sprint groups reveala 7.67% mean improvement in VO2 max after completing the four weeks of training. The gains experienced by the subjects in this training program are in keeping with those that have been found previously, though these are higher than those found by Norris & Petersen (1998)

7.Result

1. The weight/sprint training group, aerobic training group, combination of weight/sprint group and aerobic training group produced a significant improvement on explosive power, vo_2 max of male cricket players.
2. The combination of weight/sprint training group and aerobic training group improved explosive power and Vo2 max better than the weight/sprint training group, aerobic training group and control group.
3. The weight/sprint training group improved explosive power and Vo2 max better than aerobic training group and control group.
4. The aerobic training group improved explosive power and Vo2 max better than control group.

8.Conclusion

In the right of above findings of the present study, the following conclusions above been made. The combination of weight/sprint training and aerobic training group influenced the response and showed improvement in explosive power and Vo2 max of male cricket players.

9.Reference

1. Baechle, T.R & Earle, R.W. (2000). Essentials of strength Training and Conditioning, Second Edition, Illionois , Human Kinetices Books.
2. Barrow, Harold M. Rose Mary MC Gee and Kathleen A. Tritschler, (1989) Measurement in Physical Education and Sports , Philadelphia: Lea Febiger P.148.
3. Bompa, T.O. (1994). Theory and Methodology of Training , Third Edition, Iowa, Kendall, Hunt Publishing Company.
4. Cashmore. E (2004), Key Concepts in Sports Psychology, foundation books, Routledge, Taylor and Francis group, first Indian reprint p-166.
5. Ioakimidis P, Gerodimos V, Kellis E, Alexandris N, Kellis S. (2004) Combined Effects of age and maturation on maximum isometric leg press strength in young basketball players. J Sports Med Phys Fitness. 389-97.
6. Ercan GÜR,Akbar Asghari, Maryam Akbari, Serdar Orhan (2012) A study of the interference effect of concurrent training (strength and endurance) on strength and VO2max, Scholars Research Library ,Annals of Biological Research, 2012, 3 (1):214-221
7. Jones P, Lees A. (2003) A biomechanical analysis of the acute effects of complex training using lower limb exercises. J Strength Cond Res. 694-700.
8. Mark A. Hommes and Henk T. Vander Molen (2010) Effects of a Self-instruction Communication Skills Training on Skills, Self-efficacy, Motivation, and Transfer. Human Factors and Ergonomics Society. DOI: 10.1177/0018720809.