THE EFFECTS OF VARIED MODALITIES OF TRAINING ON PERFORMANCE VARIABLES OF SPEED, FLEXIBILITY AND EXPLOSIVE POWER OF MALE COLLEGIATE CRICKET PLAYERS

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Abstract: The purpose of this study was to compare the effects of the three different training modalities- weight/sprint training, aerobic training, and their combination on performance variables of speed, flexibility, and explosive power. To achieve the purpose of this study sixty male college cricket players (22.45±1.26 years and age) volunteered to participated in this study from Arts and science college ooty. 60 male college cricket players were divided into four groups a weight/ sprint training group (N=15), aerobic training group (N=15), combination of weight/sprint, and aerobic training group (N=15), and control group (N=15). Speed, flexibility, and explosive power were measured before and after 12 weeks of training period. Subjects in each of the training groups were trained for three days per week, whereas control group subjects did not practice in any activity. The data were analyzed by analysis of co-variance (ANCOVA) to determine the significant differences in the dependent variables after training. The results showed that all the treatment groups elicited significant (p<0.05) improvement in all the tested variables. However, the combination training group showed signs of improvement in the 50 meter dash, sit and reach, and vertical jump performance. That was significantly greater than the improvement in the other two training groups (weight/ sprint training, aerobic training). This study provides support for the use of combination of traditional weight/ sprint training, and aerobic training to improve the speed, flexibility, vertical jump ability, in collegiate cricket players.

Keyword: weight/sprint training, aerobic training, speed, explosive power, flexibility.

1. INTRODUCTION

Cricket is a popular team game in most Common wealth countries. In the past it was played solely in a specific season (in Asian countries it was winter and in western countries it was summer). But its popularity has gained tremendous momentum since last three decades and now it is played throughout the year. The cricketers are exposed to more demanding schedules, with longer period of time for training and practicing (Davies et al., 2008). Training and technique are very important in developing or improving the performance of cricket game like throwing, bowling, and batting ability in game of cricket. Generally as the adaptation to training takes place, the efficiency of the skill improves (Martin & Coe, 1991). In the past, players often began conditioning and training program only eight to ten weeks before the start of the match; however, it is now common to have players involved in years around new and innovative methods for conditioning in an effort to help prevent injuries enhance performance level. Numerous specialists have proposed the importance of certain fitness parameters as they relate to successful performance in cricket. This has resulted in a variety of conditioning program being designed specifically for cricket players. Many of these programs focus on the development of strength, power, flexibility, agility and cardio vascular fitness through the wide variety of activities. Weight/sprint training, aerobic dance have been used as conditioning modes for players.

While different programs have been developed, relatively few studies have examined the effect of these training programs on the important components of fitness as they relate to cricket players. The purpose of this study was to examine the effect of two training methods on selected performance variables deemed important to successful performance in cricket. Collegiate cricket players participated in a 12 week conditioning program to determine whether weight/sprint training, and aerobic dance method of training brought significantly different in their effect on cricket related parameters.
2. METHODS
2.1 Subjects
To achieve the purpose of these study sixty male college cricket players (22.45 ±1.26 years and age) volunteered to participate in this study. From Arts and Science Ooty. The nature and importance of this study was explained to the subject and they expressed their willingness to serve as subject in this study (the subject characteristics are given in table 1). All the subjects had successfully passed a physical examination and completed a medical history questionnaire in which they were screened for any possible injury or illness. The subjects received all the necessary information about the study procedures in oral form.

Table 1: Descriptive data of subject’s characteristics

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Height (cm)</th>
<th>Weight (cm)</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15</td>
<td>185.80±6.94</td>
<td>70.13±6.60</td>
<td>24.30±1.1</td>
</tr>
<tr>
<td>WSTG</td>
<td>15</td>
<td>174.49±6.36</td>
<td>68.36±7.7</td>
<td>23.70±1.5</td>
</tr>
<tr>
<td>ATG</td>
<td>15</td>
<td>178.90±4.40</td>
<td>71.59±4.4</td>
<td>21.09±1.2</td>
</tr>
<tr>
<td>CWSATG</td>
<td>15</td>
<td>173.64±5.51</td>
<td>66.99±9.9</td>
<td>20.92±0.9</td>
</tr>
</tbody>
</table>

2.2 Experimental Design
The study was formulated as pre- post test random group design, in which sixty male cricket players were divided into four groups, namely experimental group I (WSTG), experimental group II (ATG), experimental group III (CWSATG), and control group IV (CG). Each group consisted of fifteen subjects. Experimental group I (N=15) underwent weight/sprint training program, Experimental group II (N=15) underwent aerobic training program, Experimental group III (N=15) underwent combination of weight/sprint training and aerobic training, and control group IV did not undergo any specific training but they played regular cricket practice as usual. After assigning the subjects into various groups, pre- tests were conducted in the performance variables of speed, flexibility, and explosive power and the scores were recorded in their respective units. After completion of the pre test performance, the subjects were treated with their respective training programme for three days a week for a total period of twelve weeks. After twelve weeks of training programme, again the subjects were tested on the selected criterion variables and the scores were recorded in its respective units as posttest. The pre - test and post-test scores were taken as data for statistical analysis.

2.3 Measurements
Testing of subjects took place over two days. On the first day each subject reported to the laboratory, where procedures for the study were explained and informed consent was obtained. Additionally, measurements were taken of height, weight, flexibility and explosive power. On the second day 50 meters dash time was recorded.

Height and weight were measured with standard calibrated physician’s scales. Flexibility of lower back and posterior leg muscle were measured by sit and reach test. Explosive power was determined via counter movement jump test. The running speed for the 50 meter dash was determined using stop watch. Each subject was given three trails and the averaged used for analysis.

3. TRAINING PROGRAMMES
All the three groups completed one- hour conditioning workout in addition to their normal cricket practice session. The experimental group I underwent weight/sprint training regimen for a period of twelve weeks. The training regimen for weight/sprint training group consisted of three sets of four exercises, three days a week. After selecting the exercise 1 RM (Repetition maximum) was found for each subject of the experimental group for each exercise separately. 1 RM is the maximum amount of weight a person can successfully lift only one time through the full range of motion. The initial intensity was fixed at 60% and it was increased once in two weeks by 10%. The rest interval of two minutes between repetitions and five minutes between sets was given followed by sprint training.

3.1 Sprint training workout
The sprint training workout consisted of a five-minute pre- exercise stretching routine, followed by
the two 10- second sprint at 50% of the subjects maximum effort, three 10- second sprint at 100% of the subject’s maximum effort, and one 20- second sprint at 100% of the subject’s maximum effort. Subjects were given a 30 second rest period between each sprint to allow for adequate recovery.

Aerobic training workout

The aerobic dance workout consisted of a five- minute pre- exercise stretching routine, followed by 30 minutes of aerobic dance training and calisthenic activities led by a trained instructor. The aerobic dance routine included various low- and high- intensity exercises. The players exercised at an intensity of 60 to 90 (percent) of heart rate reserve. The programme was designed to work the upper and lower torso in an effort to enhance the development of the cardiovascular respiratory and musculoskeletal systems.

Combination of weight/sprint training and aerobic training

This group participated in an aerobic dance training workout for a period of six weeks. This was followed by six weeks of weight/sprint training workout. The aerobic dance training workout schedule prescribed for experimental group II and weight/ sprint training workout schedule prescribed for group I were given to this group.

4. STATISTICAL ANALYSES

The data were analyzed by analysis of Co - variance to determine the significant differences among the treatment means on each variable. When a significant difference among the training programme was detected, a pair-wise comparison of the programme was done using a Bonferroni post hoc test to identify significant differences between the training programme. The alpha level was set at 0.05 in order to consider the difference significant. The data analysis was done by using SPSS software package.

5. RESULTS

Changes in speed, flexibility and explosive power during the 12 weeks training period are presented in table I

Table – II

Mean ± SD between pre- test and posttest for all the dependent variables for the 4 groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Speed (sec)</th>
<th>Flexibility (cm)</th>
<th>Explosive power (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means ± SD</td>
<td>Means ± SD</td>
<td>Means ± SD</td>
</tr>
<tr>
<td>WSTG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>8.79±0.33</td>
<td>26.53±1.12</td>
<td>14.20±0.70</td>
</tr>
<tr>
<td>Post test</td>
<td>7.92±0.43</td>
<td>30.07±1.49</td>
<td>16.97±1.11</td>
</tr>
<tr>
<td>ATG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>8.80±0.38</td>
<td>26.47±0.99</td>
<td>14.33±0.72</td>
</tr>
<tr>
<td>Post test</td>
<td>8.20±0.41</td>
<td>29.07±1.09</td>
<td>16.27±0.59</td>
</tr>
<tr>
<td>CWSAG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>8.77±0.33</td>
<td>26.60±0.83</td>
<td>14.43±0.49</td>
</tr>
<tr>
<td>Post test</td>
<td>7.44±0.26</td>
<td>30.80±1.86</td>
<td>18.27±1.10</td>
</tr>
<tr>
<td>CG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>8.91±0.46</td>
<td>26.67±1.76</td>
<td>14.27±0.98</td>
</tr>
<tr>
<td>Post test</td>
<td>8.80±0.34</td>
<td>26.87±1.85</td>
<td>14.43±1.05</td>
</tr>
</tbody>
</table>

† Significant difference between pretest and posttest (p<0.05)
§ Significant difference compared with the control group (p<0.05)
‡ Significant difference between WSTG and CWSAG groups (p<0.05)
¶ Significant difference between ATG and CWSAG groups (p<0.05)
§£ Significant difference between WSTG and ATG groups (p<0.05)

Table I shows the mean age, weight and height for the subjects are as follows; weight/ sprint training (n=15), 24.30±1.1 years, weight 185.80±6.94 kilograms, height 174.9±6.60 centimeter; aerobic training (n=15) 23.70±1.5 years, weight 174.49±6.36 kilograms, height 68.36±7.74 centimeter; combination of weight/ sprint and aerobic training (n=15) 20.92±0.9 years, weight 173.64±5.51 kilograms, height 66.99±4.90 centimeter.

Table 2 shows the results of the performance variables of flexibility, speed and explosive

The weight/sprint training group showed a significant (P<0.05) increase in flexibility (3.35 centimeter) and explosive power (2.77 centimeter) and a significant (P<0.05) decrease in speed (0.86
The aerobic training group showed a significant (P<0.05) increase in flexibility (2.60 centimeter) and explosive power (1.93 centimeter) and a significant (P<0.05) decrease in speed (0.61 second).

The combination of weight/sprint training and aerobic dance training group showed a significant (P<0.05) increase in flexibility (4.20 centimeter) and explosive power (3.83 centimeter) and a significant (P<0.05) decrease in speed (1.32 second). There were no significant changes in pre and post training tests for any of the variables for the control group.

The analysis of Co- variance (ANCOVA) procedure demonstrated a significant value (P<0.05) for all the performance variables of flexibility, speed and explosive power and the results of the experimental groups were better than those of the control group and the Bonferroni post- hoc test was used for a pair-wise comparison of the programme (Table 2).

The combination of weight/sprint training and aerobic dance training (CWSATG) was significantly better (P<0.05) than weight/sprint training and aerobic training in increasing the flexibility and explosive power and decreasing the time for running 50 meters dash. Weight/sprint training was significantly better (P<0.05) than aerobic dance training in increasing the flexibility, explosive power and decreasing the time for running the 50 meters dash.

5.1 Discussions
The purpose of this study was to determine if weight training alone or aerobic training alone or the combination of weight/sprint training and aerobic training can enhance the performance variables of speed, flexibility, and explosive power. The results indicate that weight/sprint training alone and aerobic training alone is capable of improving the performance variables of speed, flexibility, and explosive power but its combination of weight/sprint training and aerobic training is even more beneficial.

The results of this investigation are in accordance with previous studies (asimussen 1974; cavagna 1986), (nimphius 2010) showing that a combined program of weight training and aerobic training can significantly increase the vertical jump ability Weight training alone, as has been shown by this study and other studies carried out by authors such as (noble 1979) can also have a significant effect in increasing hip and thigh that is measured by vertical jump.

This study illustrates that a combined weight/sprint training and aerobic training program significantly increases hip and thigh power production, as measured by the vertical jump, than the weight/ sprint training or aerobic training. This result is in accordance with the previous studies baur, et. al., (1990); Ioannis, et. al., (2000),(lillegard et. al., 1997). Improved muscles performance may be due to in part to increased motor unit functioning and neuromuscular adaptations such as an increased inhibition of antagonist muscles as well as better activation and co-contraction of synergistic muscles may account for the improvements in explosive power.

The discrepancy between these results might be attributed to several reasons. First the training experience level of the study subjects might offer the first explanation. Subject in the present study were novices in weight training. However, they were strength trained enough to be able to sustain speed training loads. One need to be weight trained to enjoy positive adaptations to sprint training. The second explanation is the nature of the training protocol used in the present study.

Another interesting note is that despite the fact that the subject in the combination group performed weight/sprint training, followed by sprint training on the same day, their performance was not impaired. This result is in accordance with (Ioannis, et al., 2000) who demonstrated that subject performing was not impaired in this procedure. It may be due to enough rest between sessions to allow recovery of the neuromuscular and metabolic system of the subjects.

6. CONCLUSION
The present study shows that college cricket players can be trained effectively with combination of weight/sprint training and aerobic dance training programme. While coaches have been skeptical regarding the use of weight/sprint training to improve cricket performance, the present investigation shows no negative effects. Positive results were obtained in the performance variables of flexibility, speed and explosive power. Additionally, the weight/sprint training group made significant increases in flexibility, speed and explosive power. It can be concluded that combination of weight/sprint training and aerobic dance training can significantly improve the performance variables of flexibility, speed,
explosive power.

REFERENCE


