RELATIONSHIP OF ANAEROBIC FITNESS WITH SPRINT VELOCITY AMONG SPRINTERS

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ABSTRACT

Anaerobic means without oxygen. Anaerobic exercises are activities that require quick bursts of power at high intensities. During anaerobic conditions, muscle cells must rely on other reactions that do not require oxygen. Anaerobic implies preparing without oxygen. Anaerobic activity is characterized as brief term, high force exercise enduring anyplace from only seconds up to around two minutes. The present study was conducted to examine the relationship between anaerobic fitness and sprint velocity among the sprinters. For the conduction of the study 20 female athletes and 20 male athletes has been selected from the lovely professional university Punjab between the age group of 18-25 years. For analyzing the data Pearson moment correlation method has been used to measure to relationship between anaerobic fitness and sprint velocity among sprinters. The results of the study state that there exist a negative significant co-relationship between anaerobic fitness and sprint velocity at 10 meter (-.709) among female athlete. There exist a negative insignificant relationship between anaerobic fitness and sprint velocity at 20 meter (-.114), 30 meter (-.207), 40 meter (-.132) and 50 meter (-.169) among female athlete. In case of the boys the result of the study indicates that there exit positive insignificant co- relation exist between anaerobic fitness and velocity at 10 meter (.125), 20 meter (.024), 30 meter (.120), 40 meter (.398) and 50 meter (.251) among the male sprinters. Thus it can be concluded that the relationship between the anaerobic fitness and sprint velocity among the female sprinter is partially accepted at a displacement of 10 meter and partially rejected at all the velocity of 20 meter, 30 meter, 40 meter and 50 meter. In case of boys the hypothesis stated that, “There is a positive relationship between anaerobic fitness and sprint velocity among the sprinters” is rejected.
INTRODUCTION

The physical potentials determine the success of an individual. It is said that the champions are born and not made. If the right talents in sports are selected on the basis of scientific guideline at the right age, the changes of achieving excellence in sports increase. The scientific data on champion players have given a tremendous knowledge about the physiological requirements of the different sport activities. Physical fitness refers to the limit of a competitor to meet the differed physical requests of their game without diminishing the competitor to an exhausted state. (Davis 2000). A study was undertaken by (Mazumdar 1986) to see the change in the motor fitness component playing ability resulting among football player at sides of physical education and conditioning program. He concluded that during the first stage of physical education and conditioning programme speed, maximum leg strength, ability and playing ability was improved, he also found that during second stage only maximum leg strength and agility improved, significantly, and the other thing which he said is that the break in between to the stages of training diminished the improvement playing ability, maximum leg strength and agility. The speed was unaffected and the total year’s physical education and conditioning program was proved to be of value in improving motor ability and playing ability. Speed is best defined as the ‘rate at which something happens or the rate of performance’ of an activity. It is referring to as an action of movement. The velocity at where are executed a movement may be different between failure and success. Speed is an apogee of rapid force development, reactive ability and effective movement technique. The velocity output of any movement decrease where the force demands of an active increase, as demonstrated by the force velocity come. An ability to maintain biomechanically body and limb positioning creates an increment in the velocity of movement.

The energy system is the most essential arrangement of the human body; it offers vitality to perform works even a typical action or either a game action. The anaerobic vitality system is the third sort of energy system. In this system energy produce without oxygen. Zagatto (2011) likewise decide to quantify vitality framework commitment in maximum anaerobic administration test and to check any co-relation between maximum anaerobic organization test and maximum collected oxygen deficiency. Eleven individuals from the military were enrolled for this study. Subjects performed the maximum anaerobic
administration test and maximum amassed oxygen divert, both fulfilled on a treadmill. Maximum anaerobic administration test comprised of discontinuous activity, twenty sets exertion with hundred sets of recovery, after every swell of exertion activity, vitality system commitments by maximal anaerobic running test were additionally determined by overabundance post exercise oxygen utilization, lactate reaction, and oxygen uptake estimations. Maximal gathered oxygen deficiency was controlled by five sub maximal intensities and one supra maximal force practices relating to one hundred twenty % at maximal oxygen uptake power. They inferred that the anaerobic a-lactic framework is the fundamental vitality framework in maximal anaerobic running test endeavours and this test does not essentially correspond to maximal aggregated oxygen shortfall.

Anaerobic energy is utilized without the utilization of oxygen. The anaerobic vitality system can give more amount of energy it fatigues quickly. The individuals taking an interest in sprinting, speed or power occasions are exceptionally acquainted with this type of vitality creation. By-results of the anaerobic energy system cause us to inhale quickly, our legs to blaze and our heart to pound when we mightily endeavour. In the research centre, the wingate anaerobic bike test is the anaerobic and delivered without the utilization of oxygen. The anaerobic vitality system can give awesome measure of vitality yet this framework exhausts rapidly.

Numerous qualities of the human body play real parts in the activity of sprinting. The expertise of sprinting is really reliant on a "competitor's capacity to join the activities of the legs, arms, trunk, thus on into an easily organized entire". We have to consider aspects of human anatomy, such as body height, stride frequency, stride length, speed, energy production, somatic type, anthropometry, power and muscle fibre composition, when analysing such an event. We should also consider external contributing factors such as footwear, state of fatigue, injury history, the running surface and variation in horizontal forces (Hall, 1999), if we are to truly analyze the runner within the 100-meter sprint.

It is a thirty second full scale test and there is one more test to check the anaerobic fitness that is 300 yard shuttle run test in this there are two cones set at the separation of 25 yard and competitor need to run continuously until he doesn't finish his objective. Sporis et al. (2008) demonstrated some sign that situational high-power task training was new
productive than straight-line sprint in enhancing anaerobic continuance calculated by the 300-yard transport run assessment.

**OBJECTIVE:-** The objective of the present study is to assess the relationship between anaerobic fitness and sprint velocity among the sprinters.

**HYPOTHESIS:-** The hypothesis of the study is that there exist a positive relationship between anaerobic fitness and sprint velocity among the sprinters.

**METHOD AND PROCEDURE**

The purpose of the present study was to find out the relationship of anaerobic fitness and sprint velocity among the sprinters. Hence the descriptive method of research was used for the study. In order to achieve the set objectives, it is required to choose the representative sample of the inter college level athletes. In the present study the purposive random sampling procedure was adopted by the investigator for the collection of the data. The total sample of present study comprises of 40 subjects including male (n=20) and female (n=20) who participated in the Annual athletic meet of Lovely Professional University. On the basis of available literature and in consultation with the expert of the field and considering the feasibility the selection of variables has been done i.e. anaerobic fitness and sprint velocity. 300 yard shuttle run test was conducted to check the anaerobic fitness and 10 to 50 meter dash is used for the checking the sprint velocity among sprinters. Software SPSS (Ver.22) was used to analyze the data. Pearson product moment correlation method was performed to see the whether any significant relationship exit among anaerobic fitness and sprint velocity in the sprinters.

**FINDINGS**

**Table 1: Relationship of Anaerobic Fitness with Sprint Velocity in Female Sprinters (N=20)**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Variable Co-Related with Anaerobic Capacity</th>
<th>r' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Velocity at 10 meter</td>
<td>-.709*</td>
</tr>
<tr>
<td>2</td>
<td>Velocity at 20 meter</td>
<td>-.114</td>
</tr>
<tr>
<td>3</td>
<td>Velocity at 30 meter</td>
<td>-.207</td>
</tr>
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</table>
The table 1 reveals the negative significant co-relation exist between anaerobic fitness and velocity at 10 meter (-.709) among the female sprinters. However, they show negative insignificant relationship between anaerobic fitness and velocity at 20 meter (-.114), between anaerobic fitness and velocity at 30 meter (-.207), between anaerobic fitness and velocity at 40 meter (-.132) and between anaerobic fitness and velocity at 50 meter (-.169) among female sprinter. Hence, the hypothesis is stated as, “There is a positive relationship between anaerobic fitness and sprint velocity among the sprinters” is partially accepted at a displacement of 10 m and partially rejected in all the velocities at displacement of 20 m, 30m, 40m and 50 m.

Table 2: Relationship of Anaerobic Fitness with Sprint Velocity in Male Sprinters (N=20)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Variable Co-Related with Anaerobic Capacity</th>
<th>r' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Velocity at 10 meter</td>
<td>.125</td>
</tr>
<tr>
<td>2</td>
<td>Velocity at 20 meter</td>
<td>.024</td>
</tr>
<tr>
<td>3</td>
<td>Velocity at 30 meter</td>
<td>.120</td>
</tr>
<tr>
<td>4</td>
<td>Velocity at 40 meter</td>
<td>.398</td>
</tr>
<tr>
<td>5</td>
<td>Velocity at 50 meter</td>
<td>.251</td>
</tr>
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</table>

*Significant at .05 level (r=.444)

The table 2 reveals the positive insignificant co-relation exist between anaerobic fitness and velocity at 10 meter (.125), velocity at 20 meter (.024), between anaerobic fitness and velocity at 30 meter (.120), between anaerobic fitness and velocity at 40 meter (.398), between anaerobic fitness and velocity at 50 meter (.251) among the male sprinters. Hence, the hypothesis is stated as, “There is a positive relationship between anaerobic fitness and sprint velocity among the sprinters” is rejected.
DISCUSSION

The focus of the present study was on the relationship of anaerobic Fitness and muscle strength with sprint velocity among the sprinters. From the analysis of the result, it is clear from table no. 1, that co-efficient of correlation of anaerobic fitness with velocity at 10m was negative and significant. However, they show negative insignificant relationship between anaerobic fitness and velocity at 20 meter, velocity at 30 meter, velocity at 40 meter and velocity at 50 meter among the female sprinters. It shows that anaerobic fitness has negatively effects the sprint velocity in female. But in case of male sprinters as it is clear from table 2, that co-efficient of correlation of anaerobic fitness with velocity at 10 meter, velocity at 20 meter, velocity at 30 meter, velocity at 40 meter and velocity at 50 meter were positive and insignificant. Finding indicates that in male the anaerobic fitness has positively affects the sprint performance. Rimmer and Sleivert (2000) conducted a study and compared the effect of sprint specific polymetric training against traditional sprint training on 10 meter and 40 meter times. The plyometric group showed significant decrease in both 10-meter and 40-meter times. However, these improvements weren’t significantly differing from the sprint group. In their conclusion, the author state that sprint-specific plyometric can improve 40 meter sprint by the same extent as the traditional sprint training possibly through decreasing ground contact times. But at the same time Rimmer and Sleivert’s findings also supported an earlier study that showed plyometric- induced performance improvements were greater over the initial acceleration phase of the first 10 meters (Delecluse, et al. 1995). In this study, it is found that the plyometric training group gained significant improvements in their 10 meter sprint times when compared to high resistance, sprint and passive control groups. The plyometrics group also improved significantly in their 100 meter sprint times when compared to the sprint and passive groups.

CONCLUSIONS

1. There exist a negative significant relationship between anaerobic fitness and sprint velocity at 10 m among the female sprinters. However, anaerobic fitness has shown negative insignificant relationship with velocity at 20 meter, velocity at 30 meter, velocity at 40 meter and velocity at 50 meter among the female sprinters.
2. There exist a positive significant relationship between anaerobic fitness and sprint velocity at 10 m, velocity at 20 meter, velocity at 30 meter, velocity at 40 meter and velocity at 50 meter among the male sprinters.

REFERENCES


