Comparative Study of Anaerobic and Aerobic Capacity between Hockey and Football Male Players of Haryana

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Abstract

The purpose of the study was to compare the anaerobic and aerobic capacity between hockey and football male players of Haryana. The study was conducted on 50 players (N=50) 25 hockey and 25 football male players from Rohtak and Bhiwani District of Haryana. For the study, anaerobic capacity was measured by 50-meter dash and the score was that time elapsed in the nearest 1/10th of a second. The aerobic capacity was measured by 9-minute run and walk test scoring will be in meters and nearest to 25 meters. The ‘T’ test was used for statistical analysis of data and level of significance was set at 0.05 levels.

Introduction

Aerobic capacity is the ability to mobilize energy for continuous performance of specific movement for prolonged time, i.e. the capacity for prolonged physiological functioning under continuous supply of required oxygen under conditions of required oxygen completely available. The glucose molecule is completely broken down to CO2 and H2O, and energy is made available as needed. Anaerobic capacity is the ability to mobilize energy during activities of intensive nature, i.e. executing intensive work with explosive action in short duration of time, such as, kicking the football faster and for explosive take off in jumps, the maximum rate for about two to three minutes under water swimming.

The physiological systems of the body interact to accomplish a variety of tasks. There interdependence can be linked to a symphony orchestra whose different musical instrument represents various organ systems and whose conductor represents the higher Brain center. The capacity for prolonged physiological functioning demanding cardiovascular endurance depends upon Aerobic capacity, i.e. energy metabolism under continuous supply of oxygen to the organism. Intensive burst of activities, i.e. executing high load of work with explosive action and of short duration of time, such As kicking the football faster and far, explosive take off in jumps, throwing an implement etc. depend upon anaerobic capacity, i.e. efficiency in energy production in the absence of oxygen supply, though the oxygen would be taken up later during the recovery period after the cessation of activity. Both Aerobic and Anaerobic capacities play an important role in influencing the performance in various games and sports. In activities which involve working with maximal intensity for a shorter period of time, such as, Sprinting, Weight lifting, kicking of Football fast, explosive jumping, etc. Where anaerobic capacity plays an important role in games and sports where a sportsman has to resist fatigue relatively for longer period without affecting skill proficiency, for example, long distance running, swimming, cycling, rowing and even some team sports such as football and hockey.

The games, football and hockey are the most popular sports in the world in terms of spectator sports. It is fast, quick and aggressive. They are considered as strenuous games because the games demand a high degree of fitness as well as intelligence and alertness of mind, speed, agility, jumping ability which are the basic qualities of the players.

Purpose of the study

Comparative study of anaerobic and aerobic capacity between hockey and football male players of Haryana.

Objective of the study

✓ To compare the anaerobic capacity between hockey and football male players of Haryana.
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Hypothesis of the study

For the study null hypothesis was framed for the study.

Methodology

Sample of the study

A total number of 50 (25 hockey) and 25 (football) male players were selected for the study. The age of the subject ranged from 15-19 years.

Selected Variables

The selected variables were anaerobic capacity and aerobic capacity.

Tool Used

- Anaerobic capacity was measured by 50-meter dash. The score was that time elapsed in the nearest 1/10th of a second.
- Aerobic capacity was measured by 9-minute run and walk test. The scoring will be in meters and nearest to 25 meters.

Statistical Technique used

To compare the difference between football and hockey male players’ t test was calculated. The mean and standard deviations were calculated and significance level was fixed at 0.05 levels. These statistical calculations were calculated using SPSS version 16.

Result and Discussion

The analysis of data on selected variables those were anaerobic fitness and aerobic fitness collected on twenty-five (25) hockey male players and twenty-five (25) football male players of Haryana

<table>
<thead>
<tr>
<th>Game</th>
<th>Anaerobic fitness</th>
<th>Aerobic fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D</td>
</tr>
<tr>
<td>Hockey male players</td>
<td>8.21</td>
<td>.39</td>
</tr>
<tr>
<td>Football male players</td>
<td>7.86</td>
<td>.50</td>
</tr>
</tbody>
</table>

NS=Not Significant at 0.05 level

Graph-1

Graphical representation of anaerobic and aerobic capacity between hockey and football male players of Haryana.
Table 2
Mean Scores, standard deviation, df and t-ratio of anaerobic capacity between hockey and football male players of Haryana

<table>
<thead>
<tr>
<th>Variables</th>
<th>Game</th>
<th>Number</th>
<th>Mean</th>
<th>S.D</th>
<th>D.F</th>
<th>‘t’ ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaerobic</td>
<td>Hockey</td>
<td>25</td>
<td>8.21</td>
<td>.39</td>
<td>23</td>
<td>2.38</td>
</tr>
<tr>
<td>capacity</td>
<td>Football</td>
<td>25</td>
<td>7.86</td>
<td>.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS= Not Significant at 0.05 level

The mean values of football and hockey male players on anaerobic capacity were 8.21 and 7.86 respectively. S.D were .39 and .50 respectively. The obtained ‘t’ value was 2.38 significance of 0.05 level of confidence with DF 23. The results of study showed that there was no significant difference that exists between football and hockey male players on anaerobic capacity.

Graph-2
Graphical representation of anaerobic capacity between hockey and football male players of Haryana

Table 3
Mean Scores, standard deviation and t-ratio of aerobic capacity between hockey and football male players of Haryana

<table>
<thead>
<tr>
<th>Variables</th>
<th>Game</th>
<th>Number</th>
<th>Mean</th>
<th>S.D</th>
<th>D.F</th>
<th>‘t’ ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaerobic</td>
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<td>.41</td>
<td>23</td>
<td>2.92</td>
</tr>
<tr>
<td>capacity</td>
<td>Football</td>
<td>25</td>
<td>2.27</td>
<td>.39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS= Not Significant at 0.05 level

The mean values of football and hockey players on aerobic capacity were 2.52 and 2.27 respectively. S.D were.41 and.39 respectively. The obtained ‘t’ value was 2.92 for significance at.05 level of confidence with DF 23. The results of study showed that there was no significant difference that exists between football and hockey male players on aerobic capacity.
Graphical representation of aerobic capacity between hockey and football male players of Haryana

Discussion on finding
The findings of the study showed that there was no significant difference between football and hockey male players in anaerobic power and aerobic capacity. The game of field hockey and football involves walking, jogging, sprinting in varied directions with and without the ball. In both games, lots of movements and skills are involved so, a high level of physical demand is required for match play. As the players have to cover a large area during attack and defense, the game demands aerobic as well as anaerobic fitness. A high number of accelerations and decelerations, associated with the large number of changes in direction of play create an additional load to the muscles involved in field hockey; those players better suited to cope with the demands of the game reach the elite level. The intermittent high intensity pattern of activity during the match requires a high function of both the aerobic and anaerobic energy delivery pathways (Montgomery, 2006; Quinney et al. 2008; Tarter et al. 2009; Bloomfield et al. 2007; Elferink-Gemser et al. 2006; Tarter et al. 2009). These are the reason for not having difference between football and hockey players on aerobic and anaerobic power.

Conclusion
In this study it was concluded that there was no significant difference between football and hockey male players in aerobic and anaerobic power. This may due to the fact that, basically football and hockey players having the same qualities aerobic and anaerobic performance. So, the difference may not be achieved between each of them.

References