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CHANGES OBSERVED ON SPEED AND AGILITY OF MALE HANDBALL PLAYERS DURING A HANDBALL MATCH

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Abstract: The study was proposed to investigate the changes observed on speed and agility of male handball players during a handball match and it also intend to assess the difference among different playing position. We selected twelve (12) university represented male handball players from Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu. The selected subjects were classified into three groups with respect to playing position (back court players – 6, wing players – 4 and pivot players – 2). However, in the present study goalkeepers were excluded from the study. The result of the study showed that speed and agility showed no significant difference between first and second half ($p > 0.05$) during a handball match. However, the ANOVA showed significant difference on speed and agility on first and second half. The Scheffé S post hoc test showed that a significant difference noted between back – pivot ($p = 0.006$) and wing – pivot ($p = 0.010$) on speed. Similarly, on agility back – pivot ($p = 0.012$) and wing – pivot ($p = 0.029$) but other comparisons displayed no significant difference. It is concluded that 60 minutes of handball match displayed no changes in speed and agility. However, the position wise comparison showed pivot players slow and less agile than other players.

Keywords: speed, agility, handball match, 30 yard dash, t – test, back, wing and pivot

Introduction

Handball is a fast body contact Olympic team sport that requires running, jumping, sprinting, throwing, repeated sprinting, faking, hitting, blocking and pushing. Handball requires a high standard of preparation in order to complete sixty minutes of competitive play and to achieve success. At present the requirements for the players have changed as the game of handball has developed over the years. The amount of training and the number of matches have increased considerably and the recently introduced rule on quick throw-off and the tightening-up of the rule concerning passive playing have led to an increased number of attacks and intensity for players [1]. This has contributed to increase the dynamics and physical demands imposed on the players. With this development in mind, there is a need to examine, plan and implement optimal physical training regimes for handball players.

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The ability to perform and to produce top performance for prolonged periods plays a key role in competitive handball match. As a consequence, training and testing strategies have been proposed to monitor and enhance players' ability to perform high during the match [2]. The aim of the study was to investigate the changes observed on speed and agility of male handball players during a handball match and it also intend to assess the difference among different playing position.

Methods

Subjects

We selected twelve (12) university represented male handball players from Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu. The selected handball player's age were 22.12 ± 3.22 years; height 174.50 ± 7.83 cm and weight 65.62 ± 7.79 kg. The selected subjects were classified into three groups with respect to playing position (back court players – 6, wing players – 4 and pivot players – 2). However, in the present study goalkeepers were excluded from the study and number of players based on position was considered as limitation of the study.

Variables and test

30 metres dash

The purpose of the test was to determine the player's maximum sprint speed and the ability to accelerate from a stationary position. The test involved running a single maximum sprint over 30 metres, with the time recorded. The start was from a stationary standing position, with one foot in front of the other. The front foot must be on or behind the starting line. This starting position should be held for two seconds prior to starting, and no rocking movements were allowed. The tester provided hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and encouraged to continue running hard through the finish line. The time elapsed was recorded manually by stop watch and provided with one trial.

T-test

The T-Test is a test of agility for players, and includes forward, lateral, and backward running. Four cones were set out (5 yards = 4.57 m, 10 yards = 9.14 m). The subject stood at cone A to start. On the command of the timer, the stop watch was started, the subject sprinted to cone B and touched the base of the cone with their right hand. They then turned left and shuffled sideways to cone C, and touched its base, this time with their left hand. Then they shuffled sideways to the right to cone D and touched the base with the right hand. Then they shuffled back to cone B touching with the left hand, and ran backwards to cone A. The stopwatch was stopped as they passed cone A. The time elapsed was recorded manually by stop watch and provided with one trial.

Collection of data

The data will be collected during 60minutes handball match. The players will provide data at the end of first half and second half of the match. The regular 10 minutes break was

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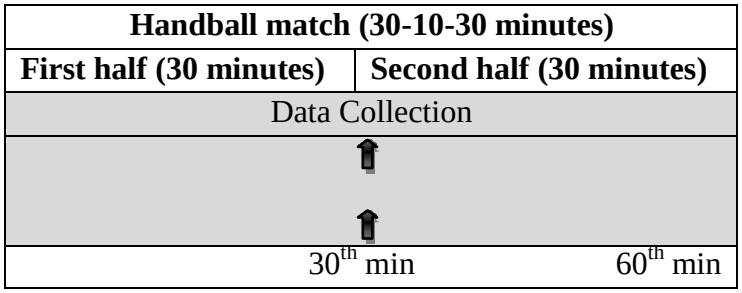
granted excluding 2 minutes of data collection between first and second half of the match. The Graphical representation of data collection was presented in figure 1.

Figure 1
Graphical Presentation of data collection during a handball match



Statistical technique

All statistical analyses were conducted using SPSS Version 16. All data are expressed as group mean values ± standard deviations (SD) unless otherwise stated. The paired Student t test was applied to know the difference between the first and second half of the match and one way ANOVA was applied to know the difference between the groups with respect to playing position was assessed. The Scheffé S post hoc test was applied to know the difference between the groups with respect to playing position. The level of statistical significance was set at $p \leq 0.05$ using a 2-tailed test design.

Results

Speed

The difference between first and second half on speed was found to be not significant as the obtained t = 0.625 ($p > 0.05$). However, one way ANOVA revealed no significant difference on first half (F = 1.570, $p = 0.260$) and significant difference on second half (F = 10.431, $p = 0.005$). The Scheffé S post hoc test showed that a significant difference noted between back – pivot ($p = 0.006$) and wing – pivot ($p = 0.010$), but other comparisons displayed no significant difference. The mean and standard deviation on speed of handball players at first and second half of the match is displayed in figure 2 and position wise in figure 3.

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Figure 2: Mean and standard deviation on speed at first and second half

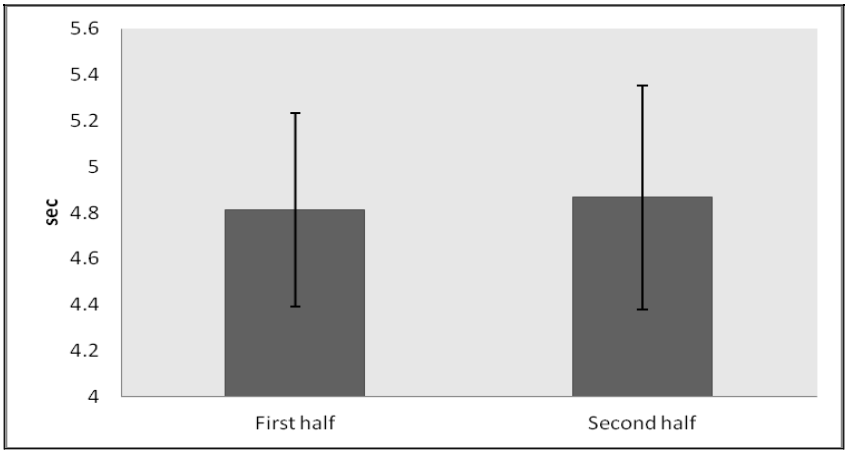
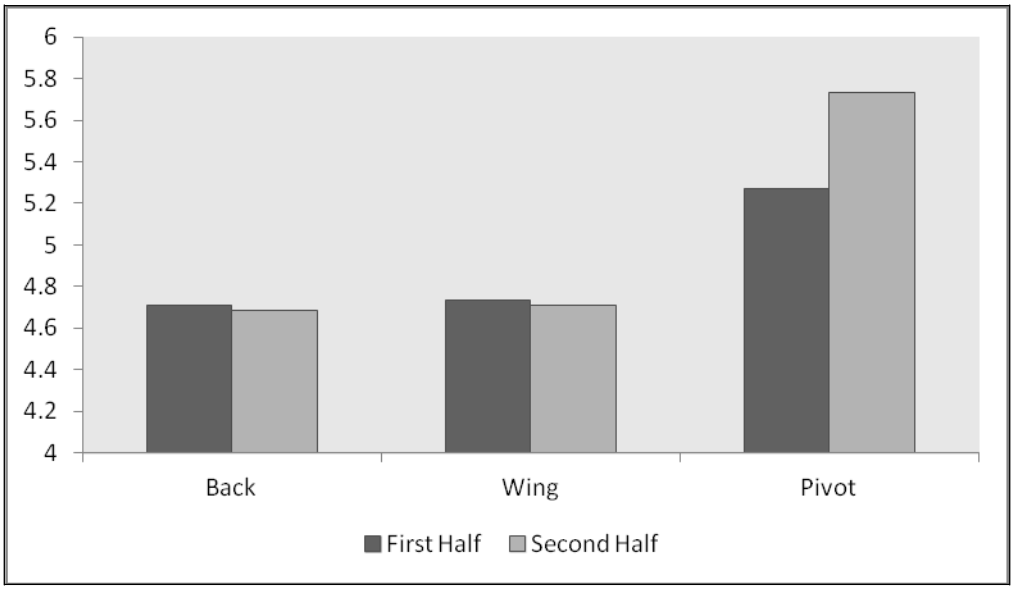


Figure 3: Mean and standard deviation on speed with respect to playing position on each half



Agility

The difference between first and second half on agility was found to be not significant as the obtained t = 0.184 (p > 0.05). However, one way ANOVA revealed a significant difference on first half (F = 7.851, p = 0.011) and second half (F = 8.272, p = 0.009). The Scheffé S post hoc test showed that a significant difference noted between back – pivot (p = 0.012) and wing – pivot (p = 0.029), but other comparisons displayed no significant difference. The mean and standard deviation on speed of handball players at first and second half of the match is displayed in figure 4 and position wise in figure 5.

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Figure 4: Mean and standard deviation on agility at first and second half

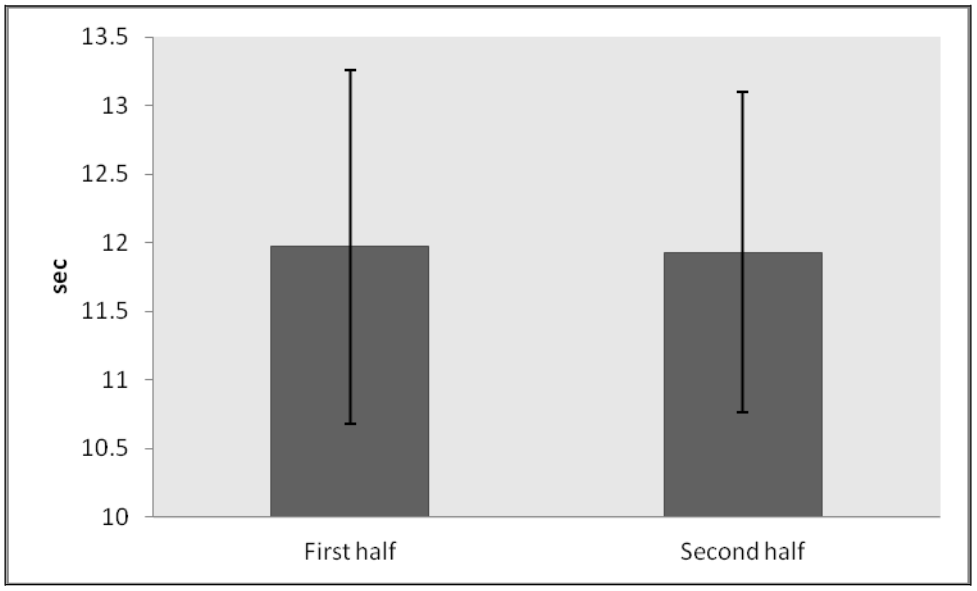
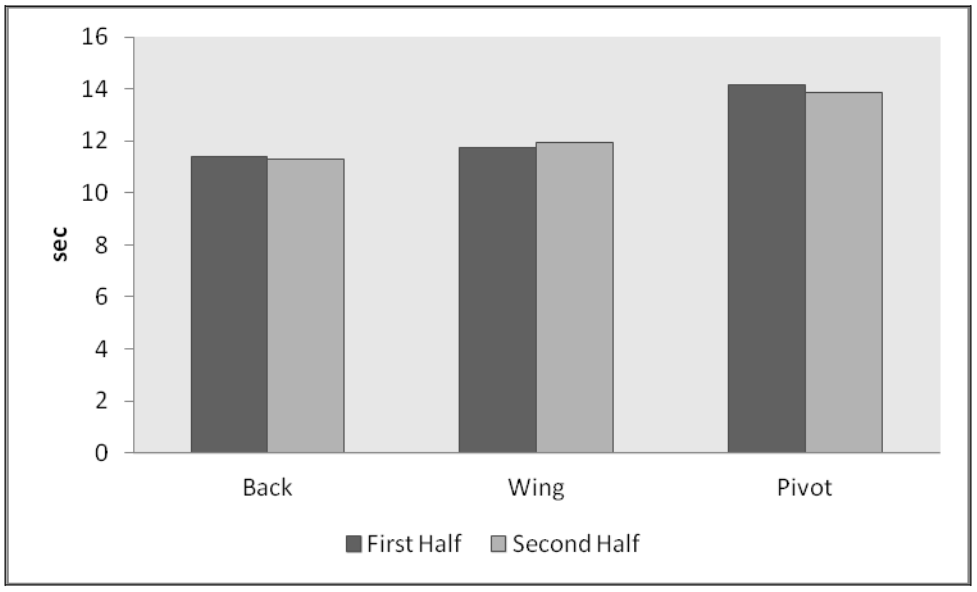


Figure 5: Mean and standard deviation on agility with respect to playing position on each half



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Discussion

In the present study which revealed no significant difference between first and second half a handball match on speed and agility. Several studies showed a significant relationship between speed and agility in handball players [3]. Chittibabu (2014) [4] earlier identified that back court players require greater amount of speed and endurance to have better jump shoot accuracy in women handball players. This shows that playing ability has significant relationship with fitness parameters. Granados *et al*. (2008) [5] and Jensen *et al*. (1997) [6] stressed that more time should be dedicated to sprint training and leg muscle strength and power training, in order to increase sprint performance.

During a handball match the players has to sprint for fast break, defence and offence and similarly they perform feints, change of directions. During handball match the players experience fatigue as result speed and agility showed remained unaltered. The present study showed slightly slower in second half of the match but statistically no difference is elicited. Print and agility is frequently associated with successful performance in handball. However, during competition, the athlete rarely covers the necessary distance to achieve top speed. Accordingly, the ability to accelerate, defined as the rate of change in velocity, is more important to successful performance than maximum velocity [7]. Dividing horizontal movements into eight different acceleration categories revealed a high mean number of distinct accelerations per minute for the players of the two teams. With about 200 separate accelerations per minute, nearly three accelerations occurred per second. This finding suggests that team handball players perform and changes from one type of action to another very frequent, and hence agility and speed are extraordinary important.

Rogulj *et al*. (2005) [8] showed that wing players were faster and more agile than pivots and goal keepers. However, they reported no significant differences between wing players and back-court players in agility and speed. Speed was assessed using a 30-m run, and agility was assessed using tests such as the stepping aside test. Team handball wing players are usually required to be faster and more agile than other field players.

Implication

This study provides the first detailed analysis of speed and agility during a handball match on male handball players. Altogether, our results showed that pivot players are slow and less agile than other players. Furthermore, back and wing players are characterized by remarkable differences in their acceleration and sprinting profiles as compared to pivot. This would mean that training programs should address the development of position-specific movement characteristics.

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