

Full Length Research Article

Estimation of Relationship Between Sprinting Performance with Agility and Explosive Power of Male Handball Players

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The aim of the study was to investigate the relationship between sprinting performance with agility and explosive power of male university handball players. Twenty seven (27) male university handball players were selected from Department of Physical Education and Sports Sciences, Annamalai University, who voluntarily participated in this study. Sprinting performance was measured by 30 meter dash, agility through T - test and explosive power through vertical jump test was selected. The result of the present study showed that product moment correlation analysis showed significant correlation between sprinting performance with agility ($r = 0.580, p = 0.002$) and explosive power ($r = -0.491, p = 0.009$). The findings of the present study indicated significant positive correlation of sprinting performance with agility and negative correlation with explosive power among male handball players. This clearly shows that players with good 30 meters sprinting performance will have better agility and explosive power.

Key words: Handball, T test, 30 meters dash, vertical jump

INTRODUCTION

Handball is a fast body contact game played around the world. Since its inception from 1936 Berlin Olympics this game had undergone several modifications in the rules and game pattern. The modification of rules like fast throw off, goalkeeper throw, timeouts during last five minutes, etcetera have clearly showed that fitness of players plays a vital role during competition. Today handball players require a high level of general and specific fitness. The actual length of a match is about 60 minutes, with consecutive attacks and defences, performed with high intensity. During a game, direct contact with opponents takes place, and players perform a lot of accelerations, turns and jumps. Speed and agility are some of the most significant, and visible, components for handball success. An important ability to react quickly, apply significant force rapidly in the appropriate direction and to redirect that force. Speed and agility involved learned motor skills. Although running speed is generally correlated with athleticism, the ability to adapt and redirect speed appropriately to the needs of the game is an essential skill for athletic success, especially in team games. Castello and Kreis (1993) observed a direct correlation between increased agility and development of athletic timing rhythm and movement. The speed and agility are key components for handball players. Although the magnitude of proficiency will vary with each individual, learning the efficient and effective execution of these skills can improve overall handball performance. Chittibabu (2014) assessed the position wise comparison of speed and agility among university level handball players and found that wing players found to be better in speed and agility.

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This difference would significantly influence the game. So assessment of the physical capacities of athletes is one of the most important issues in modern sports, many test used in order that selection procedures, for screening candidates, or to monitor the efficacy of training regimes (Norkowski, 2002). Despite sports performance professionals and sports scientists focus on performance assessment, there is lack of research examining the relationships between various motor skills (Vescovi and McGuigan, 2008). Therefore, The aim of the study was to investigate the relationship between sprinting performance with agility and explosive power of male university handball players.

METHODS

Subjects

Twenty seven (27) male university handball players were selected from Department of Physical Education and Sports Sciences, Annamalai University, who voluntarily participated in this study. Their mean (SD) for age, height, weight, percent body fat, lean body mass and fat mass were: 21.62 ± 1.90 years; 172.07 ± 7.25 cm; 64.59 ± 9.92 kg; $6.33 \pm 3.56\%$; 59.93 ± 8.20 kg; 4.65 ± 3.48 kg respectively. These selected players represented Annamalai University in Indian university competition from 2 to 8 years. All subjects were informed of the risks and benefits of the study and gave written consent.

Variables and tests

Sprinting performance, agility and explosive power was selected as criterion variables. To measure sprinting performance 30 meters dash for agility T - test and explosive power through vertical jump test was administered. All timing

was recorded manually using a stop watch by establishing both testers and equipment reliability.

Statistical technique

The Statistical Package for Social Sciences (*SPSS 16 for Windows*) was used for all statistical analyses. The Pearson product moment correlation coefficient (*r*) was used to determine the relationship between maximal oxygen consumption and body composition. The level of significance was set at $p < 0.05$.

RESULTS

The result of the present study showed that product moment correlation analysis showed significant correlation between sprinting performance with agility ($r = 0.580, p = 0.002$) and explosive power ($r = -0.491, p = 0.009$) (Table 1). However, agility showed a significant relationship with explosive power ($r = -0.551, p = 0.003$). The mean sprinting performance (4.54 ± 0.36); agility (10.62 ± 0.59) and explosive power (47.22 ± 7.47).

Table 1. The relationship between sprinting performances with agility and explosive power

Variables	Sprinting performance	Agility	Explosive power
Sprinting performance	-	0.580 (0.002)	-0.491 (0.009)
Agility	0.580 (0.002)	-	-0.551 (0.003)
Explosive power	-0.491 (0.009)	0.348 (0.075)	-

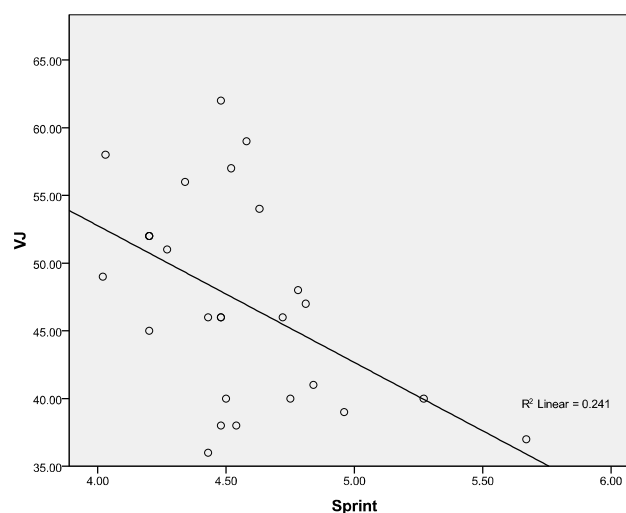
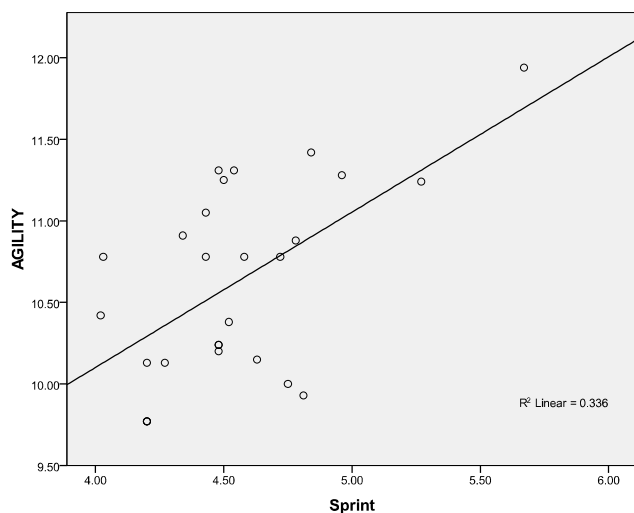


Figure 1. Correlation of sprinting performance with agility and explosive power of handball players

The findings of the present study indicated significant positive correlation of sprinting performance with agility and negative correlation with explosive power of male handball players (Figure 1). This clearly shows that players with good 30 meters sprinting performance will have better agility and explosive power.

DISCUSSION

The present study results indicate that sprinting for thirty meters show significant correlation with agility and explosive

power in handball players. Straight line sprint is entirely different from change of direction speed. The relationship between linear sprinting and agility performance have been examined by few studies (Little and Williams, 2005; Paoule *et al.*, 2000; Vescovi and McGuigan, 2008). Moderate correlation was reported between T-test performance and 37 m sprint times in a group of college-aged women by Paoule *et al.* (2000). In contrast, Little and Williams (2005) found a weak correlation between acceleration (10 m) and maximum speed in a zigzag agility test in a group of professional male soccer players. The association between agility and speed increases with longer distances and when examining agility with flying sprint times (Vescovi and McGuigan, 2008). The reason of differences between studies could be the use of different agility tests (Vescovi and McGuigan, 2008). The ability of the handball players to change their direction without reducing the speed gets adapted due to training and the nature of the game were they perform higher acceleration, as well as deceleration and change of direction, so that can be one of the reasons for the correlation.

In contrast, explosive power showed negative correlation with sprinting performance. Handball is a game which requires greater explosive power to perform sprint and jump shot during the game. Cronin and Hansen (2005) reported weak negative associations between countermovement and squat jump performance and 5, 10, and 30 m sprint times. This clearly show that sprinting performance display a prominent relationship with agility and explosive power. Coaches should be aware of the relationship while prescribing training for handball players.

Conclusion

The findings of the present study indicated significant positive correlation of sprinting performance with agility and negative correlation with explosive power of male handball players. This clearly shows that handball players with good 30 meters sprinting performance will have better agility and explosive power.

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