



EFFECT OF PLYOMETRIC TRAINING ON AGILITY PERFORMANCE OF MALE HANDBALL PLAYERS

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Abstract: The purpose of the study was to determine whether eight weeks of plyometric training can improve male handball players agility. To achieve the purpose thirty (30) male handball players were selected randomly from Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu. These players were divided into two groups namely, plyometric training group (15) and control group (15). The plyometric training group performed 2 days per week for eight weeks of plyometric training program and the control group did not perform any plyometric training. Agility of these players was measured by specific agility test T-test. The data was collected before and after training in both the groups. The collected data was analysed using analysis of covariance (ANCOVA). The result of the study showed that adjusted post test mean showed significant ($F = 17.96, p < 0.000$) difference among the groups on agility. It elicited that 0.61sec (4.91%) improvement was noticed in plyometric training group. It is concluded that plyometric training is an effective training technique to improve male handball players agility.

Keywords: Agility, T-test, Handball, ANCOVA.

Introduction

In handball players perform more often repeated short sprinting with change of direction [1]. These players perform 180 degrees turns over a small distance [2] and this sports to a great extent demand agility. Agility is the ability to start (or accelerate), stop (or decelerate and stabilize), and change direction quickly, while maintaining proper posture [3]. Agility requires high levels of neuromuscular efficiency to be able to maintain one's center of gravity over their base of support while changing directions at various speeds.

Handball players undergo various types of training to maximize their performance.



Plyometric training involves exercises that generate quick, powerful movements involving explosive concentric muscle contraction preceded by an eccentric muscle action [4]. These types of explosive muscular contractions can be seen in practical instances such as jump shot in handball. Researchers have shown that plyometric training, when used with a periodized strength-training program, can contribute to improvements in vertical jump performance, acceleration, leg strength, muscular power, increased joint awareness, and overall proprioception [5]. Plyometric drills usually involve stopping, starting, and changing directions in an explosive manner. These movements are components that can assist in developing agility [3,6-8]. Therefore, the purpose of the study was to determine whether eight weeks of plyometric training can improve male handball players agility.

Material and Methods

Subjects and variables

In this study 30 male handball players were selected randomly from Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu. The selected subjects were assigned into 2 groups: plyometric training group (n=15) and control group (n=15). All subjects were instructed to refrain from participation in any other form of training during the testing and training period that might improve their agility. The criterion variable selected in this study is agility measured by T-test. The independent variable selected in this study is plyometric training. The duration of the training prescribed in this study was eight weeks was carried out. Pre and post agility was measured on the field.

Protocol

The designed protocol of plyometric is including two times in a week with the Training volume ranged from 90 foot contacts to 140 foot contacts per session while the intensity of the exercises increased for seven weeks before tapering off during week eight so that fatigue would not be a factor during agility test [9]. The cone height is 40cm and barrier height is 50cm was used in this study.

Statistical technique

Pre and post test data were collected before and after 8 weeks of training. The collected data was analysed using analysis of covariance (ANCOVA). All the statistical tests were calculated using the statistical package for the social science (SPSS) for windows (Version 17).



Results

It is clearly from Table 1 that pre test on agility showed no significant difference. However, post and adjusted post test mean showed significant ($p < 0.000$) difference among the groups on agility.

Table 1: Analysis of covariance for three groups before and after training effect on agility

Testing Conditions	Groups		F	p
	PLYO	CON		
Pre (M ± SD)	12.21±0.337	12.10±0.165	1.349	0.255
Post (M ± SD)	11.61±0.523	12.10±0.180	11.78*	0.002
Adjusted (M ± SD)	11.57	12.13	17.96*	0.000

It is clear from table 2 that 8 weeks of plyometric training in plyometric training group resulted in 4.91% of improvement on agility of male handball players.

Discussion on findings

The research aims to investigate the effect of 8-weeks of plyometric on agility of male handball players. In the present study 0.60 sec (4.91%) improvement was noticed in plyometric training group on agility. This findings is in accordance with Miller *et al.*, (2006) [6]; Robinson and Owens, (2004) [10]; Young, McDowell, Scarlett, (2001) [11]; Alricsson, Harms-Ringdahl and Werner, (2001) [12]; Ebben, (2002) [13]; Bal, Kaur, Singh, (2011) [14]; Asadi and Arazi, (2012) [15]; Shallaby, (2010) [16]; Lim, Wee, Chan and Ler, (2012) [17]. Plyometric training show improved performance in agility tests either because of better motor recruitment or neural adaptations.

Conclusion

The plyometric training registered a significant improvement in agility in male handball players. Plyometric training which assist handball players to be agile while playing (Ebben, 2002) [13].



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