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Research Article

Effect of sports specific endurance circuit training on maximal aerobic speed of high school male basketball players during competitive season

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Abstract

The purpose of the study was to compare the abdominal strength endurance between handball and volleyball players of Annamalai University. We have selected thirty (30) male students who play either handball or Volleyball from Department of Physical Education and Sports Sciences, Annamalai University. These subjects were equally classified into two groups (handball = 15 and volleyball = 15). The selected subjects were tested on abdominal strength endurance by sit-ups test which was selected as criterion variable. The collected data was analysed using an independent t test to find out the significant difference between handball and volleyball players. The result of our study showed no difference in abdominal strength endurance between handball and volleyball players ($p < 0.05$). It is concluded that abdominal strength endurance plays a vital role in both game remain equal.

Keywords : Handball, Volleyball, abdominal strength endurance and sit-ups test

Introduction

Just over a century ago in Springfield, Massachusetts, a physical education instructor named *Dr. James Naismith* was looking for a game that could be played in indoors during cold winter months. He fastened two peach baskets to the gymnasium balcony and instructed students to throw a soccer ball into the baskets. This is how the game basketball was born. Initially there were no backboards, dribbling and seven persons played on a team. During the game a person had to sit on a ladder to pull the ball out of the basket and toss it back down to the players. Gradually changes and refinements were made until the game evolved into the one which played today.

Basketball is an aerobic-based anaerobic sport (Delextrat and Cohen, 2009) which requires high intensity activities such as jumping (for rebounds, blocks and shots), turns, dribbles, sprints, screens and low intensity activities such as walking, stopping and jogging. Frequent stoppages in games allow players to recover between bouts of activity, thus allowing repeated high-intensity spells of play (Drinkwater, 2008). Explosive strength, take-off power, speed, and agility are abilities that make an important contribution to efficient movement with and without the ball, thus play an important role in basketball technique and tactics. The importance of developing good conditioning programs based on the specific physiological demands of each sport is considered a key factor to success (Gillam, 1985; Taylor, 2003 and 2004). Basketball requires tremendous endurance, speed, agility, and power (Siegler *et al*., 2003). The focus of training for many years has been to enhance performance and gain advantages over other competitors. The purpose of the study was to evaluate the effectiveness of a basketball specific endurance circuit training on maximal aerobic speed of high

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Table – 1. Statistical analysis of maximal aerobic speed

Variable	Groups	Tests		*t*	*p*
		Pre	Post		
Maximal aerobic speed (meter /second)	Training group	3.04 ± 0.98	3.08 ± 0.66	2.864*	0.015
	Control group	3.03 ± 0.69	3.04 ± 0.79	1.114	0.289

*Values significant at $p < 0.05$ level of confidence

school male basketball players during the competitive season.

Methodology

Selection of Subjects

A total of twenty four (24) male high school basketball players were selected from Neyveli Lignite Corporation Sports School, Neyveli and St. Joseph Higher Secondary School, Manjakuppam, Cuddalore, Tamilnadu. These subjects were randomly distributed into two groups namely sports specific endurance circuit training group (N=12) and control group (N=12). The mean age of the selected players was 16.85 ± 0.67. The selected players had 3.8±3.1 years of playing experience and regularly participate in training prior to the commencement of this study. All subjects were subjected to medical examination by a general medical practitioner before participation in the study to ensure that there was of a sufficient standard to be able to take part in fitness testing and training.

Selection of Variables

The maximal aerobic speed was selected as dependent variables. The maximal aerobic speed was measured from beep test. The players completed level will provide maximal aerobic speed or distance divide by time, where distance in meters and time in seconds will provide maximal aerobic speed. The independent variable selected in the present study was sports specific endurance circuit training for 6 weeks. The sports specific endurance circuit training group underwent sports specific endurance circuit training and CG underwent regular basketball training.

Statistical analysis

The collected data were evaluated using paired *t test*. The proposed hypothesis was tested at 0.05 level of confidence. Beside this mean and standard deviation were also calculated. SPSS statistical software package (SPSS, version 17.0) was used. The α value of 0.05 was set for statistical significance.

Results

The result of the study showed that maximal aerobic speed (t = 2.864, p = 0.015) improved significantly in sports specific endurance circuit training group but control group (t = 1.114, p = 0.289) failed to show improvement (Table – 1).

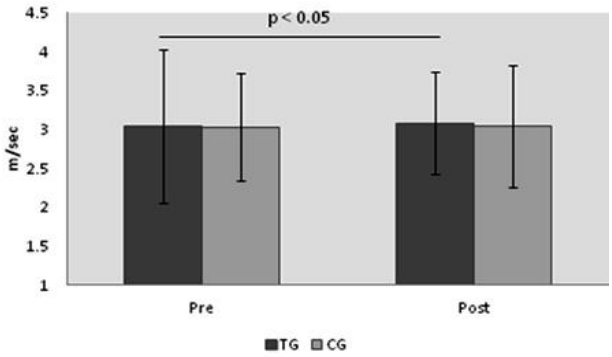

Fig.- 1. Percentage of changes in maximal aerobic speed in training and control group

Discussion

In the present study maximal aerobic speed of sports specific endurance circuit training group has improved significantly but no changes are noticed in the control group. Maximal aerobic speed was increased significantly 3.04 to 3.08 m/sec, which corresponded to an improvement of 1.13% (p=0.015) (Fig.-1). As there is an improve-

ment in MAS it is assumed that VO_2 max improves which require exercises eliciting and maintaining a high level of VO_2 max (Astrand and Rodahl, 1986), short, intermittent exercises are often proposed in training programs to increase VO_2 max (Franch *et al*. 1998; Krustrup and Bangsbo, 2001; Tabata *et al*. 1996).

Conclusion

Our result indicates that sports specific endurance circuit training group with sufficient recovery periods are useful to increase maximal aerobic speed of adolescent male basketball players during the competitive season.

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