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Effect of Small Sided Games Training on Resting Heart Rate and Maximal Oxygen Consumption among State Level Men Football Players

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Abstract

The purpose of this study was to determineEffect of Small Sided Games Training on Resting Heart Rate and Maximal Oxygen Consumption among State Level Men Football Players. The research was conducted on a sample of 30State Level Men Football players and their age ranged between 18 and 25 years. They were randomly divided into two groups: those undertaking a Small Sided Gamestraining (n=15) and a control group (n=15). The subjects took part in a Small Sided Gamestraining for five days a week for ten weeks. The subjects' Resting Heart Rate and Maximal Oxygen Consumption were assessed before and after the completion of the Small Sided Games training. The result shows that after the ten weeks of the Small Sided Gamestraining proved significant variation were found in the subjects' Resting Heart Rate and Maximal Oxygen Consumption in the experimental group (p<0.05). There were no significant differences in the control group after the experiment in terms of the same measures (P>0.05). The Small Sided Games training proved to be a useful training modality for football players and in terms of altering Resting Heart Rate and Maximal Oxygen Consumption.

Keywords: Resting Heart Rate, Maximal Oxygen Consumption and Small sided games.

Introduction

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. These games are less structured than traditional fitness training methods but are very popular training drills for players of all ages and levels. At present, there is relatively little information regarding how Small-sided games (SSGs) can best be used to improve physical capacities and technical or tactical skills in footballers. Small-sided games (SSGs), also referred to as skill-based conditioning games (Gabbett, 2006) or game-based training, (Gabbett, Jenkins and Abernethy, 2009) are modified games played on reduced pitch areas, often using adapted rules and involving a smaller number of players than traditional football games. These small-sided games develop physical abilities, as well as technical and tactical skills (Impellizzeri, et al. 2006&Dellal, et al. 2011). As far as physical condition is concerned, small-sided games develop aerobic capacity (Dellal, et al. 2008&Hill-Haas, et al.2011). Heart rate (HR) is the most common measure used for objectively monitoring training intensity in many sports, (Achten and Jeukendrup, 2003) and several studies have shown Heart rate (HR) to be a valid indicator of exercise intensity in football (Drust, Reilly and Cable, 2000 &Esposito, et al.2004). For example, the mean Heart rate (HR) and oxygen consumption (VO_2) relationship have been reported to be similar during treadmill based intermittent exercise that reproduced the demands of a football game.

More important for performance than average oxygen uptake during a game may be the rise in the rate of oxygen uptake during many short intense actions. A player's heart rate during a game is rarely below 65% of HRmax, suggesting that blood flow to the exercising leg muscles is continuously higher than at rest, which means that oxygen delivery is high. However, the oxygen kinetics during changes from low to high-intensity exercise during the game appear to be limited by local factors and depend on, among other factors, the oxidative capacity of the contracting muscles (Bangsbo et al., 2001; Krustrup et al., 2004; Nyberg et al., 2010). The rate of increase in oxygen uptake can be changed by intense interval training (Krustrup et al., 2004).

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Methodology

The purpose of the study was to determine the effect of small sided games training on Resting Heart Rate and Maximal Oxygen Consumptionamong state level men football players. In the present study 30 men student were selected by random sample from Andhra Pradesh. The subject chosen for this study were divided randomly into two equal groups called one control and

one experimental groups consisting of 15 players in each group. Their age ranged from 18 to 25 years. The investigator explained to them the purpose, importance of the experiment and the procedure to be employed and the testing procedure was also explained to them in detail. Ten weeks of small sided games training were given to the experimental groups. The control group was allowed to do their regular work. The experimental groups underwent the training programme as per the training schedule prepared the investigator. The training programme was held five days in a week for 10 week, the training was conducted. The tests selected for the study were standardized tests and most suitable for the present study. The investigator was present with subjects of the control group and the experimental groups during the experimentation of the pre test and the post test was conducted. The data collected were statically examined for significant differences, if any by applying analysis of covariance (ANCOVA). In all the cases, 0.05 level of confidence was used to test the significance, which was considered as appropriate.

Results

Table I. Results of ANCOVA between small sided games training and Control Groups on Resting Heart Rate

Test	CG	SSG	SV	SS	df	MS	F
Pre Test	70.20	71.27	Between	8.53	1	8.533	1.14
			Within	209.33	28	7.48	
Post Test	70.60	68.67	Between	28.03	1	28.03	4.20*
			Within	186.93	28	6.68	
Adjusted	71.04	68.23	Between	56.80	1	56.80	33.07*
			Within	46.37	27	1.72	
Mean Gain	0.40	2.60					

The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively.

Table II. Results of ANCOVA between small sided games training and Control Groups on Maximal Oxygen Consumption

Test	CG	SSG	SV	SS	df	MS	F
Pre Test	42.74	43.74	Between	7.55	1	7.550	1.05
			Within	201.50	28	7.20	
Post Test	41.95	46.61	Between	162.87	1	162.87	15.40*
			Within	296.14	28	10.58	
Adjusted	42.53	46.03	Between	88.21	1	88.21	100.72*
			Within	23.65	27	0.88	
Mean Gain	0.79	2.87					

The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively

In table I and II, the results of the ANCOVA for Resting Heart Rate and Maximal Oxygen Consumption are presented. In analysis of covariance, the final means are adjusted for differences in the initial means and the adjusted means of small sided games group and control group on Resting Heart Rate and Maximal Oxygen Consumption are tested for significance. From the table it can be seen that the calculated F value of 33.07 for Resting Heart Rateand 100.72 for Maximal Oxygen Consumption between groups is greater than the table value 4.21 indicating that it is significant ($P < 0.05$) for the degrees of freedom (1,27) at 0.05 level. The calculated F value indicated that there were significant alterations in Resting Heart Rate and Maximal Oxygen Consumption between the groups because of the training effect of small sided games training.

Figure I. Bar diagram showing the Initial and Final Adjusted Mean Values of Resting Heart Rate between Control and Small sided games groups

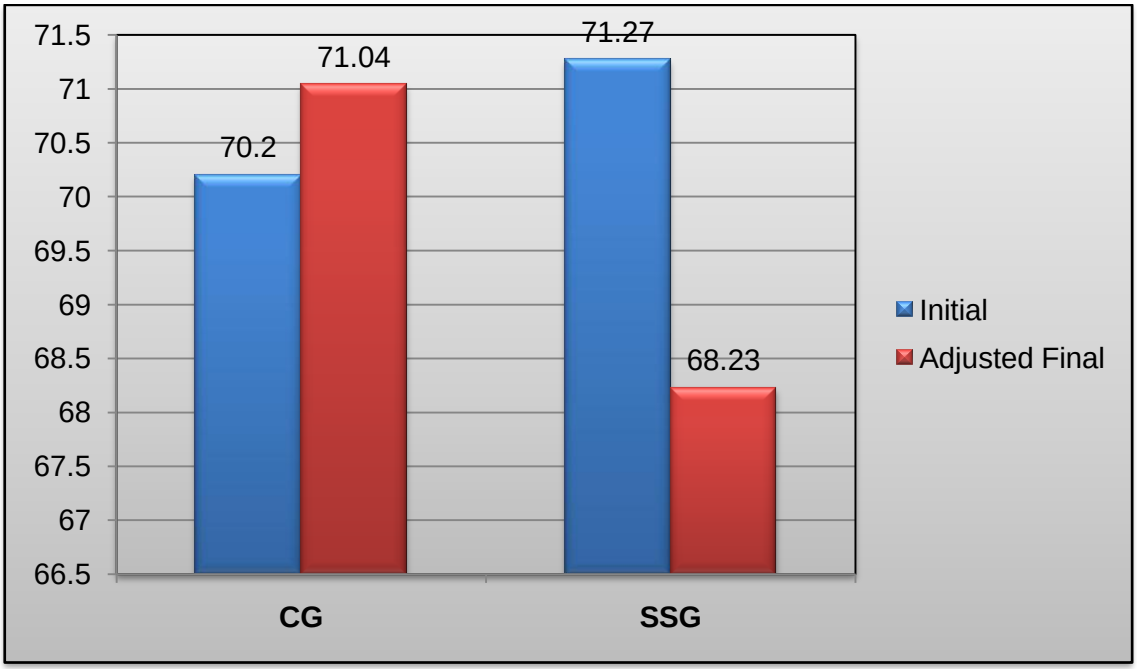
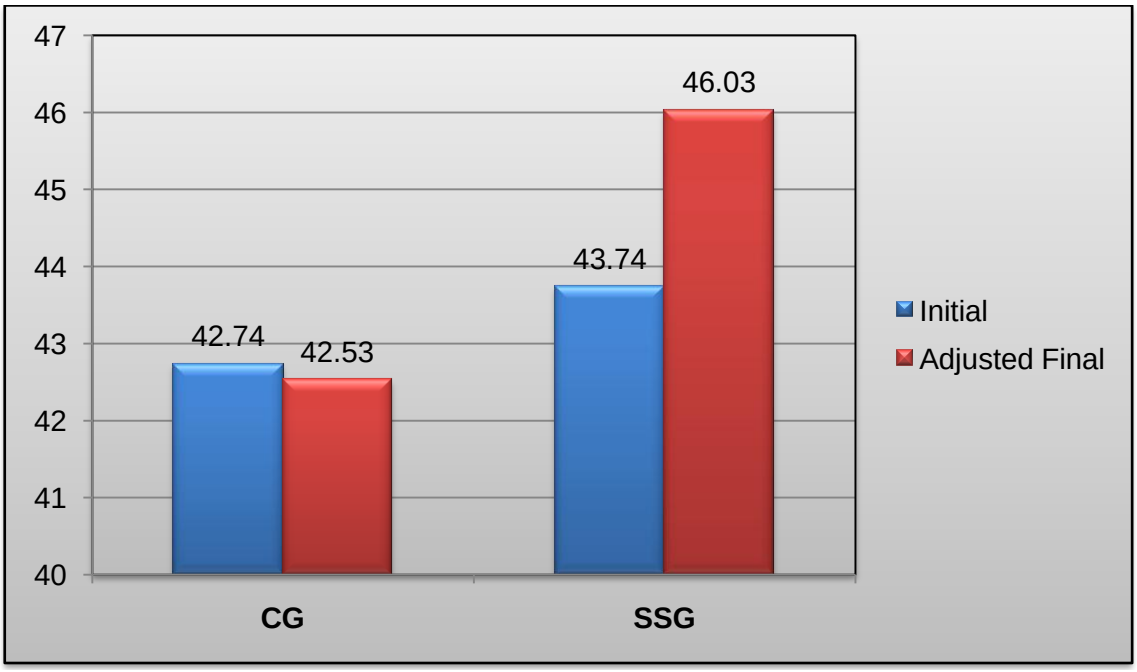


Figure II. Bar diagram showing the Initial and Final Adjusted Mean Values of Maximal Oxygen Consumption between Control and Small sided games groups



Conclusions

Physiological indicators are essentially found in the intensity, frequency and duration of matches and training sessions. During a match or training session, the physical effort causes physiological stress in the player, which characterizes the internal load that is generally seen in the physiological responses of the body to the effort exerted. The physiological level linear relationship between expenditure of energy (VO_2) and heart rate for all levels of intensity, the heart rate is very often used to estimate the intensity of the workload on the pitch; as it is easy to measure, it is a tool that allows the rhythm of the intensity of the activity to be monitored and adjusted. From the analysis of the data, There was a significant

difference existed between small sided games group and control group due to ten weeks of experimental training on Resting Heart Rate and Maximal Oxygen Consumption. Among the two groups, small sided games group significantly changed the Resting Heart Rate and Maximal Oxygen Consumption than that of Control group.

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