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RESEARCH ARTICLE

INFLUENCE OF VARIED INTENSITIES OF GAME SPECIFIC CIRCUIT TRAINING ON ENDURANCE OF MALE HANDBALL PLAYERS

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ABSTRACT

The purpose of the study is to assess the varied intensities of games specific circuit training on endurance of male handball players. thirty (30) male Inter Collegiate Handball players were selected from Alpha College of Engineering, Thirumazhisai, Chennai, Tamilnadu, India. These subjects were randomly distributed into three groups namely moderate intensity game specific circuit training group (MIGSCTG: n = 10), high intensity game specific circuit training group (HIGSCTG: n = 10) and control group (CG: n = 10). Endurance was selected as criterion variable and tested through Cooper twelve minutes run and walk test. The moderate and high intensity game specific circuit training was administered 3 days per week for eight week. The collected data was evaluated using two way repeated measures ANOVA on last factor. Interaction effect is significant for endurance, since the obtained *F* ratio of 61.29 is greater than the required table value of 3.3541 at □ = 0.05 for the df of 2 and 27. It is concluded that after eight weeks of training in MIGSCTG elicited 7.01% of improvement but HIGSCTG displayed 17.91% of improvement in endurance. This clearly shows that high intensity training effective in improving endurance greater than moderate intensity training.

INTRODUCTION

Sports play a very prominent role in the modern society. It is important to individual, a group, a nation and indeed the world. Throughout the world, sports has a popular appeal among people of all aged and both sexes. Much of the attraction of sports comes from the wide variety of experience and feeling that result from participation such as success, failure, exhaustion pain, relief and feeling of belonging. Sports can bring money, glory, status and goodwill. However, sport can also bring tragedy, grief and even death. Handball has become one of the most popular team sports at both the national and international level. The game of handball is played between two teams, each with six court players and a goalie. The objective of the game is to score as many goals as possible by dribbling, passing, and throwing the ball at the goal. While one team attempts to score a goal, the opposing team attempts to block and intercept throws. The six court players are positioned as follows: two wing players, two back-court players, one center back-court player, and one pivot player. The game is played over two periods of 30 minutes, with a 10-minute break between the periods.

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The game of Handball is a combination of intermittent and high intensity exercise, which places great physical demands on the body. The success of a handball player depends on aerobic and anaerobic performance (Boraczyński and Urniaz, 2008; Delamarche *et al.,* 1987). However, handball requires tremendous endurance, speed, agility, repeated sprint ability and power. It is concluded that high aerobic fitness is important for all position handball players among which wings players who perform the most picks and require high levels of aerobic capacity to aid recovery after high-intensity bouts of activity (Chittibabu 2013a). It is also found that maximal oxygen consumption showed strong negative correlation with repeated sprint ability (Chittibabu 2014a). In handball repeated sprint occur during a game were the players ran without fatigue. This clearly shows that repeated sprint require a greater aerobic fitness component with each successive sprint bouts (Bogdanis *et al*. 1996; Riechman *et al*. 2002). The purpose of the study is to assess the varied intensities of games specific circuit training on endurance of male handball players.

MATERIALS AND METHODS

Subjects

A total of thirty (30) male Inter Collegiate Handball players were selected from Alpha College of Engineering,

Thirumazhisai, Chennai, Tamilnadu, India. These subjects were randomly distributed into three groups namely moderate intensity game specific circuit training group (MIGSCTG: n = 10), high intensity game specific circuit training group (HIGSCTG: n = 10) and control group (CG: n = 10). 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.

Variables and test

Endurance was selected as criterion variable and tested through Cooper twelve minutes run and walk test. The VO_2 max was estimated through formula VO_{2max} = (22.35 x kilometers) - 11.29.

Training

The moderate and high intensity game specific circuit training was administered 3 days per week for eight week. All players were instructed to perform one circuit of 155 m course and their time were measured and recorded. The average time recorded was 78 seconds from which 60 to 70% load was fixed for moderate and 80 to 90% for high intensity.

Statistical technique

The collected data was evaluated using two way repeated measures ANOVA on last factor. The proposed hypothesis was tested at 0.05 level of confidence. Beside this mean and standard deviation were also calculated. SPSS statistic software package (SPSS Company, America, version 17.0) was used. The α value of 0.05 was set for statistical significance.

RESULTS

The result of the study reveals that there is a significant difference among MIGSCTG, HIGSCTG and CG on endurance irrespective of testing conditions, as obtained *F* ratio value of 6.246 is greater than the required table value of 3.3541 at α = 0.05 for the df of 2 and 27. Similarly, there is a significant difference on endurance at testing conditions irrespective of groups as obtained *F* ratio value of 162.135 is greater than the required table value of 4.210 at α = 0.05 for the df of 1 and 27. Therefore it is concluded that endurance has changed significantly from the start to the end of eight weeks of training. Further, the findings however disclose that interaction effect is significant for endurance, since the obtained *F* ratio of 61.29 is greater than the required table value of 3.3541 at α = 0.05 for the df of 2 and 27. The simple effect revealed that there is no significant difference between groups before training on endurance since the obtained *F* ratio 0.674 was less than the required table value of 3.3541 at α = 0.05 for the df of 2 and 27. On the other hand, after eight weeks of game specific circuit training displayed significant difference between the groups on endurance since the obtained *F* ratio 49.26 was greater than the required table value of 3.3541 at α = 0.05 for the df of 2 and 27. This clearly shows that endurance found to differ between groups after eight weeks of training. In the same way, within MIGSCTG endurance has changed significantly from the start to the end of eight weeks training, since the obtained *F* ratio value of 43.50 is greater than the required table value of 4.210 at α = 0.05 for the df of 1 and 27. Similarly, within HIGSCTG endurance has changed significantly from the start to the end of eight weeks training, since the obtained *F* ratio value of 241.189 is greater than the required table value of 4.210 at α = 0.05 for the df of 1 and 27. Since, groups differ after eight weeks of training Scheffé S post hoc test was applied and showed significant difference between the groups at 0.05 level of confidence for all comparisons. It also reveals that high intensity game specific circuit training found to be high when compared to moderate intensity game specific circuit training and control group. Table 1 clearly showed that the endurance has changed after eight weeks of MIGSCTG and HIGSCTG. Thereby Scheffé S post hoc test was applied and is presented in Table 1. It clearly shows significant difference at 0.05 level of confidence when compared between before training to after eight weeks of training in both MIGSCTG and HIGSCTG. MIGSCTG elicited 7.01% of improvement but HIGSCTG displayed 17.91% of improvement in endurance. It clearly show that high intensity game specific circuit training improved better than moderate intensity game specific circuit training on endurance. However, no change was elicited in the control group.

Table 1. Scheffé S post hoc test within the groups at different testing conditions on endurance

Groups	Pre test	Post test	MD	CI	%
MIGSCTG	44.6030	47.9690	3.366*	1.47	7.01
HIGSCTG	44.2380	52.1630	7.925*	1.47	17.91

*Significant at 0.05 level of confidence

DISCUSSION

In the present study MIGSCTG and HIGSCTG showed significant improvement in endurance among MIGSCTG elicited 7.01% of improvement but HIGSCTG displayed 17.91% of improvement in endurance. It also reveals that HIGSCTG greater improvement in endurance than MIGCSTG. Earlier, Chittibabu (2013) in his study showed that handball specific repeated sprint training for eight weeks is more effective in increasing aerobic capacity of men handball players. The training load adopted in repeated – sprint training with game specific which resulted in 11.79% of changes in aerobic capacity, however, the improvement in the present study is less. Similarly, (Helgerud *et al*., 2001) proved that aerobic power has been shown to improve in soccer players. Similarly, (Coutts *et al*., 2010) clearly state that game based training improves both fitness and skill. The present study clearly shows that four weeks of training resulted in 4.75% of improvement and 8.83% after eight weeks of training. This clearly shows that short duration of this training can improve aerobic capacity of male handball players. The improvement in aerobic capacity after the handball specific aerobic training protocol is consistent with the findings of previous studies in basketball (Chittibabu and Akilan 2013), soccer (Helgerud *et al*., 2001), handball (Chittibabu, 2014b) and rugby (Gabbett, 2006). The changes in aerobic capacity due to handball specific aerobic training may result in several changes in cardiovascular function, including increased maximal cardiac output, increased stroke volume, and reduced heart rate at rest and

during sub maximal exercise. The change in cardiovascular function with endurance training is resulted from an increase in maximal cardiac output, resulting primarily from improved stroke volume (Baechle and Earle, 2008).

Conclusion

It is concluded that game specific circuit training group improved endurance among male inter collegiate handball players. However, high intensity showed significant and greater improvement in endurance than moderate intensity.

REFERENCES

Baechle T.R and Earle RW. 2008. Essentials of Strength Training and Conditioning. 3rd ed., Champaign, IL: Human Kinetics, 127-128.

Bogdanis, G.C., Nevill, M. E., Boobis, L. H. and Lakomy, H. K. 1996. Contribution of phosphocreatine and aerobic metabolism to energy supply during repeated sprint exercise. *J Appl Physiol.*, 80(3): 876-84.

Boraczyński, T. and Urniaz, J. 2008. Changes in aerobic and anaerobic power indices in elite handball players following a 4-week general fitness mesocycle. *J. Hum. Kinet*., 19: 131-139.

Chittibabu, B and Akilan, N. 2013. Effect of sports specific endurance circuit training on peak anaerobic power and aerobic power of high school male basketball players during competitive season. *International Journal of Current Advanced Research*, 2(1): 48-50.

Chittibabu, B. 2013a. A comparison of aerobic capacity among male handball players in different playing positions. *International Scientific Journal of Sport Sciences*, 2 (1and2), 9-13

Chittibabu, B. 2013b. Effect of handball specific repeated – sprint training on aerobic capacity of male handball players. *International Journal of Physical Education, Fitness and Sports*, 2(4): 4-7.

Chittibabu, B. 2014b. Effect of small-sided handball game on aerobic capacity and repeated sprint ability of male handball players. *Turkish Journal of Sport and Exercise*, 16(2): 22-27.

Chittibabu, B.2014a. Estimation of relationship between maximal oxygen consumption and repeated sprint ability of male handball players. *International Journal of Physical Education, Fitness and Sports*, 3(2): 79-84.

Coutts A.J., Hill-Haas S., Moreira A and Aoki M.S.2010. Use of skill-based games in fitness development for team sports. *Brazilian Journal of Sport and Exercise Research*, 1(2): 108-111.

Delamarche, P., Gratas, A., Beillot, J., Dassonville, J., Rochcongar, P. and Lessard, Y. 1987. Extent of lactic anaerobic metabolism in handballers. *Int. J. Sports Med.*, 8: 55- 59.

Gabbett, T. 2006. Skill based conditioning games as an alternative to traditional conditioning for rugby league players. *J Strength Cond Res*., 20(2): 309-315.

Helgerud, J.L., Enge,n C., Wisloff, U and Hoff, J. 2001. Aerobic endurance training improves soccer performance. *Med Sci Sports Exerc*., 33(11): 1925-1931.

Riechman, S.E., Zoeller, R.F., Balasekaran, G., Goss, F.L. and Robertson, R.J. 2002. Prediction of 2000 m indoor rowing performance using 30 s sprint and maximal oxygen uptake. *J Sports Sci*., 20(9): 681-7.

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