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PHYSICAL EDUCATION

DESCRIPTIVE ANALYSIS OF FATIGUE INDEX BETWEEN BASKETBALL HANDBALL AND VOLLEYBALL PLAYERS

Dr M.RAJKUMAR

Associate Professor Department of Physical Education, Bharathiar University, Coimbatore, Tamilnau, India.

Abstract

The purpose of this study was to find out the fatigue index between Basketball, Handball and volleyball Players. Fifteen male students from Zion College of Physical Education, Kadappa were participant randomly sampled. The age of the participant was ranged from 21 to 25 years. The selected variables of fatigue index were assessed by using RAS test. Ensure the subject sprints maximally through the line each time. After 10 seconds, the next sprint starts from the opposite end of the 35 m track. Repeat this procedure until six sprints are completed. The obtained data were statistically analysed ANOVA was used to find out the significant difference, Tukey HSD test was used as a post-hoc test. An alpha level of 0.05 was used for all tests. The results indicate that there is significant difference between Basketball, Handball and volleyball Players.

Key Words: Fatigue Index and RAS test (Running based Anaerobic Sprint).

INTRODUCTION

The concept of finding fatigue index is not new to the research. Especially our country we lack of sports related field such as Exercise physiology, Sports nutrition, and Sports biomechanics and so on. The finding of fatigue index will shows us the energy system of player. It really asses the coach, to focus on the type of training by knowing the fatigue index of an individual. During intense exercise, muscle and blood lactate can rise to very high levels. Lactate accumulation causes an increased concentration of hydrogen ions and corresponding acidosis, a primary factor in muscle fatigue. Athletes with high fatigue index numbers should train to improve lactate tolerance in order to promote quicker recoveries from explosive bursts of speed and power. Lactate tolerance training usually starts midway through the pre-season, after an aerobic base has been built with continuous or interval training. Drills involving repetitions of sprints and shuttle runs produce high levels of lactic acid; as the body's tolerance to lactate grows, so does its capacity for efficient removal. The researcher investigates the fatigue index of Basketball Players, Handball Players and Volleyball Players. By investigating the energy system of player may give clear picture of the demands of an individual on food intake and proper technique to the Coach as well as Players.

METHODS

Fifteen male students from Zion College of Physical Education, Kadappa were selected as participant randomly. The age of the participant was ranged from 21 to 25 years. The selected variables of Fatigue index and Power (maximum and Minimum) were assessed by using Running based Anaerobic Sprint test.

PROCEDURE FOR RAST

Weigh each subject prior to the test for use in calculations, followed by a warm-up. Set up cones at each end of 35 meters of running track. Two testers may be required, as one person is required to time each run of 35 meters, the other to time the 10 seconds recovery period. The subject stands at one end of the 35m track, and starts a maximal sprint on the command 'go'. Ensure the subject sprints maximally through the line each time. After 10 seconds, the next sprint starts from the opposite end of the 35 m track. Repeat this procedure until six sprints are completed.

STATISTICAL TECHNIQUE

The obtained data were statistically analysed with ANOVA was used to find out the significant difference, Tukey HSD test was used as a post-hoc test. In all the cases the criterion for statistical significance was fixed at 0.05 level of confidence ($P<0.05$).

FATIGUE INDEX

The analysis of one way ANOVA on the data obtained for Fatigue index with the basketball, handball and volleyball players have been analyzed and presented in table I.

TABLE I
SUMMARY OF MEAN AND ONE WAY MEASURE OF ANOVA FOR THE FATIGUE INDEX

Mean and SD			Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Basketball Players	Handball Players	Volleyball Players					
3.10	4.01	5.57	Between	30.8086	2	15.4043	40.61*
± 0.219403	± 0.602	± 0.852	Within	10.241	27	0.3793	

*Significant at 0.05 level. Fatigue index was scored in watts/second.
(Table value required for significance at .05 levels with df2 and 27 is 3.35)

The obtained F-ratio among the fatigue index is 40.61 which is greater than the table value of 3.35 with df 2and 27 at .05 level of significance. It was concluded that there was significant difference between the players on fatigue index. Since the obtained F-test was significant, the Tukey HSD test was used to find out the paired mean difference and the results have been presented in table II.

TABLE II
TUKEY HSD TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS ON FATIGUE INDEX ON BASKETBALL, HANDBALL AND VOLLEYBALL PLAYERS

Mean			Mean Differences	Confidence Interval
Basketball Players	Handball Players	Volleyball Players		
3.10	4.01		0.96*****	0.68
3.10		5.57	2.47*****	0.68
	4.01	5.57	1.56*****	0.68

*Significant at .05 level.

Table II shows that the mean differences on heart rate between all the paired means were significant. The values are greater than the confidence interval value of 0.68, which shows significant difference at 0.05 level of confidence. It may be concluded from the results of the study that the Fatigue Index was higher with when compared each other players.

DISCUSSION ON FINDINGS

In the present study wing players showed lower total sprint time (32.75 sec) and lower fatigue index (7.60 %) than others. Previous studies has reported that wings players cover significantly greater total distance during the game than other players, whereas goalkeepers cover the least total distance (Luig, et al. 2008; Šibila, Vuleta, & Pori 2004). These differences were expected because of the wings specific task during a match. Wing players cover the largest distance during a match, compared to the pivots and backcourt players. In the phase of transition between defense and attack, they are the only players who run from one goal line to other goal line (approx. 35 m per transition), while the pivot players have to run from one 6 m goal area to the other 6 m goal area. Meaning they have to run 12meters less during each turnover and goal keeper moves hardly 20 meters. The ability to sprint repeatedly in quick succession is determined by the aerobic system's ability to resynthesize PCr, remove accumulated intracellular Pi,

and oxidize lactate during rest periods. Although several researchers have suggested that higher VO2max may faster recovery and promote multi sprint performance (Hamilton et al. 1991; Spencer et al., 2005; Tomlin & Wenger 2001). Bishop and his colleagues (2003) showed the existence of a stronger correlation between aerobic capacity and repeated sprint ability. Chittibabu (2013) who compared the aerobic capacity among different playing position handball players and identified that wing players showed greater aerobic capacity. These factors influences might have paved the route for difference and wing players.

CONCLUSIONS

On the basis of the finding of the study, the following conclusions were drawn.

1. There was significant difference between Basketball, handball and Volleyball Players.
2. Basketball Players have lower Fatigue index value when compared to Handball and Volleyball Player.

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