

The Effect of Fatigue on Soccer Players' Coordination Abilities

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ABSTRACT

Background: Coaches must translate what has occurred in the match into training activities which are linked to these guidelines. This must be done in such a way that they can be executed again in the matches, most coaches do not reach the final step, they do not reach further than creating general training exercises, which hardly have any relation to problems that occurred in the match, fatigue is one of the main problems which effect on performance skills and other variables, nonetheless, co-ordination abilities during matches and high intensity exercise are still controversial.

Aim: The aim of this study was to examine the effect of acutely induced fatigue on soccer players' coordination skills

Methods: The researcher used quasi-experimental method and conducted the study on a purposive sample (S) of (11) eleven experienced elite male soccer players performed three co-ordination abilities tests (dribbling 30 seconds, weight passing correctly to specified distance 15,25,35 m, and short dribbling test) prior to and after the implementation of an intensive and intermittent exercise protocol. In order to process the data T-test was used, the results revealed significant difference between pre-test and post-test values of co-ordination abilities test scores ($p < 0.01$). Heart rate before the shooting test was HR (89.28 \pm 4.03) bmp, and heart rate after fatigue was measured at (174.39 \pm 12.24) bmp.

Results: The results confirmed the study hypothesis regarding the negative influence of fatigue on co-ordination abilities (rhythm, differentiation, orientation).

Conclusion: It is concluded that coaches should train the players under exertion condition to decrease the effects of fatigue on co-ordination abilities level.

Keywords: co-ordination abilities, orientation, Differentiation, Rhythm, fatigue protocol

INTRODUCTION

There is enormous complexity in the sport of soccer for the coach to comprehend, the complexity depends on such factors as the continuous nature of the game, modern Soccer is the most popular sport in the world, at a high level is characterized by a large amount of high-intensity exercise performed during a game, which is physically demanding many activities, jumps, sprints, turns, tackles [4, 5].

Co-ordination skills, which are also described as "agility", "dexterity" or psychomotor skills, allow the player to control and adjust his movement and to master technical and technical/tactical skills and moves more swiftly. Co-ordination abilities can be improved with additional training exercises (e.g. playing other sports), or by integrated training sessions [1,3]. As is the case with speed training, co-ordination training should not be performed when the players are in a state of fatigue, as the control and learning processes cannot operate to their full potential. These exercises have to be repeated, drilled and gradually introduced into multiple-exercise sequences that work on all of the co-ordination skills required. Co-ordination exercises therefore constitute an excellent preparation phase for technical and tactical/technical training. It is not possible to train co-ordination skills in an optimum way unless they are combined with factors related to physical condition, namely speed, strength and endurance. A highly talented and technically skilled player often has better developed co-ordination skills than other players. If a player is able to control his movements well and possesses good co-ordination abilities, this will increase his confidence, which will, in turn, have a positive influence on the development of his personality.

Fatigue that is experienced during a soccer game is manifested by a reduced capacity to perform actions of high intensity in addition to a progressive reduction of muscle strength. Therefore, fatigue resistance is one key factor which may help improve the performance of a soccer player. Fatigue is indicated by a reduction of maximal force or power that is associated with sustained exercise and is reflected in a decline in performance [13]. It can be considered as a performance constraint that affects the motor skills and the perceptual processing that is linked to the execution of skills required for high game performance [9, 10].

To our best knowledge only some studies [2,4,5,7,8,9,11,12] examined the effects of fatigue on soccer skills, this is the first study that investigate the influence of fatigue on Co-ordination abilities which lie at the root of all skilled technical moves.

MATERIAL AND METHODS

Participants: eleven elite male soccer players playing in the first division Palestinian league, participated in this study during competitive first period, all the players trained daily. All were informed about the experimental procedures and tests.

Procedures: After a general warm up for 15 minutes for the whole body, which included kicking, jogging drills, the co-ordination abilities (Rhythm, orientation, differentiation) were tested from the subject:

-Rhythm ability: Dribbling test 30 seconds, the subjects try to dribble the ball from leg to head for 30 seconds,

-Differentiation ability: weight Passing correctly 18 balls to specified distance (15m,25m,35 m) (6 balls to each distance)

-Orientation ability: short dribbling test with ball fig.2. player with regular ball, immediately after wards, embarked upon the circuit (fig.1), which consisted specific drills, jumping, skipping, sprinting and slow run. Players performed the circuit 5 times with 2 minutes' rest after each circuit. If a participant completed the circuit less than 90s, he continued anew round until the target time was reached at 75-95% of maximal heart rate. A heart belt was used to monitor the intensity. After finishing the last circuit with (2) minutes rest, co-ordination abilities were tested again.

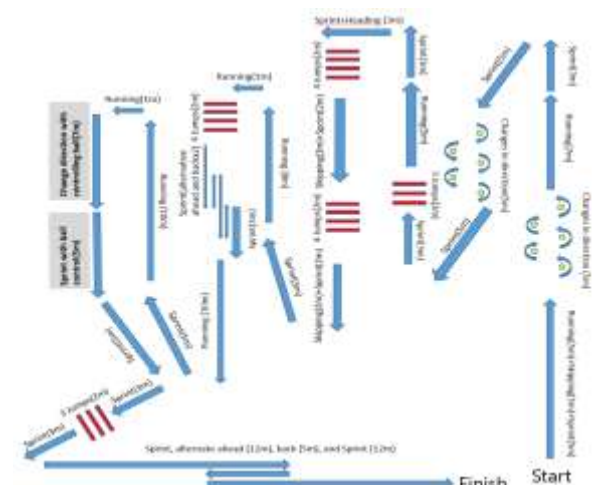


Fig. 1: Circuit design



Fig. 2: Short dribbling test

RESULTS

Eleven soccer players (age= 24.27±6.2 years, height=177±5.4cm, weight=68.36±10.64 kg) participated in the present study. The

Table 2: Paired samples t test to determine the differences between pre and posttests of some coordination variables (n=11)

Variables	Tests	Pre-test		Post-test		T-value	P-value*
		M	SD	M	SD		
Rhythm	Dribbling	41.09	2.66	37.55	1.57	8.593	0.00*
Differentiation	Weight pass correctly(15.25.35m)	14.73	1.27	12.09	1.04	12.969	0.00*
Orientation	Short dribbling test	10.45	1.12	11.54	1.12	6.70-	0.00*

The Average HR at pre-test was 75% to 95% percent of the (HR max =193.27 ±4.73beat/min). Accordingly, the participant's co-ordination abilities were examined at sub-maximal fatigue level.

DISCUSSION

The purpose of this study was to determine the effect of fatigue on some co-ordination abilities (rhythm, differentiation, and orientation). the main finding was that rhythm, orientation, and differentiation were affected at sub-maximal of the fatigue level.

Fatigue may be correlated to muscle activity, decrease EMG amplitude, decreases force production, proprioception by affecting the joint position sense, cognitive function which interfere with executive function of motor performance [5].

The effect of fatigue on co-ordination abilities can be attributed to changing in The ability of a player to position himself correctly in terms of both space and time. Changing and readjusting the position of the body on the basis of the perception of a given situation, affecting the ability that allows the player to deal in different ways with the information that he perceives with his sensory organs, and decrease The ability that allows the player to execute movement rhythmically.

blood lactate level and decreased muscle glycogen. These factors resulted in impaired neuromuscular performance which affected coordination and subsequently the participant performance skills.

CONCLUSION

The participants' co-ordination abilities decreased when they were at fatigue level; accordingly, it is very important for soccer coaches to recognize the level of fatigue influence on player's performance, therefore they should train the players under exertion condition to decrease the effects of fatigue on co-ordination level. If the coaches are able to identify the level at which each player is affected by fatigue, this can help them build better match strategies.

Conflicts of interest: No potential conflict of interest relevant to this article was reported.

researcher found that rested heart rate average (HR rest=64.09±3.91bmp) and maximal heart rate was (HR max=193.27±4.73bmp). Heart rate before co-ordination tests was (HR pre= 124 ±7 bmp) and heart rate average at fatigue level after the fifth circuit was (HR post=173.64±11.36 bmp). table 1.

Table 1: Descriptive statistics for soccer players

Variables	Mean	Standard deviation	Skewness
Age (Year)	24.27	3.66	0.27
Height (Meter)	177.55	3.47	0.40-
Body mass (Kg)	68.36	4.71	0.43
HR Rest	64.09	2.62	0.24
HR Max	193.27	3.46	0.07
HR Pre	124	5.32	0.25-
HR Post	173.64	5.95	0.56

The co-ordination abilities test average value at rested condition were: rhythm (41.09), differentiation (14.73), and orientation (10.45), while an average of (37.55) rhythm, (12.09) differentiation, and (11.54) orientation, were measured at fatigue level. The test score showed significant difference between pre-and post-test co-ordination abilities average (t (df=10); p<0.01) (table 2.)

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