04 - THE FITNESS LEVEL OF CBF REFEREES IN A PERIOD OF SEVEN YEARS

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INTRODUCTION

Due to the higher demand of physical preparation of the referees to conduct a modern football match and due to the intention of improving the level of international referees, in 1990, during the World Cup, the *Fédération Internationale de* Football Association (FIFA) determined that to be in their a referee could not be older than forty five years in order to be able to hold FIFA licenses. Moreover, since 1989, they suggest that the referees are tested for fitness (Rontoyannis et al., 1998).

Aiming at improving the performance of the football referee, since 2000, thus quite recently, some academic studies on the fitness level of referees have been made (KRUSTRUP and BANGSBO, 2001; REBELO et al., 2002; Da SILVA, 2002; WESTON et al., 2004, Da SILVA, 2005). These studies intended to provide specialization to the training sessions of the referees, because the activities performed by this professional require specific training sessions. There was a great evolution in training, as well as in the way the results in a training session were measured. Fitness tests that express the fitness levels of the referees during a football match are still being studied and suggested by scientific references (KRUSTRUO and BANGSBO, 2001; REBELO et al., 2002; Da SILVA et al., 2002a; Da SILVA et al., 2004). Recently (2001), FIFA established a new sequence for the anaerobic and aerobic tests that are part of their battery.

It is evident the need of investing in studies that approach the physical performance of football referees, avoiding, then, that mistaken decisions caused by lack of physical fitness during a match spoil the match. Thus, this paper aims at determining the amplitude of the decrease of fitness of the referees from Federação Paranaense de Futebol - FPF (Paranaense Football Federation), who hold CBF licenses, for a period of seven years.

MATERIALS AND METHODS

Subjects were 24 referees from FPF who hold Confederação Brasileira de Futebol CBF (Brazilian Football Confederation) licenses. They took the fitness tests from the Committee of Fitness assessment from FPF in 1997, 2000, and 2004. all the tests were taken on the same day, in the morning.

The battery of tests is formed by: a twelve-minute run (COOPER's test), and alternately, two 50 m sprints, two 200 m sprints. The tests followed this order: first, the 12 minute run, followed by a 50 m sprint; then a 200 m sprint, followed by another 50 m sprint. Finally, one more 200 m sprint. The recovery time during the tests was not less than 5 minutes.

The minimum distance for a referee to be considered apt in the 12 minute run is 2,700 meters, according to FIFA. But the maximum time in the 50 meters run is 7.50 seconds, and for the 200 meter run, 32 seconds.

The test results are reported as mean and the respective standard error and were evaluated by a variant analysis (ANOVA), an entirely casual model, followed by the TUKEY test to identify the differences between the pairs of statistically significant means. The data were statistically considered for significant when the probability of the null hypothesis is less than 0.05.

RESULTS AND DISCUSSION

When the subjects are indicated to be part of the CBF board, they have their functions pre-defined already, that is, the ones who enroll as referees will act as referees, and those who enroll as assistants will act as assistants. However, in the state federations the subject may act either as assistant or as referee.

In 2001, FIFA, the most important football institution, changed the order of application of the fitness tests that are part of the battery. Until 2001, the aerobic fitness tests (Cooper tests) were executed before the anaerobic fitness tests (50 m and 200 m runs). With this change, the anaerobic fitness tests began to be executed after the aerobic fitness test, as it is mentioned in the methodology.

Despite the fact that there were no statistically significant changes between the distances covered by the referees and the distances covered by the assistants ($p > 0.05$), in either 1997, 2000, or 2004 assessment results (Table 1). In absolute terms it is observed that the referees obtained lower performance index than the referees in all evaluations.

Table 1 Results obtained by the referees and the assistants in the Cooper test.

	Year	N	Mean	SD
Referees	1997	12	2943.33 (2700 – 3300)	212.06
	2000	12	2913.33 (2700 – 3100)	151.74
	2004	12	2815.00 (2580 – 3150)	162.06
Assistants	1997	12	3065.00 (2750 – 3330)	222.61
	2000	12	3001.67 (2800 – 3260)	158.39
	2004	12	2899.17 (2650 – 3400)	202.10

The football referee covers more than 9 km during the match (ASAMI et al., 1988; JOHNSTON and MCNAUGHTON, 1994; Da SILVA and RODRIGUEZ-AÑEZ, 1999; D'OTTAVIO and CASTAGNA, 2001; KRUSTRUP and BANGSBO, 2001; REBELO et al., 2002), in an average area of 8.250m^2. However, the assistant referee covers a distance of about 7km during a football match (Da SILVA and RODRIGUEZ-AÑEZ, 2002; KRUSTRUP and BANGSBO, 2002), in a straight line (side line) that on average corresponds to 60 meters. As the physical strain of the referee during a match is higher than the assistant's physical strain, it is expected that the referee shows better results in the aerobic fitness test, because one of the main factors for good refereeing is a good fitness level (CATTERALL et al., 1993 EISSMANN, 1996; REBELO, 2002; Da SILVA, 2002).

Tabela 2 Referees and assistant referees results in the 50 m sprint.

	Year	N	Mean	SD
Referees	1997	12	6.73 (5.84 – 7.29)	0.42
	2000	12	6.84 (6.03 – 7.29)	0.37
	2004	12	7.16 (6.50 – 7.63)	0.30
Assistants	1997	12	6.77 (6.30 – 7.30)	0.29
	2000	12	6.86 (6.33 – 7.47)	0.32
	2004	12	7.00 (6.69 – 7.72)	0.22

Table 2 shows the results for the test that measures the speed (50 m run) of the referees and assistants. The result analysis demonstrate that in 1997 and 2000 the mean time spent on this test, that is the sum of the first and second, the referees and the assistants did not show significant differences. However, in 2004, the sum of the two runs demonstrates that the referees present a lower fitness level in this test, although the difference cannot be considered significant between these values (p> 0.05). The mean time found on this study is similar to the one found in scientific literature, where, for instance, Da Silva and Rodriguez Añez, 2003, state that when they evaluated 16 referees from CBF, the mean time was 6.81 ±0.31 s, the average of 6.93 ± 0.37 was obtained by 209 referees from Brazil (Da SILVA et al., 2004). The 52 referees that took part in the competition for new referees for FIFA of the Union European Football Association (UEFA) in 1995, presented a time of 7.09 s (EISSMANN, 1996)According to Da Silva et al. (2002b), the physical ability speed must be trained constantly by the referees during their training sessions, because it will let them be closer to the ball after a counter-atack situation in case he has to analyze some error or interfere with the play.

Table 3 Results obtained by the referees and the assistants in the 200 meter run test.

	Year	N	Mean	SD
Referees	1997	12	26.67 (24.54 – 28.02)	1.06
	2000	12	28.54 (24.57 – 30.40)	1.62
	2004	12	29.78 (24.20 – 32.26)	2.12
Assistants	1997	12	27.13 (24.70 – 29.80)	1.45
	2000	12	27.75 (24.91 – 29.67)	1.36
	2004	12	29.80 (27.21 – 31.70)	1.44

The physical ability speed and its variable resistance, to speed are important for refereeing, because they allow the referee to be closer to the ball at the moment he has to analyze a play. No statistically significant difference was found when the means obtained by the referees and the assistants were compared (table 3) in the 200 m run (p> 0.05). at every 4.3 seconds the referee changes his locomotor action during the match, performing around 1 268 different activities during the match (KRUSTRUP and BANGSBO, 2001). For Catterall et al. (1993) this change would take place every 6 seconds. The assistant referee present less physical strain than the referee, performing, on average, 943 different locomotor actions during a match (KRUSTRUP and BANGSBO, 2002).for such physical activity, that must be sustained for a period of 90 minutes, the referees should present a level of aerobic and anaerobic fitness higher than the one found in this study.

CONCLUSION

About three years ago, the institution that represents the referees at FPF, suspended the fitness program that they offered to their referees, and the Comissão de Arbitragem da FPF (Refereeing Committee) did not make the fitness tests as frequently and as seriously as they used to do in the previous years. This could explain the decrease in the physical performance of the referees. However, in 2001, as it was mentioned before, FIFA made changes in the order in which the tests occurred. According to Da Silva et al. (2002 a) this change caused a reduction in the times presented by the referees in the anaerobic tests. But in a study that was published right after this change, Da Silva et al. (2003) observed that when the 12 minute run is performed before the anaerobic runs, the referee would present better results in the aerobic test, which did not occur when the test was applied in 2004, that is, the time the referee spent on this test decreased, when compared to the previous evaluations. Due to these facts it was not possible to determine the real cause of reduction in performance of the referees in the fitness tests.

Future studies determining the anthropometric profile and the fitness level of the referees according to the order of tests will be important to get to know better the characteristics and the physical needs of the football referees. Due to the improvement in the performance of the football players, thus an increase in the rhythm of the game, suggesting to the referees to do some physical exercise frequently is not enough anymore. Today it is necessary to make them perform specific training sessions, aiming at giving them physical conditions to follow the rhythm of modern football.

The investment made by the clubs nowadays by the TV broadcasts and by many companies that want to see their brands connected to football, does not allow the referee to act carelessly, because his decisions, if mistaken due to the lack of fitness, may damage the evolution of a team in the championship. The committees of referees in the federations and confederations must evaluate the referees frequently, and also offer them fitness training sessions, in order to improve their fitness levels so that they can have a better performance in the football matches.

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ABSTRACT

This study aims at analyzing the level of physical capacity of professional referees for seven years. The population in this study was formed by referees from the Soccer Federeation in Paraná (Federação Paranaense de Futebol), credited by CBF, who presented themselves to the Physical Evaluation Committee from FPF to do the physical capacity tests in 1997, 2000, and 2004. The sample was formed by 24 male referees, and the criteria for selection was the referee's participation in the physical tests in 1997, 2000, and 2004. the battery of tests used was the one indicated by FIFA, that is made of: a 12 minute run (Cooper's test), two 50 m sprint, 200 m sprint, with the two last tests being done alternately. The analysis of the results showed that during the seven-year period there was a decrease both in the aerobic and anaerobic power, and this reduction in the performance could be attributed to the lack of seriousness of the Refereeing Committee at the moment they applied the tests, the fact that the classes for physical preparation were not offered by Association of Referees in Paraná (Associação dos Árbitros do Paraná) anymore, and the lack of a constant physical activity that should be performed by the referees.

Key words: soccer / football referee, physical condition, physical test, FIFA.

CAPACITÉ PHYSIQUE D'ARBITRES DE CBF AU LONG DE SEPT ANS

RÉSUMÉ

Cette étude a eu comme objectif analyser le niveau d'aptitude physique des arbitres professionnels au long de sept ans. La population de cette étude a été constituée des arbitres de la Fédération Paranaense de Football (FPF), de créance par la Confédération Brésilienne de Football (CBF), qui se sont présentées à la Commission d'Évaluation Physique de FPF afin de réaliser les preuves d'aptitude physique dans les années: 1997, 2000 et 2004. L'échantillon a été composé de 24 arbitres, du sexe masculin, étant défini comme critère d'élection la participation de l'arbitre dans les essais physiques de 1997, 2000 et 2004. La batterie d'essais utilisée a été établie par FIFA et c'est constituée de : une course de 12 minutes (test de COOPER), deux courses de 50 mètres, deux courses de 200 mètres, étant ces dernières appliquées de forme alternative. L'analyse des résultats a montré qu'au long des sept années s'est produit une chute de la capacité aérobie et anaérobie, pouvant cette réduction de la performance être attribuée au manque de sérieux de la Commission d'Arbitrage au moment de l'application des tests, au retrait des leçons de conditionnement physique offert par l'Association des arbitres du Paraná et l'absence d'une activité physique constante de la part des arbitres.

Mots clés : arbitre de football, aptitude physique, test physique, FIFA.

CAPACIDAD FÍSICA DE ÁRBITROS DE LA CBF A LO LARGO DE SIETE AÑOS

RESUMEN

Este estudio tuvo como objetivo analizar el nivel de aptitud física de los árbitros profesionales al longo de siete años. La población de este estudio fue constituida por árbitros de la Federación Paranaense de Fútbol Brasil (FPF), credenciados por la Confederación Brasileña de Fútbol (CBF) que se presentaron a la Comisión de Evaluación Física de la FPF para realizar las pruebas de aptitud física en los años de 1997, 2000 y 2004. La muestra fue compuesta por 24 árbitros, del sexo masculino, siendo definido como criterio de selección la participación del árbitro en los tests físicos de 1997, 2000 y 2004. La batería de tests utilizada fue la establecida por la FIFA, que es constituida de: una carrera de 12 minutos (test de COOPER), dos carreras de 50 metros, dos carreras de 200 metros, siendo estos últimos aplicados de forma alternada. El análisis de los resultados mostró que a lo largo de los siete años hubo una queda de la capacidad aerobia y anaerobia, pudiendo esta reducción de la performance ser atribuida la falta de seriedad de la Comisión de Arbitraje en el momento de la aplicación de los tests, la retirada de las clases de condicionamiento físico ofertadas por la Asociación de los árbitros de Paraná y la ausencia de una actividad física constante por parte de los árbitros.

Palabra clave: árbitro de fútbol, aptitud física, test físico, FIFA.

CAPACIDADE FÍSICA DE ÁRBITROS DA CBF AO LONGO DE SETE ANOS

RESUMO

Este estudo teve como objetivo analisar o nível de aptidão física dos árbitros profissionais ao longo de sete anos. A população deste estudo foi constituída árbitros da Federação Paranaense de Futebol (FPF), credenciados pela Confederação Brasileira de Futebol (CBF) que se apresentaram à Comissão de Avaliação Física da FPF para realizarem as provas de aptidão física nos anos de 1997, 2000 e 2004. A amostra foi composta por 24 árbitros, do sexo masculino, sendo definido como critério de seleção, a participação do árbitro nos testes físicos de 1997, 2000 e 2004. A bateria de testes utilizada foi a estabelecida pela FIFA, que é constituída de: uma corrida de 12 minutos (teste de COOPER), dois piques de 50 metros, dois piques de 200 metros, sendo estes últimos aplicados de forma alternada. A análise dos resultados mostrou que ao longo dos sete anos ocorreu queda da capacidade aeróbica e anaeróbica, podendo esta redução da performance ser atribuída a falta de seriedade da Comissão de Arbitragem no momento da aplicação dos testes, a retirada das aulas de condicionamento físico ofertada pela Associação dos árbitros do Paraná e a ausência de uma atividade física constante por parte dos árbitros.

Palavra chave: árbitro de futebol, aptidão física, teste físico, FIFA.