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A Comparison of Match Analysis in Soccer within the Context of Offside Rule Revision

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Abstract

The purpose of this study is to evaluate the effect of a revised offside rule on the activity profile of players and the technical technical actions compared with matches played using the regular offside rule. A home/away league was established for the purpose of this study. For every home/away match, one game was played using the regular offside rule and other was played using the revised offside rule. The distance covered by 82 players during the games was measured by GPS. A computerized match analysis program was used for the notational analyses. A computerized match analysis program was used for the notational analyses. The total distance (8938.2 m; 8480.8 m; respectively), walking (4538.6; 4327.5; respectively), jogging (2328.4; 2224.2; respectively), moderate (1314.7; 1215.1; respectively) and high-speeds (515.2; 455.9; respectively) by players were significantly greater in competitions using the revised offside rule than in games using the regular offside rule. The number of short passes and dribbling were higher in competitions using the revised offside rule, whereas the number of long passes and offside calls were significantly decreased. Total distance covered in the matches played with the Revised Offside Rules was significantly greater than in matches played with the regular offside rule.

Keywords: Match distance covered, offside, notational analysis

INTRODUCTION

The “offside rule”, implemented in 1925, has been controversial in football since its inception (Maurenda, 2004). The offside rule is presently defined in “Laws of the Game” (FIFA, 2013) player nearer to his opponents’ goal line than both the ball and the second-last opponent. In such an instance, the offside rule becomes active and the referee stops the game.

In 2010, FIFA president Sepp Blatter, has been declared to press that it is necessary to make radical changes in offside rule (Wilson, 2010). In fact, Blatter intends to remove offside rule entirely. However, abiding by the offside rule requires high levels of attention, concentration, and the ability to make the right decision, both for the player who is passing and for the player who is receiving the pass. Since the offside rule applies only for one half of the pitch, the defenders of the attacking team take position close to the mid-field line to limit the field of play and to give support to the offense. The result is that more players spend time positioned in the middle of the field. In modern soccer, the active playing field has shrunk due to the increased physical abilities of the players and more highly developed defensive techniques. For these reasons, it might be considered that making a revision for offside rule instead of removing.

For international matches, the standard length of a pitch is between 100 and 110 m (FIFA, 2013). Because of the offside rule, only half of the pitch (50 to 55 m) is actively used. If the rules were changed so that the pitch was divided into three equal parts and the offside rule was applied to only one-third of the playing field, then the remaining two-thirds of the playing field (66 to 77 m), might see more active play. Such a modification is named as” Revised Offside Rule” (figure 1). By decreasing the area restricted by the offside rule, the active playing area would be enlarged. Players would be less constricted and have more space to be active. If this rule was implemented, it would open the field for more active play, and spectator satisfaction, one of the main aims of soccer, would most likely increase during the matches.

The aim of this study is to measure the differences in matches which use the revised offside rule (ROR) and the standard offside rule (OR), with regard to the number of short passes, long passes, off-sides, tackles, shots, feints, scoring positions, length of the game, activity profile of players, and speed ranges in which these distances are covered. We hypothesized that revising the offside rule would result, (1) enhance the total distance covered and (2) increase the number of goal possession during a soccer match.

METHODS

Research Group

Combined total of 82 male players (mean age 17±1 years old), participated in the study. Six soccer teams in a U17 and U18 league in Local Amateur League in Izmir-Turkey took part in the study. Only the players which completed the two consecutive matches with two different offside rules were included in the study. The project was approved as a non-invasive study by the Local Ethics Committee with the number of 2011/04-03. Administrators, trainers, players, and the families of the players were given information about the study and written consent was collected from participants in accordance with the Declaration of Helsinki.

Data Collection Instruments

The distances covered by the players and their running speeds were measured using GPS devices which is approximately 50 grams in weight (VXsport, Wellington, New Zealand) attached to the waists of the players using custom-made belts. The same GPS units were used by the same player for two consecutive matches. In recent years, GPS devices have been effectively used for measuring distances covered by players and their running speeds (Vescovi, 2012; Barbero-Alvarez et al., 2012; Gomez-Priz et al., 2011).

To determine the distances covered by the referees during matches, the number of steps they took during each match was measured using pedometers (Kenz EX, Japan). The total steps taken by the referees were tallied in order to determine approximate workloads during matches.

All matches were recorded using a high definition video camera (Sony DCR-SR15E, Japan).

The number of short passes, long passes, feints, tackles, shots, scoring positions and offside violations were determined using analysis software (e-analysis, Turkey). The criteria for technical actions such as short passes, long passes, etc. were similar to those used in other studies (Rampinini et al., 2009).

Data Collection

Teams participating in the study were numbered 1, 2, 3, 4, 5, and 6. Each team played the other teams twice. The second match between two opponents was played three days following the first match. A total of 30 league matches were played. By random assignment, 15 were played using the OR and 15 played using the ROR (Table 1). The matches were played on a 105 x 60 m field. For matches played by the ROR, the pitch was divided into three equal parts of 35 m each (Figure 1).

Table 1. Fixture of the Matches

Week	Day	Match
1. Week	Tuesday	1-2 / 3-4 / 5-6
	Friday*	1-2 / 3-4 / 5-6
2. Week	Tuesday*	2-3 / 4-5 / 1-6
	Friday	2-3 / 4-5 / 1-6
3. Week	Tuesday	1-3 / 2-4
	Friday*	1-3 / 2-4
4. Week	Tuesday*	1-4 / 2-5 / 3-6
	Friday	1-4 / 2-5 / 3-6
5. Week	Tuesday	1-5 / 2-6
	Friday*	1-5 / 2-6
6. Week	Tuesday*	3-5 / 4-6
	Friday	3-5 / 4-6

*Match days played using the revised offside rule (ROR)

The match activity profile of players was measured and compared regarding use of the OR or ROR.

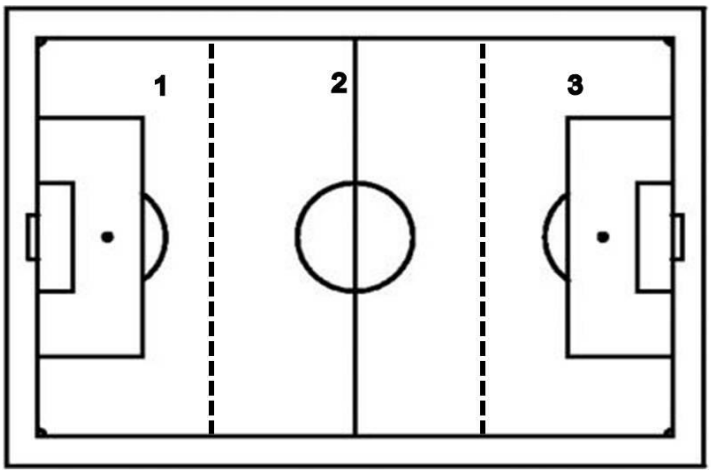

Figure 1. Revised Offside Rule Lines.

In all matches, regulations such as time, clothing, pitch measurements, and number of substitutions were applied according to the Federation Internationale de Football Association (FIFA) rulebook. Certified referees conducted each match. Before the study matches were played, the coaches, players, and referees received detailed instructions about the ROR.

Running speeds were categorized as follows: 1. Walking (0-6.9 km/h) 2. Jogging (7-11.9 km/h) 3. Medium-speed running (12-16.9 km/h) 4. High-speed running (17-21.9 km/h) 5. Sprinting (>22 km/h), (Malone et al., 2016). The total distance covered by a team during a match was measured. Due to equipment limitations, in each match, the players of only one of the teams wore the GPS devices. Goalkeepers did not wear a GPS.

A chronometer was used to record the time in which the ball was in active play. This included when the clock was running but did not include when the game had been stopped for free kicks, timeouts, substitutions, or similar stoppages of play.

Data Analysis

Data analysis was performed using SPSS 15.0. for Windows. Before using parametric tests, the assumption of normality was verified using tests for skewness and kurtosis. Therefore, the Paired t-test provided a hypothesis test of the difference between means of distance covered and notational analysis variables of OR and ROR for a pair of random samples. Statistical significance was determined as $p<0.05$. Data are presented as mean values ± standard deviation.

RESULTS

Distances covered by walking, jogging, medium-speed running, and high-speed running, and total distance covered by players in matches in which ROR was used were significantly greater than in matches in which OR was used (Table 2). Sprinting distances in the matches played under the different rules were not significantly different.

Table 2. Total distance covered and distances covered (mean±SD) at various running speeds in matches played according to standard offside rules (OR) and revised offside rules (ROR).

	OR (n=15)	ROR (n=15)
Total distance (m)	8480.8 ± 622.4	8938.2 ± 432.1*
Walking (m)	4327.5 ± 320.7	4538.6 ± 219.8*
Jogging (m)	2224.2 ± 2,544	2328.4 ± 203.3*
Medium-speed (m)	1215.1 ± 162.7	1314.7 ± 138.8*
High-speed (m)	455.9 ± 66	515.2 ± 77.6*
Sprinting (m)	198.5 ± 57.2	220.9 ± 62.3

*p<0.05

Numbers of short passes and feints were significantly greater in ROR matches, but numbers of offside and long passes were significantly greater in OR matches (Table 3).

Table 3. Match parameters (mean±SD).

	OR (n=15)	ROR (n=15)
Short passes	398.1± 57.2	425.9 ± 62.8*
Long passes	72.2 ± 21.8	59.8 ± 10.1*
Feints	85.1± 15.8	97.9 ± 13*
Shots	19.9±5.5	21.5 ± 6.3
Offsides	9.7 ± 3.6	7.73 ± 3.2*
Tackles	104.4 ±41.6	115.5 ± 39.5
Goal position	17.1± 5.3	17.5 ± 5.7

*p<0.05

The number of steps taken by assistant referees was significantly lower in ROR matches, but the number of steps taken by referees in ROR and OR matches was not significantly different (Table 4).

Table 4. Number of steps taken by the referees (mean±SD).

	OR (n=15)	ROR (n=15)
Referee	8.176 ± 1307	8.921 ± 963
Assistant referee 1	6.144 ± 543	4.330 ± 250*
Assistant referee 2	6.161 ± 358	4.188 ± 336*

*p<0.05

Mean active playing time in OR and ROR matches was not significantly different. (50±4 min vs. 52±3 min, respectively).

DISCUSSION

In the present study, the effects of using two different offside rules protocols in matches was investigated by looking at team performance, variables. The total distance covered in the matches played with the ROR was significantly greater than in matches played with the OR. Significant differences were also found in distances run at all running speeds except sprinting when using the revised and standard offside rules. Similar to our study, for the same age groups, Da Silva et al. (2007) reported the average distance covered by each player as 8,638 m. In a study of U-18 players, Aslan, et al. (2012) found a greater total distance covered 9,900 m. (5,146 m for the 1st half and 4,754 m for the 2nd half) than we did, but the players were allowed 3-minute resting periods for blood lactate sampling. These rest periods may have contributed to the greater distance covered by their participants.

To date, no studies have been published which compare match characteristics and distance covered by players in matches played under different offside rule protocols. One factor which influences the quality of a soccer match is the distance covered while running at high-speed or sprinting (Mohr et al., 2003). Although distance covered while sprinting was not significantly different between the OR and ROR matches, significant differences were seen in other areas which affected the overall qualities of the games. In games using the ROR, the increase in distance covered, may be explained by the larger area of the active playing field, which means the defence has to cover a larger area. In this case, offence has a larger from which to attack - this can increase the tempo of the game. The distances covered with high-speed running could be explained by the availability of this extra active playing space to players.

The number of the short passes was significantly greater in ROR matches. One result of increasing the size of the active playing field is to increase the number of short passes. Upon a larger active playing field, players may have more time to observe and strategize when they have the ball. These factors may have resulted in the greater number of short passes. Interestingly, the number of long passes was lower in ROR matches. The greater number of short passes may have reduced the requirement for long passes. The number of feints was significantly greater in ROR matches. Due to larger active playing field, the urge of players to carry the ball to empty area of the field may have increased, thus the increased number of feints. The number of offside violations was substantially lower in ROR matches, possibly due to the smaller size of the offside area. This is an important result, which can result in fewer interruptions when attacking and could increase both active playing time of the ball and spectator satisfaction.

While there was no significant difference in terms of the number of the steps taken by the main referees during OR and ROR matches, the number of the steps taken by assistant referees was significantly lower in ROR matches. The measurement of steps taken during running, via a pedometer, is considered a valid calculation method (Rowlands et al., 2007). The number of steps taken by the main referees was greater, but not significantly so, in ROR matches. A top class referee travels 11-13 km (Weston et al., 2010; Castagna et al., 2004)). The increase in the total distance covered by the players, the increase in distance covered at high running speeds, and the larger active playing field might also increase the distances needed to be covered by the referees and thereby increase their workload.

The assistant referee moves along the sideline of the pitch, with some exceptions (penalty kicks, etc.). The distance which must be covered is 50 m with OR and 35 m with ROR; the shorter distance to travel in ROR matches may result in a reduced workload for the assistant referees. An assistant referee covers 6000 m approximately during a match (Mallo et al., 2008). Correct positioning of the assistant

referee might influence decisions of the referee in situations such as offside, corner kicks, goal kicks or whether or not the ball passed the goal line. An assistant referee who is less worn out may provide more accurate and consistent assistance to the main referee.

Revised Offside Rule (52.1 minutes) and OR (50.5 minutes) matches did not differ significantly in terms of active playtime. The almost 2-minute difference, although not statistically significant, is very important and may result in increased ball possession by the players, numbers of short passes, tackles, feints and the lower number of offside penalties.

The present study has some limitations. We studied amateur, rather than professional, teams in non-tournament matches. A friendly tournament may not be sufficient to demonstrate behaviour under actual match conditions. We did not collect position-specific data. Defence, middle field and attacking players could be assessed separately in future studies.

Using a revised offside rule, the effective playing area of the soccer field is enlarged. The games using this rule had more short passes and fewer offside penalties. Assistant referees took significantly fewer steps in ROR matches. Games played with ROR implemented may be less congested and more dynamic, thus increasing spectator satisfaction.

In case of changing the offside rule, tactical parameters and physiologic demands of players will differ prominently. Coaches will need novel tactical variations and strategies. In this process, some difficulties and adaptation problems may appear for all stakeholders of soccer.

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