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The Effect of Soccer Players' Positional Role in Iran Super League on Sport Injury Rates

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Abstract: The risk of injury in soccer is considerable. The purpose of this study was to evaluate the effect of soccer players' positional role in Iranian premier league on sport injury rates. Videotapes of 125 out of 240 matches of Iranian soccer premier league during the 2006-07 seasons were selected and analyzed by video analysis system and injury information and positional roles of injured players were recorded. 306 injuries occurred in these 125 matches. Midfielders were the most frequently injured players ($P<0.05$); than others. Strikers (88.1) and midfielders (72.65) were more prone to injuries in the offensive phase, whereas defenders (86.15) and goalkeepers (91.8) were more susceptible when defending. Most injury mechanisms were classified as being contact (86.1%). The results showed that the most frequent injuries, mechanism of injury and anatomical location of an injury were different in different positions. This information helps players, coaches and physicians to plan preventive and treatment programs.

Key words: Soccer % Iranian Premier League % Injury % Positional Role

INTRODUCTION

Previous researches show that the prevalence and risk of injury in soccer is high. Researchers reported more injuries in soccer than other field sports [1]. The injury rate among male soccer players is about 10 to 35 injuries per 1000 hours of competition [2]. It means that each male elite soccer player annually faces a performance-limiting injury [3]. A research in United Kingdom Soccer Confederation showed that each injury averagely leads to four absences from competitions and every week, about 10% of team members are not able to practice due to their injuries. This research also showed that about 125 million euro (averagely 1.4 million euro each team) in (1999-2000) season in United Kingdom Soccer League (92 clubs) was lost due to the absence resulted from their players' injuries [4]; therefore, these injuries should be controlled to increase soccer players' immunity and health. Firstly, the variables leading to injuries should be recognized. Then, effective procedures to prevent injuries should be presented. Researches show that factors such as inappropriate posture [5], weather condition [6], field condition [7], inappropriate sneakers [8], inappropriate warm-up, the level of physical fitness, muscular contracture [9] and previous injury [10] lead to the players' injury [11, 12]. However, there are few researches on the effect of the players' positional role on the rate and manner of injury incident.

Previous researches support the hypothesis that soccer players' positional role affects their injury rate [12-16, 2], but there are controversies about which positional role is injured most. For example, Morgan *et al*. [14] investigated the players of U.S.A. super league and concluded that halfbacks (37.6%) and defenders (29.6%) were injured more than other positional roles. McGregor *et al*. [15] knows halfbacks (39%) as vulnerable to more injuries as well, while Hawkins and Fuller [17] believe that defenders are more vulnerable to injuries. Sergi [12] investigated the players of Serbia League and concluded that goalkeepers are more vulnerable to injuries. Anderson *et al.* [2] state that strikers and midfielders are more vulnerable to injuries when attacking and defenders and goalkeepers when defending. Deehan *et al*. [16] reported that halfbacks are more vulnerable to musculoskeletal injuries [16]. Woods *et al.* [8] and Price *et al*. [13] believe that halfbacks and defenders were injured the most.

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As responsibilities, activities [19], the intensity of physical activity, physiologic profile [20], anthropometric characteristics, muscle strength and players' flexibility [21] are different in different positional roles, it is expected that the players in different positional roles enjoy different injury patterns and rate. As there are contrary findings, the researchers have not yet come to a sound conclusion that which positional role is injured the most and there is limited information about this subject in Iran, the present research intends to investigate the effect of players' positional roles on their injury rate in Iran Soccer super league.

MATERIALS AND METHODS

As this research tried to investigate the effect of the players' positional roles on their injury rate, videotapes of 125 matches out of 240 matches of Iran soccer super league during the 2006-07 season were analyzed by one of the researchers. A computer and a video cassette recorder were used to investigate the videotapes. The videotape was paused after each injury and Intervideo WinDVR software (version 3.0) was used to examine and to zoom up different scenes. The data were gathered and registered in special sheets. It should be mentioned that these sheets were provided based on Fuller *et al.* [17] and Hawkins and Fuller's [22] injury forms.

This research would register each incident as an injury if the player needed medical care and if he received medical treatment in that incident [23, 24]. The number of hours the players were vulnerable to injury were determined as follows: 22 players were totally present in each match and each match was 100 minutes (45 minutes every half time and 5 minutes extra time per half time) [14, 7].

This research supposed that all the teams were arranged as 4-4-2-1, which is the most common soccer team system and there are four defenders, four halfbacks and two strikers as well as a goalkeeper [14]; therefore, the players were divided into six groups in order to precisely investigate the injury rate in different positional roles: two line defenders, two midfielders, two line fielders, two strikers, two mid defenders and a goalkeeper [24].

SPSS13 and chi-square test ($P<0.05$) were used to analyze the data.

RESULTS

Generally, 306 injuries were observed in 125 matches. It means 66.8 injuries per 1000 match hours or 2.44 injuries per match. Figure 1 shows the percent of injury rate in different positional roles. A significant difference was observed in injury rate among different positional roles ($P<0.05$ and $\div^2 = 33.19$): halfbacks were injured the most (39.54%); next, defenders (28.11%), strikers (19.61%) and goalkeepers (12.75%) respectively. After the halfbacks and defenders were divided into mid and line positional roles, it was observed that midfielders (24.51% of all injuries) were injured more than line fielders (15.03% off all injuries), but line defenders (15.36% of all injuries) were injured more than mid defenders (12.75% of all injuries) (Fig. 1).

Of course, if the injury rate per 1000 match hours is separately calculated for each positional role, goalkeepers (93.6 injuries per 1000 hours) will be vulnerable to injury more than other positional roles. Next, midfielders (90 injuries per 1000 hours), strikers (72 injuries per 1000 hours), line defenders (56.40 injuries per 1000 hours), line fielders (55.20 injuries per 1000 hours) and mid defenders (46.80 injuries per 1000 hours) were ranked respectively (Fig. 2).

The investigation of contact type leading to injury showed that line defenders, midfielders, line fielders and strikers were significantly ($P<0.05$) injured due to direct contact and mid defenders and goalkeepers were injured due to indirect contact (Table 1).

Table 1: Contact type leading to injury in different positional roles (%)

		Players' positional roles						
		Mid defender	Line defender	Midfielder	Line fielder	Goalkeeper	Striker	Total
Contact type	Direct	2.3	9.2	14.1	9.8	2.3	9.4	47.0
	Indirect	8.8	4.2	6.5	3.6	7.2	8.2	38.6
	No contact	1.6	2.0	3.9	1.6	3.3	2.0	14.4
Total		12.7	15.4	24.5	15.0	12.8	19.6	100.0

Table 2: The mechanism of injury incident in different positional roles (%)

		Players' positional roles						
		Mid defender	Line defender	Midfielder	Line fielder	Goalkeeper	Striker	Total
The mechanism of injury incident	Run	0.3	0.7	0.3	0.0	0.3		1.9
	Tackle	2.0	2.3	2.9	2.3	0.7	0.3	11.2
	Other non-contact incidents	0.3	0.7	1.6	1.0	0.0	1.0	3.9
	Being tackled	1.3	4.2	9.2	7.8	1.3	0.3	28.4
	Turn	0.3	0.3	0.0	0.0	0.3	4.6	1.2
	Contact	3.9	2.3	3.6	1.3	5.9	0.3	20.9
	Pull	0.0	0.0	0.0	0.0	0.0	3.9	0.3
	Be kicked	2.0	2.3	3.3	0.7	0.3	0.3	12.5
	Shoot	0.3	0.3	0.0	0.3	1.0	3.9	1.9
	Land	0.3	0.7	0.7	0.3	0.7	0.0	3.7
	Fall	0.3	0.0	0.3	0.7	0.3	1.0	2.9
	Dive	0.0	0.0	0.0	0.0	0.6	1.3	0.6
	Head	0.7	0.3	0.0	0.0	0.0	0.0	1.0
	Use the elbow	1.0	0.0	1.3	0.3	0.0	0.0	4.2
	Ball contact	0.0	0.7	0.3	0.0	0.0	1.6	1.0
	Push	0.0	0.7	0.3	0.0	0.0	0.7	1.7
	Contact with the goal frame	0.0	0.0	0.0	0.0	0.7	0.0	0.7
	Other incidents	0.0	0.0	0.7	0.3	0.7	0.3	1.0
Total		12.7	15.4	24.5	15.0	12.8	19.6	100.0

Table 3: Players' injured areas in different positional roles (%)

		Players' positional roles						
		Mid defender	Line defender	Midfielder	Line fielder	Goalkeeper	Striker	Total
The injured area	Head and face	5.1	2.6	4.2	1.0	1.3	2.6	16.8
	Neck	0.0	0.0	0.3	0.3	0.7	0.0	1.3
	Shoulder	0.0	0.0	0.0	0.3	0.7	0.7	1.7
	Upper extremities	0.0	0.0	0.0	0.3	0.6	0.6	1.5
	Trunk	2.6	1.7	2.9	2.3	3.3	4.2	17.0
	Groin	0.3	0.3	1.6	0.7	1.0	1.0	4.9
	Thigh	0.7	0.7	0.7	1.2	0.7	1.0	5.0
	Knee	0.7	1.6	3.3	2.0	2.3	2.3	12.2
	Calf	0.7	3.3	5.9	3.6	0.9	3.6	18.0
	Ankle	2.3	3.9	4.6	3.3	1.0	2.9	18.0
	Feet and toes	0.3	1.3	1.0	0.0	0.3	0.7	3.6
Total		12.7	15.4	24.5	15.0	12.8	19.6	100.0

The players' playing position at the time of injury showed that strikers and halfbacks were more injured when attacking and defenders and goalkeepers when defending ($P<0.05$) (Fig. 3).

The mechanism of injury incident in different positional roles showed that mid defenders were more injured due to their contact with other players, line defenders, midfielders and line fielders due to being tackled, strikers due to being kicked and goalkeepers due to their contact with other players (Table 2).

The investigation of injured anatomical areas showed that calf (18.6%) was vulnerable to injury more than other areas. Table 3 shows that mid defenders more injured their heads and faces, line defenders their ankles, midfielders and line fielders their calves and strikers and goalkeepers their trunks.

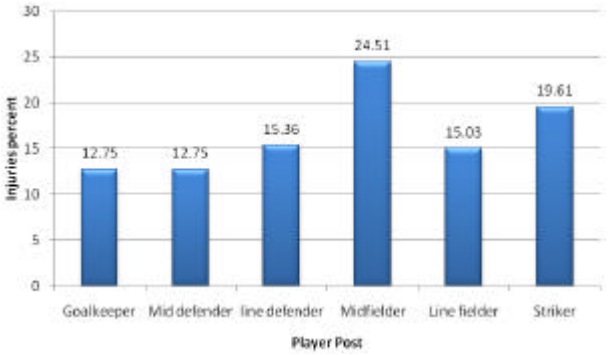

Fig. 1: The percentage of injury rate in each positional role

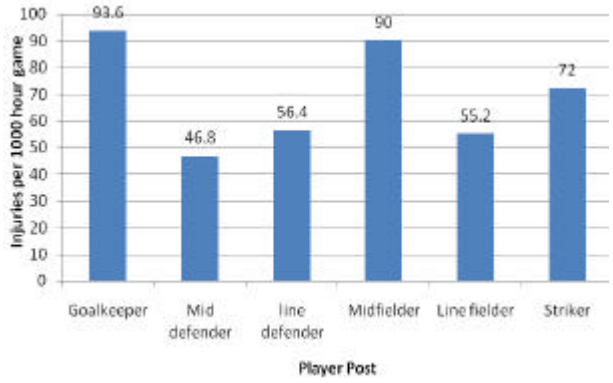

Fig. 2: Injury rate per 1000 hours in each positional role

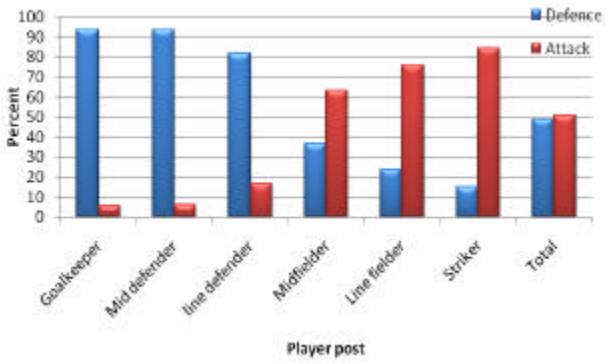

Fig. 3: Injury rate in each positional role when attacking or defending

DISCUSSION AND CONCLUSION

The aim of the present research was to investigate the effect of Iran super league soccer players' positional roles on their injury rate. The results showed that in Iran soccer super league, midfielders were vulnerable to injury more than other positional roles (24.51%). McGregor and Rae [15], Morgan *et al.* [14], Woods *et al.* [18], Price *et al.* [13], Deehan *et al.* [16] and Anderson *et al.* [2] reported the same results.

More injuries in midfielders may be attributed to their intensive activity in the soccer field during the soccer match [16], their higher contact in the middle of the soccer field to catch the ball [2] and more injury incidents in the middle area of the soccer field [2]. Salvo *et al.* [19] stated that halfbacks covered more distance than defenders and strikers which may result in more injuries in these players. Several researchers state that there is no relationship between the players' positional role and injury incidents [11]. Anderson *et al.* [24], Sergi [2], Hawkins *et al.* [4] and Hawkins and Fuller [17] reported contrary results. The reason may be various playing styles and methods in different countries as well as the players' various playing levels [24]; therefore, we can conclude that halfbacks are more vulnerable to injury than other players and as a consequence, this point should be taken into account when planning training schedules. Halfbacks were more injured due to being tackled; therefore, this point as well should be taken into consideration.

Except for a goalkeeper, there are two players simultaneously for each positional role in the soccer field; therefore, we should determine the injury rate per 1000 hours for each player in each positional role to compare the injury rate among various positional roles. If we use this index to compare the injuries among various positional roles, it can be observed that goalkeepers were injured more than other players (93.6 injuries per 1000 hours). Using the same index, Sergi [12] reported the same results. The high rate of injury in goalkeepers may be as follows: they use their upper extremities in addition to their lower extremities; therefore, this point leads to more injury. Goalkeepers' especial responsibilities and activities such as diving as well lead to the high rate of injury. The results of the present research showed that strikers and halfbacks are more injured when attacking and defenders and goalkeepers when defending. Anderson *et al.* [24] reported the same results. This above result may be in consequence of the players' responsibilities in various positional roles; defenders and goalkeepers are more responsible to defend and avoid a goal while strikers and halfbacks are more responsible to strike and score a goal; therefore, defenders and goalkeepers are more injured when defending and strikers and halfbacks when attacking.

The results show that the mechanism of injury is different in various positional roles as mid defenders and goalkeepers are more injured due to contact with other players, line defenders, midfielders and line fielders due to being tackled and strikers due to being kicked. The difference in injury rate among various positional roles can be attributed to the players' various responsibilities and their positional location in the soccer field. For

example, defenders and line fielders trend to move speedily from border of field; therefore, they are more prone to opponents' tackles and are more injured. We can use this information to plan training schedules and to avoid injuries in various positional roles.

The present results show that lower extremities are more vulnerable to injury than other parts of the body. Researchers report the same results as well [4, 13]. This point may be due to more contact of the lower extremities when running, shooting and jumping during soccer match [23]. Goalkeepers more injured their upper extremities and trunk. Sergi [11] and Dvorak *et al*. [12] reported the same results as well. Goalkeepers injure their trunk and upper extremities due to the fact that they have different responsibilities and they can use their hands during a soccer match [12].

The results of the present research provide useful information about different injury rates, anatomical areas vulnerable to injury and the mechanism of injury rate in different positional roles. Sport medical professionals, coaches, sport physicians, team examiners and players can use this information to avoid soccer injuries.

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