

[Primary Care]

Incidence, Nature, and Pattern of Injuries to Referees in a Premier Football (Soccer) League: A Prospective Study

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Background: Despite the crucial role of referees in a soccer match, few researchers have targeted the injury profile of referees in their studies. Understanding the incidence, nature, and pattern of injuries could provide important information for educational and preventative efforts at the international level.

Hypothesis: The incidence rate and patterns of acute injuries to official referees of the Iranian Premier Football League during the 2009-2010 season are similar to those reported among referees in short-term international competitions such as FIFA World Cup.

Study Design: Prospective cohort study.

Methods: Demographic data for 74 referees, including 30 main referees and 44 assistant referees, were collected at the beginning of the season. To record injuries and refereeing time, weekly contact was made by a physician.

Results: In total, 102 injuries were reported by referees during the football season. The incidence rates of injuries among referees during training and matches were 4.6 and 19.6 injuries per 1000 hours, respectively. Muscular and tendon injuries were found to be the most common type of injury, and the most common site of injury was the lower leg followed by the hip and groin.

Conclusion: The results of this study are consistent with similar prospective studies evaluating injuries to referees over the course of a short-term tournament.

Clinical Relevance: These findings provide a base for suggesting possible preventive recommendations in future studies.

Keywords: football (soccer); main referee; assistant referee; injury

Football (soccer) is the most popular sport internationally and has a relatively high risk of injury.^{8,10,11-13} The referee, as the 23rd player, is under considerable psychological and physical pressure during a football match, which may lead to injuries. Despite the referee's crucial role in the match, few researchers have targeted the injury profile of the referee in their studies. Much of the existing scientific literature on referees has focused on the physiologic aspects of their activities during competitions.^{6,16}

METHODS

This study was approved by the Ethics Committee of the Tehran University of Medical Sciences. A prospective design was

employed in this study. All 75 referees (30 main referees [MRs] and 45 assistant referees [ARs]) selected to officiate in the 2009-2010 season of the Iranian Premier Football League participated in the study. By agreement with the referee committee of the Iranian Football Federation, at the beginning of the study, all 75 referees attending the preseason camps were interviewed, and the demographic data collected included age, body mass index, years of officiating in the premier football league, and the mean time spent training per week. All referees participated in the study voluntarily, and informed consent was obtained. One referee withdrew from the study because of personal issues. Therefore, 74 referees were followed for approximately 10 months. In this period, all injuries sustained by the subjects

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Table 1. Characteristics of referees

Variable	MRs (n = 30), Mean ± SD	ARs (n = 44), Mean ± SD
Age, y	37.30 ± 3.20	36.30 ± 4.30
Height, cm	181.00 ± 5.57	176.00 ± 5.02
Weight, kg	78.00 ± 7.20	72.00 ± 7.10
Body mass index, kg/m ²	23.68 ± 1.28	23.20 ± 1.99
Issuance of first national official referee license, y	15.06 ± 3.24	15.00 ± 4.23
Years officiating in the national premier league	5.20 ± 2.40	4.80 ± 2.95
Training hours before start of the season, per week	8.04 ± 2.69	6.87 ± 2.07
Training hours during the season, per week	6.29 ± 2.34	5.00 ± 1.59

ARs, assistant referees; MRs, main referees; SD, standard deviation.

during matches and training sessions were recorded. Match and training exposure times were also recorded. Exposure times were obtained using the exposure report form. The referees' exposures were categorized into 2 time spans: (1) training period and (2) premier league matches. During the season, regular weekly face-to-face or telephone contacts were made with all referees by 2 physicians to record any injuries and complaints. Whenever a referee reported an injury, he was interviewed by a sports medicine physician, and a standard form was filled out for each injury to record injury characteristics, including site and severity of the injury and symptoms.¹⁵ To limit injury underreporting resulting from negligence or fear of damaging their reputation, the impact of the study on the prospective job safety of the referees was explained to the subjects during the orientation session.

In this study, both the definition of injury and the procedure of recording injuries were compliant with the International Consensus Statement for the Epidemiological Studies of Injuries in Football.⁹ In this regard, injury was defined as "any physical complaint sustained by a referee that results from a football match or career-related training sessions irrespective of the need for medical attention or time loss from football activities."

The incidence of injury was indicated as the number of injuries per 1000 hours of career-related activity per referee. Differences between injury incidences were considered significant when the *P* value was less than 0.05. Data were analyzed using STATA software (version 8; StataCorp LP, College Station, Texas).

RESULTS

Seventy-four referees were followed for the entire season (Table 1). In total, 102 acute injuries were recorded, of which 46 were incurred by MRs and 56 sustained by ARs. The incidence rate of injuries was 5.75 per 1000 hours of referee

exposure, with an MR injury rate of 5.74 and AR rate of 5.76 (see Appendix A, available at <http://sph.sagepub.com/content/suppl>). The incidence rate of injury to MRs during matches is approximately 2.5 times greater than that for ARs (*P* = 0.01). However, comparing the incidence rate of injuries during training sessions, no significant difference was found between MRs and ARs (*P* = 0.40).

Moderate injuries led to 8 to 28 days' absence of the referees from training sessions or matches (see Appendix B, available at <http://sph.sagepub.com/content/suppl>). Injuries that led to less than 7 days or more than 28 days of absence were categorized as mild and severe, respectively. Most injuries sustained were classified as moderate. Ankle sprain (n = 13) followed by calf spasm (n = 11) and groin strain (n = 10) were the most common acute injuries among referees. Muscular and tendon injuries were the most common type of acute injuries among MRs and ARs. The most common site for injuries was the lower leg (Table 2).

Injuries led to 71 weeks of absence from the training sessions for MRs and 106 weeks of absence for ARs. Accordingly, MRs and ARs missed officiating in 10 and 18 matches, respectively, as a result of their injuries.

DISCUSSION

The incidence rate of injuries to MRs obtained in this study is consistent with that reported from the prospective portion of the 2006 FIFA World Cup study and somewhat comparable with the prospective report of 2007 FIFA Women's World Cup research (see Appendix C, available at <http://sph.sagepub.com/content/suppl>).^{2-5,14} The similarity of these results shows that the incidence of injury is minimally influenced by the level of play. Recently, Bizzini et al investigated the incidence rate, patterns, and characteristics of acute- and gradual-onset injuries of referees in both national³ and international^{2,5}

Table 2. Number (%) of acute injuries sustained in each location

	MRs	ARs
Head and neck		
Head/face	1 (2.17)	1 (1.78)
Neck/cervical spine	—	—
Upper limbs		
Shoulder/clavicle	—	1 (1.78)
Upper arm	—	—
Elbow	1 (2.17)	—
Forearm	—	—
Wrist	—	1 (1.78)
Hand/finger/thumb	2 (4.70)	1 (1.78)
Trunk		
Sternum/wrist/upper back	—	1 (1.78)
Abdomen	—	—
Lower back/pelvis/sacrum	3 (6.51)	2 (3.56)
Lower limbs		
Hip/groin	6 (13.02)	9 (16.00)
Thigh	7 (15.19)	7 (12.46)
Knee	3 (6.51)	9 (16.00)
Lower leg/Achilles tendon	12 (26.04)	12 (21.36)
Ankle	7 (15.19)	6 (10.68)
Foot/toe	4 (8.68)	6 (10.68)
Total	46 (100.00)	56 (100.00)

ARs, assistant referees; MRs, main referees. Long dashes represent that there were no injuries.

competitions and among amateur⁴ and elite^{3,5} referees. These studies indicated an incidence rate of 0.7 to 34.7 per 1000 match hours. Accordingly, the mean incidence rate of injuries in training was 0.09 injuries per 1000 training hours among Swiss referees officiating at all levels of play.⁴

Recall bias is considerably more prominent in retrospective studies,⁷ which is probably why the incidence rates from retrospective studies are not in agreement with these. The results revealed a considerably lower incidence of injury among ARs during matches in the 2006 FIFA World Cup. The referees selected for officiating in the 2006 FIFA World Cup were significantly older than the subjects in this study (41.0 ± 3.7 vs 36.7 ± 4.0 years). Arnason et al¹ reported a

positive correlation between age and incidence of injury among football players. Although the association between age and rate of injury is still under discussion, the younger age of the referees who participated in our study might have played a role in the lower rate of injuries.

As a limitation of this study, referees with a wide range of ages, body mass indices, and years of experience in officiating football matches were recruited. This might limit the comparison of our results with data collected from international tournaments (which include older and more experienced referees) and amateur competitions (with younger and less experienced referees). Another limitation was that the authors could not assess the impact of injuries on the performance of the referees.

CONCLUSION

The results of this study show that muscle and tendon injuries of lower limbs are the most common injuries among referees. There was a higher rate of injury among referees during matches compared with training sessions.

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