Propensity for osteoarthritis and lower limb joint pain in retired professional soccer players

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Abstract

***Objective*—To quantify the prevalence of osteoarthritis and the severity of pain in the lower limb joints of players retired from English professional soccer.**

***Method*—An anonymous self administered questionnaire was distributed to 500 former players registered with the English Professional Footballers' Association. The questionnaire was designed to gather information on personal details, physical activity loading patterns, history of lower limb joint injury, and current medical condition of the lower limb joints.**

***Results*—Of 500 questionnaires distributed, 185 (37%) were returned. Nearly half of the respondents (79: 47%) retired because of injury; 42% (33) were acute injuries and 58% (46) chronic injuries. Most of the acute injuries that led to early retirement were of the knee (15: 46%), followed by the ankle (7: 21%) and lower back (5: 15%). Most of the chronic injuries that led to early retirement were also of the knee (17: 37%), followed by the lower back (10: 22%) and the hip (4: 9%). Of all respondents, 32% (59) had been medically diagnosed with osteoarthritis in at least one of the lower limb joints. More respondents had been diagnosed with osteoarthritis in the knee joints than either the ankle or the hip joints. Significantly ($p<0.001$) more respondents reported pain in one lower extremity joint during one or more daily activities than those who did not (joint pain: 137, 80%; no joint pain: 35, 20%).**

***Conclusion*—The risk for professional soccer players of osteoarthritis in at least one of the lower extremity joints is very high and significantly greater than for the general population. The results support the suggestion that professional soccer players should be provided with health surveillance during their playing career.**

(*Br J Sports Med* 2001;**35**:402–408)

Keywords: soccer; osteoarthritis; joint pain; health surveillance

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Accepted 23 July 2001

There is a general requirement under legislation in the United Kingdom for employers to protect employees from any risks to their health and safety.[1] Of particular importance is the specific requirement for employers to provide health surveillance to employees where significant risks to their health have been identified.[2] The key elements in determining if health surveillance is required are whether an identifiable adverse health condition that is directly related to the work exists and whether there is a reasonable likelihood that the effect may occur under the conditions of the work.

It has been reported that about 2% of English professional soccer players retire each year as a consequence of an acute injury.[3] Although this figure is high compared with most other occupations, it is relatively low considering the high injury levels (8.5/1000 player hours of exposure) reported for professional soccer.[4] It has been suggested, however, that a significant proportion of players also leave the profession because of chronic injuries that result from repeated minor acute injuries.[2]

The major chronic injury suffered by professional soccer players has been reported[5] to be osteoarthritis (OA). Compared with control groups, a higher prevalence of OA has been reported for former amateur and professional soccer players in the ankle,[6 7] knee,[8–11] and hip[12–14] joints. Despite this evidence, the UK Industrial Injuries Advisory Council (IIAC)[15] dismissed calls for OA of the knee resulting from participation in professional soccer to be included in the Industrial Injuries Scheme under the Contributions and Benefits Act (1992). Osteoarthritis of the hip resulting from participation in professional sport is currently under consideration by the IIAC for inclusion as an industrial injury, but, until stronger evidence has been published, it is unlikely that this condition will be included either.

To demonstrate the importance of introducing control procedures and health surveillance for the reduction of chronic injuries among professional soccer players, it is important to show clearly that a career as a professional soccer player can lead to long term medical consequences and that the risks are higher than in a normal control population. The specific objectives of this study were therefore to quantify the prevalence of OA and the level of pain sustained in the lower limb joints of retired English professional soccer players. This investigation forms part of a wide ranging risk management programme aimed at improving the health and safety of professional soccer players.[1]

Method

The method adopted for data collection was an anonymous self administered postal questionnaire based on established published knowledge and criteria for assessing the causes, presence, and severity of OA.

QUESTIONNAIRE CONTENT

The questionnaire consisted of four broad sections designed to accrue information on

personal details, physical activity loading patterns, history of lower limb joint injury, and current medical condition of lower limb joints. Each of these sections within the questionnaire was divided into a number of subsections.

Personal details

Respondents were asked to provide the dates at which the following events occurred: birth, first official schoolboy game, first professional contract, and retirement from professional soccer. Details were also recorded for the highest playing levels achieved and major playing position (goalkeeper, defender, midfielder, forward). Players were requested to identify the main reason for their retirement from professional soccer.

Physical activity loading patterns

Lifetime physical activity records, which have been used previously[14 16 17] to assess the contribution of physical activity exposure to the incidence of OA, were recorded. Players were requested to identify the typical number of hours a week that they trained during the three stages of their soccer career (schoolboy player, professional player, and after retirement). They were also requested to provide information on the type of training undertaken at each of these stages in their career. Training was classified as endurance (for example, continuous running), power (for example, weight training), and football specific activities (for example, sprinting, five a side, turning, and twisting).[14 16 17]

History of lower limb joint injury

Players were asked to identify the number of moderate and major injuries received as a consequence of playing professional soccer to the lower limb joints (hip, knee, and ankle). The injury severity definitions of "moderate" (absent from training/competition for one week to one month) and "major" (absent from training/competition for more than one month) were the same as those used previously to categorise acute injuries in professional soccer.[4] Data were also obtained on age at the time of surgery and when a medical specialist first officially diagnosed OA for each joint.

Current medical condition of the lower limb joints

This section requested information on current joint function and level of joint pain during a range of static (sleeping, rising from bed, sitting, standing) and dynamic (walking up/down stairs, walking over 1 km, and squatting/bending forward) daily activities. Kujala *et al*,[14 16] Raty *et al*,[17] and Lequesne and Samson[18] used this range of activities previously in studies of OA, and Lequesne and Samson[18] used and validated the intensity of pain scale (nil, minor, moderate, severe, and very severe) previously in a study of OA.

IMPLEMENTATION OF THE SURVEY

The survey was distributed to 500 former professional soccer players registered with the English Professional Footballers' Association (PFA). It was accompanied by a supporting letter of explanation, signed by the Chief Executive of the PFA, and a prepaid reply envelope.

DATA ANALYSIS

All statistical analyses were carried out using the Statistical Package for the Social Sciences version 9.0 (SPSS Inc, Chicago, Illinois, USA) for Windows computer package. Statistical significance was accepted at the $p<0.05$ level, unless stated otherwise. Where appropriate, values are reported as a mean (SD) (range).

Categorical data were assessed by a cross tabulation method using exact χ^2 tests. For all ratio data, analysis of variance for independent samples was used when the Levene test for homogeneity of variance was not significant. If the test for homogeneity of variance was significant, and the largest variance in each group did not correspond to the largest number of variables per group, Kruskal-Wallis *H* tests for three or more unrelated groups were used. A post hoc Tukey test was used to identify specific differences for all parametric tests.

Diagnosed arthritis rates (DARs), which were calculated for each of the lower limb joints, were standardised to an exposure time of 100 000 competition/training hours. The DARs were based on exposure to soccer related activities from a player's first schoolboy match to the age at which OA was diagnosed in each lower limb joint. Exposure times during competition were calculated from the typical number of competition games played per season for youth players[4 19–21] and professional players.[4 19 20 22] Exposure times during training were calculated for each career stage using the values provided by each respondent. Values of DAR were calculated using the following formulae:

Total diagnosed arthritis rate (DAR_T) = (Number of respondents diagnosed with OA in at least one joint/total exposure time for all respondents) × 100 000

Diagnosed arthritis rate (DAR_J) for a specified joint J = (Number of respondents diagnosed with OA in joint J/total exposure time for all respondents) × 100 000

A weighted average pain score was calculated for each joint based on the level of pain reported (nil, 0; minor, 1; moderate, 2; severe, 3; very severe, 4) and the number of respondents reporting each level of pain.

Results

RESPONSE RATE

Of the 500 questionnaires distributed to former professional footballers, 185 (37%) were returned.

PERSONAL DETAILS

The mean age of the respondents was 47.6 (13.2) (20–84) years. The mean age at which the respondents reached the specified playing milestones were: first competitive schoolboy game, 10.4 (2.4) (4–16) years; signed first professional contract, 18.2 (2.4) (16–27) years; retired from playing professional soccer, 32.5 (5.2) (17–42) years. Respondents played, on

Table 1 Average levels of activity as a function of career stage and type of training

	Type of training (hours/week)		
Career stage	*Football specific*	*Endurance*	*Power*
Schoolboy	4.8 (4.9)	1.6 (3.0)	0.3 (0.8)
Professional	8.1 (4.0)	3.3 (2.6)	1.5 (1.2)
Retired	3.5 (2.1)	1.1 (1.6)	0.8 (1.5)

Values are mean (SD).

average, for 4.1 (2.0) professional clubs during their soccer career. For those respondents who identified a preference, 71% (127) were right foot dominant, 21% (37) were left foot dominant, and 9% (16) were ambidextrous. There were significant differences in the distribution of players as a function of the highest level of achievement (International, 64 (36%); Premier League (and old First Division), 73 (41%); First Division (and old Second Division), 21 (12%); Second Division (and old Third Division), 10 (6%); Third Division (and old Fourth Division), 10 (6%); $p<0.001$). There were significant differences ($p<0.001$) in the numbers of respondents by playing position (goalkeeper, 12 (7%); defender, 51 (28%); midfielder, 58 (32%); forward, 59 (33%); $p<0.001$). However, there was no significant difference between the expected numbers of respondents in each playing position based on a standard 1:4:4:2 team playing formation.

Of those respondents expressing a reason, nearly half reported that they had retired from soccer because of injury (79: 47%), 33 (42%) because of an acute injury and 46 (58%) because of a chronic injury.

PHYSICAL ACTIVITY LOADING PATTERNS

Table 1 shows mean weekly exposures to training as a function of career stage and type of training. There were significant ($p<0.001$) differences in exposure for endurance, power, and football specific training, with the average exposures for all types of training being significantly ($p<0.001$) greater during the professional career stage than for the schoolboy and retired career stages.

HISTORY OF LOWER LIMB JOINT INJURY

Figure 1 shows the location and nature of the 33 career ending acute injuries, for which there were significant differences, as a function of both injury nature and injury location ($p<0.01$). The knee was the location of most of the career ending acute injuries (15: 46%) followed by the ankle (7: 21%), lower back (5: 15%), and lower leg (4: 12%). Damage to ligament structures (12: 36%), bones through

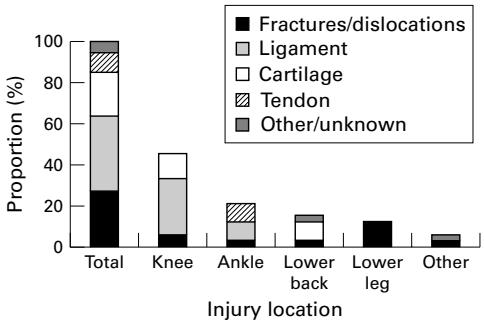

Figure 1 Location and nature of career ending acute injuries.

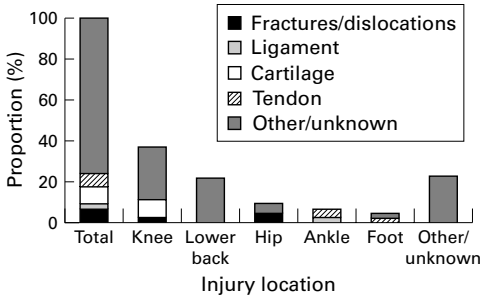

Figure 2 Location and nature of career ending chronic injuries.

fractures and dislocations (9: 27%), and cartilage (7: 21%) accounted for most of the acute injuries as a function of injury nature.

Figure 2 shows the location and nature of the 46 career ending chronic injuries. There was a significant difference in the number of injuries as a function of injury location (knee, 17 (37%); lower back, 10 (22%); hip, 4 (9%); ankle, 3 (7%); $p<0.001$) but not for injury nature (cartilage, 4 (9%); bone, 3 (7%); tendon, 3 (7%)). However, many of the respondents (35: 76%) were unable to identify the exact nature of their chronic injury.

Table 2 provides a summary of the injury history of the respondents. Significantly more respondents had received moderate ($p<0.001$) and major ($p<0.001$) injuries to the ankle and knee joints than to the hip joints. The numbers of moderate injuries to the ankles were also significantly greater than the numbers of moderate injuries to the knees ($p<0.01$).

There were no significant differences in age, as a function of joint location, at first surgical treatment and initial OA diagnosis. However, there was a significant difference ($p<0.001$) in the proportion of respondents who had received surgery as a function of joint location, with respondents more likely to have received

Table 2 History of injuries to the lower extremities

	Right hip	*Left hip*	*Right knee*	*Left knee*	*Right ankle*	*Left ankle*
% respondents receiving moderate injury	6.9	5.2	43.7	35.6	48.3	44.3
Average number of moderate injuries per player	0.1 (0.3)	0.1 (0.5)	1.2 (2.7)	1.0 (2.6)	2.3 (4.2)	2.0 (3.8)
% respondents receiving major injury	2.9	3.4	42.5	34.5	32.2	24.1
Average number of major injuries per player	0.1 (0.6)	0.1 (0.7)	0.8 (1.4)	0.6 (1.1)	0.5 (0.9)	0.4 (1.1)
% respondents receiving surgery	2.9	3.4	34.5	31.6	17.8	12.1
Average age at which surgery occurred	38.4 (21.4)	36.6 (19.5)	27.8 (7.2)	28.1 (6.5)	25.4 (6.5)	27.4 (5.7)
% respondents diagnosed with OA	1.7	4.0	19.0	21.3	5.7	6.3
Average age at which OA was diagnosed	43.7 (28.0)	42.4 (17.0)	36.1 (12.8)	35.2 (11.5)	29.5 (4.2)	31.6 (5.8)

Values are mean (SD).
OA, Osteoarthritis.

Table 3 Diagnosed arthritis rate (DAR) as a function of joint location

Joint	*DAR (100 000 hours)*
Left hip	0.3
Right hip	0.1
Either hip	0.3
Left knee	1.5
Right knee	1.3
Either knee	2.0
Left ankle	0.6
Right ankle	0.5
Either ankle	0.6
Any joint (DAR_T)	2.2

surgery to the knee joints than either the ankle or hip joints.

Of all the respondents, 59 (32%) had been medically diagnosed with OA in at least one of the lower limb joints. Some 51% of players who reported that they had retired through a soccer related injury (71) were diagnosed with OA compared with 25% of players who did not retire through injury (92). There was a significant difference ($p<0.001$) in the numbers of respondents who had been medically diagnosed with OA as a function of joint types, with more respondents diagnosed with OA in knee joints than in ankle or hip joints. Eight respondents were diagnosed with OA in two different types of lower limb joint and two respondents were affected at all three types of lower limb joint. Of those respondents who identified their age, a non-significant greater proportion of the 70+ age group were diagnosed with OA compared with the other age categories (20–29 years, 0 (0%); 30–39 years, 14 (36%); 40–49 years, 21 (35%); 50–59 years, 9 (32%); 60–69 years, 8 (42%); ⩾70 years, 6 (50%)).

Table 3 shows the calculated DAR for each of the lower limb joints (hips, 0.3/100 000 hours; knees, 2.0/100 000 hours; ankles, 0.6/100 000 hours) based on the loading rates reported for training and competition.

CURRENT MEDICAL CONDITION OF THE LOWER LIMB JOINTS

Table 4 gives the proportions of respondents with joint pain as a function of joint, activity, and whether or not the respondent had been medically diagnosed with OA.

Table 5 Weighted joint pain scores for lower limb joints as a function of static and dynamic activities

	DAR value (100 000 hours)	
Joint	*Static activities*	*Dynamic activities*
Hips	0.06	0.09
Knees	0.13	0.34
Ankles	0.06	0.11

DAR, Diagnosed arthritis rate.

Significantly more respondents reported joint pain in at least one lower extremity joint during one or more daily activities than those who did not (joint pain, 137 (80%); no joint pain, 35 (20%); $p<0.001$). There were significant differences ($p<0.01$) in the numbers of respondents who reported at least a minor level of pain in daily activities, with more respondents reporting pain in the knee joints than in the ankle and hip joints, for both static and dynamic activities. Table 5 gives the weighted pain scores calculated for static and dynamic activities for each joint and all respondents.

Discussion

The response rate (37%) for the survey was comparable with those obtained from earlier postal surveys with English soccer clubs involving physiotherapists[23] (40%), players[24] (38%), and safety officers[25] (40%). It was also comparable to employee response rates for postal surveys in other small and medium sized business studies.[26] However, it should be noted that ex-players who had specifically suffered from OA and/or lower limb joint pain after their career may have been more likely to respond to the questionnaire.

The major locations identified for career ending acute injuries were similar to those reported previously in English professional soccer by Windsor Insurance Brokers[3] for the 1987/1988 to 1994/1995 seasons (knee, 49%; back, 17%; ankle, 13%). However, the present study indicated that ankle injuries were a bigger problem than that identified previously. A prospective injury audit within English professional soccer reported that the ankle (17%) and knee (14%) accounted for most non-career-ending injuries.[4] The proportion of non-career-ending back injuries (7%) reported in this study[4] represented a relatively small

Table 4 Proportion (%) of respondents reporting lower limb joint pain as a function of static and dynamic activities

		Static activities				*Dynamic activities*		
	Any daily activity	*Sleeping*	*Getting up*	*Sitting*	*Standing*	*Climbing stairs*	*Walking >1 km*	*Squatting*
Hip joints								
All	7.5	3.7	4.0	4.9	3.8	4.9	5.2	6.7
OA	1.5	0.6	0.6	0.3	0.9	1.2	1.2	1.2
Non-OA	6.1	3.1	3.4	4.6	2.9	3.8	4.0	5.5
Knee joints								
All	36.5	5.8	13.1	12.2	12.8	17.7	16.8	30.8
OA	16.8	4.6	7.8	8.1	7.6	10.7	11.0	14.8
Non-OA	19.7	1.2	5.3	4.1	5.2	7.0	5.8	15.9
Ankle joints								
All	17.2	1.2	6.4	3.8	6.4	7.9	9.0	7.9
OA	2.6	0.3	1.5	0.6	1.7	1.2	1.8	1.2
Non-OA	14.6	0.9	4.9	3.2	4.7	6.7	7.3	6.7

OA, Osteoarthritis.

proportion of the acute injuries observed in English professional soccer compared with its significance as a career ending chronic injury.

The observation by Fuller and Hawkins[2] that a considerable proportion of players leave professional soccer because of chronic injury is supported by the result (27%) obtained in our study. The major locations identified for these career ending chronic injuries were the knee (37%), lower back (22%), and hip (9%). The high level of chronic injury in the lower back compared with the low level of acute injuries reported in prospective studies provided a cause for concern because it is possible that minor traumas experienced by players in this region were not serious enough to prevent players from training or playing and therefore were not recorded during the prospective study.

The prevalence of medically diagnosed OA in the present sample of respondents (32%) was lower than that reported in another sample (49%) of former English professional soccer players.[27] In addition, the level of OA among players who had retired through injury (51%) was twice that observed among players who had not retired through injury (25%). However, the present study was made up of players with a lower mean age (47.6 compared with 56.1 years) and a lower mean age at diagnosis of OA, for all joints (30.2 compared with 39.0 years). In the general male population, the prevalence of moderate or severe OA is less than 10% for the age range 35–44 years, and about 20% for the age range 45–54 years.[28 29] In a Royal College of General Practitioners morbidity survey,[30] the incidence of symptomatic OA for men in the 25–44 and 45–64 year age groups was 5% and 30% respectively over the period 1981–1982. Therefore it can be concluded that the prevalence of OA in retired professional soccer players is greater than that observed in the general population, particularly among those players retiring through injury.

The major symptoms and consequences of joint OA are pain in soft tissue structures such as ligaments, tendon insertions and bursae, and this eventually leads to impaired joint function and pain.[31] In the present study, 80% of respondents reported at least minor joint pain during at least one of the daily static and dynamic activities. In comparison, joint pain reported in other populations[32] varied between 40% and 80%. The weighted joint pain scores were higher for dynamic activities than for static activities for all joints, and the scores for the knee joints were higher than for the hip and ankle joints. The proportion of respondents (37%) who reported pain in the knee joints was also greater than that for the other joints; this may be related to the greater number of acute injuries, surgical interventions, and instances of OA reported for the knee joints. The level of pain reported in the knee joints also tended to be higher than for the other joints.

The lower limbs have been reported as the most common locations for injury in English professional football.[4 20] The severities of acute injuries based on periods of absence—that is, moderate and major—were selected because injuries of this level were more likely to involve cartilage and/or ligament damage rather than just soft tissue contusions. Cartilage degeneration and ligament damage from such injuries have been shown to be strong risk factors in the onset of OA.[9 10 33 34] In this study, on average, soccer players were more likely to receive a moderate injury to the ankle and knee joints than to the hip joint, and players were more likely to receive a major knee injury. This resulted in a higher proportion of players receiving knee surgery and being medically diagnosed with OA in the knee joints compared with the ankle and hip joints. This result is consistent with reports that knee and ankle injuries in UK soccer account for significantly more acute injuries than hip injuries.[4 20 22] The trend is also similar to that found in other European and American studies reviewed by Larson *et al*.[35] Furthermore, it has been shown that moderate and severe injuries to the lower limb joint cartilage and ligament structures predispose joints to OA.[9 10 33 34]

After surgical intervention, there tends to be a delay period before OA can be detected through clinical and radiographic measures,[5] and the age at which surgery takes place also has an influence on the development of OA. In this study, the mean age at which surgery occurred was significantly lower for the ankle (26.4 years) and knee (28.0 years) joints than for the hip joints (37.5 years) by 10 years. Muckle[36] reported that the average age for knee surgery in a group of 50 professional and 41 non-professional soccer players was 23.9 years and that each of these players was also diagnosed with OA within 10 years of surgery.

Neyret *et al*[37] have shown that soccer players who received a knee injury before the age of 35 were diagnosed with OA on average 26 years later, but, if the knee injury occurred after 35 years of age, the mean delay before OA was diagnosed was only 10 years. However, Boszotto *et al*[38] reported that the delay from injury to the diagnosis of OA varied from two to seven years for patients with mild to moderate OA. In our study, respondents reported medically diagnosed OA in lower limb joints 4.1–8.3 years after surgery. The shorter duration from surgery to medical diagnosis of OA in our study may be because, before surgery, players may already have been experiencing the pathological changes associated with joint destruction resulting from high levels of acute injury. These changes would include defective integrity of the articular cartilage, changes in the underlying bone, and changes at the joint margins.[39]

The training and competition loading patterns for respondents were used in this study to calculate DAR values for each joint. These values were obtained from the time spent during various forms of training, which have been identified as confounding factors associated with musculoskeletal pain and the risk of joint OA.[14 16 17] It must be recognised, however, that the loading rates used in these calculations are dependent on respondents' abilities to remember their typical workload patterns throughout their playing careers. In our study, the exposure times for professional players were reported to

be significantly higher than the exposure times for youth and retired players. At all stages of the respondents' careers, significantly more time was spent on soccer specific activities, which has also been reported as a high risk factor for the development of joint OA.[16]

Kujala *et al*[16] and Raty *et al*[17] provided a breakdown of lifetime weekly average exposures for endurance (1.1 hours), soccer specific (3.5 hours), and power training (0.1 hours) activities in elite Finnish soccer players. The average age of these players was 56.5 years at the time of the survey, which is nearly 10 years older than in our study. The higher levels of training recorded by respondents in the present study may account for the earlier age at which OA was diagnosed. Klunder *et al*[8] have reported an exposure time in a sample of soccer players of 6.7 hours per week for 22.8 years. This sample of players had a greater prevalence of OA in the ankles (53% *v* 33%) and hips (49% *v* 26%), but not knees (14% *v* 12%), than a control group.

Using the total exposure rates from respondents' replies, it was calculated that the DARs per 100 000 hours of exposure were greatest for the knee joints (2.0) followed by the ankles (0.6) and hips (0.3). A comparison of the DARs presented here with acute injury exposure rates presented by Hawkins and Fuller[4] indicates that, on a probabilistic basis, one case of OA in a professional soccer player is likely to occur for every 390 acute injuries, or the equivalent of three Premier League players being diagnosed with OA every season.

Cooper *et al*[31] identified epidemiological evidence that professional soccer as an occupation contributes to the risk of OA at the hip and knee joints. However, the weight of evidence at present may not be sufficient to tip the balance in favour of compensation for players in this occupation.[31] This supported the decision of the UK Industrial Injuries Scheme not to register professional soccer as an occupation under the Contributions and Benefits Act 1992. However, the present study has indicated that there is significant cause for concern over the level of OA found in retired professional soccer players compared with the general population and that the evidence indicates that a health surveillance programme would be highly desirable for professional soccer players.

The objectives of this study were to investigate and describe the prevalence of OA and the level of pain reported in lower limb joints by retired English professional soccer players. Nearly half (47%) of all the players in the sample suffered career ending injuries. Of these, 42% retired because of an acute injury and 58% because of a chronic condition. In addition, 32% of all players had been medically diagnosed as suffering from OA in one of the lower limb joints. However, 80% of all players exhibited at least minor pain symptoms in at least one of the lower limb joints. There is sufficient evidence to warrant the implementation of further control measures including the introduction of health surveillance for professional soccer players as part of an overall risk management process.

We would like to acknowledge the invaluable assistance provided by the Professional Footballers Association, in particular the help provided by George Berry and Lindsay Gallagher in administration of the players' database. SD acknowledges financial support from Loughborough University while undertaking part of the work described here.

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Take home message

The risk of work related osteoarthritis in the lower limb joints of retired professional soccer players is significantly higher than in the general population. The evidence indicates that players should be provided with health surveillance during their playing careers to identify the onset of this problem and to minimise the long term health risks.

Commentary

This is an important study for two reasons. Firstly, it documents—as did another recent paper[1]—the high level of OA among retired footballers, a matter that the authors correctly describe as a "significant cause for concern". Secondly, and more worryingly, it is one of a growing number of studies all of which raise serious concerns about health and health care in professional soccer in England.

For example, in addition to specific concerns about OA, dealt with in this paper, recent research has indicated that the overall risk of injury to professional footballers is no less than 1000 times higher than the risk of injury in other occupations normally considered high risk, such as construction and mining.[2] Another study of five English professional clubs found that they were not meeting the legal requirements set out in the Management of Health and Safety at Work Regulations of 1992,[3] while a risk assessment of grounds for player safety indicated that only 42% of English clubs (but 71% of Scottish clubs) achieved an acceptable score.[4] Yet another study concluded that "it appears that English professional football clubs have a long way to go to provide high quality sports science advice to players and to meet the standards of health and safety management acceptable as common practice amongst leading continental football clubs".[5] And most recently, research on club doctors and physiotherapists in English professional clubs has cast doubt on whether they have appropriate qualifications and experience, and has described all aspects of the appointment and remuneration of club doctors and physiotherapists as a "catalogue of bad employment practice".[6]

These studies collectively paint a picture of risk management and health care provision in professional football clubs that is a matter of serious concern. It has recently been calculated that many English clubs spend only about 2.5% of the asset value of their playing staff on medical care; this may be compared with a typical company car fleet where the annual maintenance and insurance costs would be in the region of 20–30% of the value.[7] One might reasonably ask how much more evidence the Football Association needs before it requires the clubs to take the long overdue measures required to meet the "duty of care" that they have, in both a legal and a moral sense, to the players in their employment.

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