

Long term health impact of playing professional football in the United Kingdom

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Abstract

Objective—To describe the long term impact of football on the health related quality of life (HRQL) of former professional footballers in the United Kingdom.

Method—A cross sectional survey gathered data from 284 former professional players. Respondents reported medical treatments, osteoarthritis (OA) diagnosis, other morbidity, disability status, and work related disability since their football career. The EuroQol (EQ-5D) and global health rating scales were selected to assess HRQL.

Results—Medical treatment for football related injuries was a common feature, as was OA, with the knee being the most commonly affected joint. Respondents with OA reported poorer HRQL compared with those without OA. As with medical treatments and problems on each of the five EQ-5D dimensions (pain, mobility, usual activities, anxiety/depression, self care), frequency of disability and work related disability were higher among respondents with OA than those without.

Conclusion—This exploratory study suggests that playing professional football can impact on the health of United Kingdom footballers in later life. The development of OA was associated with poorer outcomes on all aspects of HRQL. (*Br J Sports Med* 2000;34:332-337)

Keywords: football; retirement; osteoarthritis; knee; health related quality of life

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With the global popularity of football both as a spectacle and a form of recreational exercise, there is growing interest in determining whether playing poses any immediate and long term health risks. In the United Kingdom, the Football Association is currently conducting a two year research project consisting of an audit of all injuries suffered by professional players in England and Wales. Findings will be used to promote injury prevention strategies.

Football is a high speed contact sport with a high incidence of injuries. Several studies have reported the prevalence, severity, and types of injuries associated with playing football at the elite level.¹⁻⁴ The most common injuries are sprains and strains affecting mainly the ankle and knee joints.⁵ A recent United Kingdom

report found that knee injuries, particularly cruciate ligament and meniscus injuries, accounted for nearly half (49%) of all injuries resulting in enforced premature retirement for the period 1987/88 to 1994/95.⁶ Other studies have provided details about the long term outcomes of surgical procedures—for example, meniscectomy—undergone by players during their playing career.⁷⁻⁹ Injuries and surgery to the meniscus are suggested risk factors for knee osteoarthritis (OA).^{3 10}

OA is a form of joint disease in which there is damage to the joint surface and an abnormal reaction in the underlying bone. Research has generally shown that, compared with age matched controls, former elite players have an increased risk of developing OA of the hip^{11 12} and knee joint.^{3 13} Prevalence of OA among Scandinavian former top level players varies between 14%¹² and 52.7%¹¹ depending on diagnostic criteria and joint(s) examined.

A few European studies have reported musculoskeletal symptoms in former elite players.^{14 15} Less attention has been paid to describing how OA impacts on former players' health related quality of life (HRQL).³ This is an important omission because general population studies have consistently shown that OA of the knee and/or hip is a common cause of pain and disability.^{16 17} Moreover, the disease can have a negative impact on many other dimensions of HRQL including psychological wellbeing, employment, and activities.^{18 19} Given these findings, one may expect the HRQL of some United Kingdom former players with OA to be similarly adversely affected. Indeed, anecdotal evidence of this has been presented in the media.^{20 21}

The aims of this study were to address the limitations outlined above by (a) describing the long term consequences of playing professional football in the United Kingdom in terms of medical treatments and development of OA, and (b) examining the impact of OA on HRQL.

Method

SUBJECTS

The sample was recruited through five Former Players Associations (FPAs). Overall, 284 of the 515 questionnaires distributed were returned, giving a response rate of 55%. The method of distribution prevented a detailed investigation of non-response (see below).

PROCEDURE

Data were gathered by a self administered postal survey. To ensure anonymity, the survey and follow up reminder were distributed by officials of the FPAs. The authors did not have direct access to the names and addresses of former players.

The survey gathered data on the following:

- (1) Demographics and career details: age, age at retirement, number of games played, career length.
- (2) Treatment experience since retiring from professional football as a result of injuries sustained during their professional career: self reported frequency and types of treatments received, treatments currently awaited, and current use of medication.
- (3) OA diagnosis: respondents were asked if they had been diagnosed with OA and at what age they were diagnosed. They also provided information about other morbidity and disability status.

HRQL

In recognition of the multidimensional impact of illness and disease, there has been a growing awareness of the importance of investigating and measuring HRQL, yet there is neither an agreed definition of HRQL nor agreement on how to measure it.²² Health status, functional status, and HRQL are terms often used interchangeably to describe disease impact.²² Muldoon *et al*²² stress the importance of assessing mental as well as physical functioning and also emphasise the importance of measuring subjective as well as objective appraisal of health. Variables such as pain, mobility, psychological wellbeing, daily activities, employment, and health perception are common, although not exhaustive, HRQL dimensions.²³

In this study, HRQL was assessed using the EuroQol (EQ-5D)²⁴ perceived ratings of current and future health, and work disability. The EQ-5D is a widely used short generic measure of health status. Construct validity of the EQ-5D has been tested in an arthritis population.²⁵ It consists of five domains: mobility, self care, usual activities, pain/discomfort, and anxiety/depression, with each dimension divided into three levels: 1, no problems; 2, some problems; 3, extreme problems. The EQ-5D can be presented in two ways: (a) as a health index (EQ-5D_{utility}), by applying relative weights²⁶ which are attached to the five domains to provide a utility score ranging from 0 (death) to 1 (perfect health); (b) as a profile (EQ-5D_{profile}), based on the unweighted responses indicating a person's level of problems in each of the five domains. Both weighted and descriptive analyses are presented here.

Perceived current and expected future physical health status were measured separately with standard 100 mm horizontal visual analogue scales anchored by "poor/perfect" and "worst possible/best possible" health status respectively. Scores range between 0 and 100, with higher scores representing better current and expected future health status.

An open ended question was used to elicit information on respondents' experience of work related problems resulting from injuries sustained during their professional career.

ANALYSIS

The Statistical Package for the Social Sciences (SPSS Inc, Chicago, Illinois, USA)²⁷ was used to perform all data analyses. Unrelated *t* tests and χ^2 tests were used where appropriate to examine differences in HRQL between respondents with OA and those without. Moderate and extreme problems were combined for analysis of the EQ-5D_{profile}. The χ^2 test was also used to calculate differences in treatment reporting.

Results

DEMOGRAPHICS

The mean (SD) age of the respondents was 56.1 (11.8) years, with a mean (SD) age at retirement from professional football of 32.3 (4.7) years. A total of 147 (52%) respondents gained representative honours, and, of these, 76 (52%) had been senior internationals. Most players (63%) had, at some time in their professional career, played in the Premier Division (formerly Division 1). The mean (SD) professional career length was 13.5 (5.3) years, and nearly two thirds (60%) had played over 450 competitive games.

TREATMENT EXPERIENCE SINCE RETIRING FROM PROFESSIONAL FOOTBALL

Surgical treatment

Since retiring from professional football, 92 (32%) respondents reported having surgery on at least one occasion. Of the 75 respondents who reported specific types of surgery, 48 had had knee surgery, of which 10 were joint replacements. Fifteen respondents reported having had hip surgery, of which 12 were joint replacements. Six respondents reported having two joints replaced. Twenty four (9%) respondents were currently awaiting surgery, 13 for joint replacement operations (seven hip and six knee).

Non-surgical treatment and medication

In all, 123 (43%) respondents reported having had at least one non-surgical treatment—for example, physiotherapy, acupuncture, massage, ultrasound—for injuries sustained during their career. Of the 107 respondents who provided information, 46 sought treatment for knee problems. Eighty respondents (28%) were currently taking medication to alleviate symptoms—for example, pain, inflammation—associated with football injuries.

OA DIAGNOSIS

A total of 138 (49%) respondents reported receiving a diagnosis of OA in at least one anatomical site, with the mean (SD) age at diagnosis being 40.4 (12.5) years. Table 1 shows that knees were the most commonly affected site. Eighty three respondents had OA in two or more joints, including 47 who had bilateral knee OA, and 42 respondents had OA in three or more joints. In all, 72% of respondents with OA agreed with the statement: "I am concerned with how OA may affect my body in the future".

OTHER MORBIDITY

Eighty respondents reported medical complaints other than OA, the most common being cardiovascular conditions. Ten reported

Table 1 Distribution of osteoarthritis (OA) by anatomical site (many respondents reported OA in more than one site)

Anatomical site	Respondents with OA (n=138)
Right knee	82
Left knee	62
Right hip	18
Left hip	24
Right ankle	33
Left ankle	20
Right foot	6
Left foot	6
Back	26
Neck	22
Other*	15

*For example, elbow, wrist, hand, shoulder, pelvis.

Table 2 Comparison of health related quality of life of respondents with and without osteoarthritis (OA)

Variables	OA respondents (n=138)	Non-OA respondents (n=146)	p Value (t test)
EQ-5D _{utility} (scale 0–1)	0.58 (0.31)	0.81 (0.19)	<0.001
Current health (scale 0–100)	56.4 (25.6)	70.4 (20.0)	<0.001
Future health (scale 0–100)	60.2 (23.3)	75.2 (19.3)	<0.001

Values are mean (SD). The higher the results the better the quality of life.

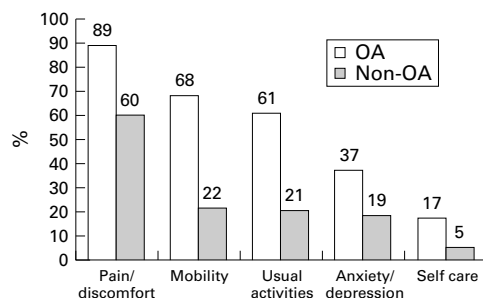


Figure 1 Distribution of moderate or severe problems on EQ-5D_{profile} dimensions by osteoarthritis (OA) status (%). Usual activities means work, study, housework, family, or leisure pursuits; self care means washing/dressing.

neuropsychological problems—for example, memory complaints, dizziness, headaches. Of the 43 (15%) respondents who were registered disabled, 33 had OA.

COMPARISON OF HRQL RESPONDENTS WITH AND WITHOUT OA

There were no significant differences between respondents with OA and those without OA with respect to possible confounding influences of age or other morbidity. Table 2 shows that respondents with OA scored significantly lower on EQ-5D_{utility} and perceived health rating scales than respondents without OA, indicating poorer subjective health in the former group.

Figure 1 shows that a significantly higher proportion of respondents with OA reported problems on each of the five EQ-5D_{profile} dimensions: pain, mobility, usual activities, self care, ($\chi^2 = 31.04, 59.27, 46.18, 10.93$ respectively, all $df = 1, p < 0.001$) and anxiety/depression ($\chi^2 = 10.48, df = 1, p = 0.001$).

WORK DISABILITY

Forty five (16%) respondents, most of whom ($n = 38$) had developed OA, felt that their injuries had impacted on employment opportunities subsequent to retiring from professional football.

Discussion

This exploratory study provides a unique and important insight into the self reported health status of a sample of former elite footballers in

Table 3 Distribution of treatments since retiring from professional football, by osteoarthritis (OA) status

Treatment	OA respondents (n=138)	Non-OA respondents (n=146)	p Value (χ^2)
Surgical treatment	62 (45)	30 (21)	<0.001
Awaiting surgical treatment	19 (14)	5 (3)	<0.002
Non-surgical treatment	82 (59)	41 (28)	<0.001
Medication	68 (49)	12 (8)	<0.001

Values are expressed as frequency (%).

the United Kingdom. Results suggest that the long term impact of playing professional football is considerable, with many respondents requiring medical treatment for injuries after their professional career had ended. Raty *et al*⁴ found that elite footballers had an increased risk of knee injuries compared with athletes from other sports and that past knee injuries were associated with episodes of monthly knee pain. Results from this study indicate that the knee joint, more so than any other joint, continued to warrant treatment in later life.

OA is a chronic condition with variable pattern of progression and severity and is a major cause of morbidity and disability. Moreover, the disease imposes a considerable burden on the healthcare system and is a common reason for primary care consultations.²⁸ Accordingly, significantly more respondents with OA were using medication and had either had or were waiting for medical treatment including replacement surgery (table 3). Joint replacement is usually performed on patients suffering from severe arthritis where the pain interferes with activities of daily living.²⁹ Replacement surgery can provide pain relief and allow patients to continue appropriate non-impact athletic activities such as swimming, cycling, and golf.³⁰ Over 80% of replacements are successful for up to 10 years, but thereafter some require reoperation. The outcomes of second operations are generally poorer.³¹

Pain is the primary symptom of OA and increases when the affected joint is used.³² Descriptive analysis of the five EQ-5D_{profile} dimensions showed that nearly all respondents with OA reported problems with pain or discomfort. It was interesting to note the proportion of respondents without OA (60%) who reported pain. It is not clear why so many in this group were in pain, although a closer examination of the breakdown of responses showed that fewer (3%) reported severe pain than those with OA (19%). A high proportion of respondents with OA also reported problems with mobility and performing usual activities, and over three quarters of those who reported disability status had OA. Longitudinal studies have shown that arthritis related pain is a risk factor for future physical disability.³³ Although less of a concern, significantly more respondents with OA reported problems with anxiety/depression and self care activities than those without OA, as was the case for each of the five EQ-5D dimensions. Respondents who had OA also perceived their current and future health to be worse than respondents who did not.

Research has established that people with OA experience considerable work disability and loss of earnings.³⁴ This is a cause for concern given the relatively early age at which OA diagnosis occurred in this study. Physically demanding jobs that involve an element of repetitive joint loading can exacerbate OA symptoms.³⁵ Work related problems reported by respondents included early retirement, enforced reduction in the hours worked, or a

change to a more sedentary occupation. Some respondents felt that they were forced to give up a career in football coaching/management because of OA related pain and impairment problems.

An unexpected finding was the presence of a small number of respondents with neuropsychological problems. There is growing, yet at present modest, interest in possible neuropsychological deficits arising from the cumulative effects of heading.³⁶

A response rate of over 50% is considered adequate in postal surveys.³⁷ However, one limitation of the study is the possibility of a self selection bias, as former players with musculoskeletal problems and/or a record of treatment since their football career may have been more likely to respond because of the salience of the topic. This has implications for knowing the true proportion of the sample who had received a diagnosis of OA and the proportion who reported OA related problems—for example, treatments, disability, work disability.

Confirmed medical diagnosis of OA was beyond the scope of this study and conflicts with promised anonymity. However, there is some evidence to support the validity of self report diagnosis. A large scale study³⁸ which relied on self report OA found similar levels of disability to a study using radiographically confirmed OA.³⁹ Further, two studies⁴⁰⁻⁴¹ that compared clinical and self report diagnosis found high levels of agreement. Also, it is worth noting that the prevalence of reported knee OA was 34% in this study, similar to that reported by Kujala *et al.*³ (29%) based on radiographic examination.

It is not clear whether the findings extend to former players who are not members of FPAs. Most respondents in this study had played at the highest level and were members of highly prestigious FPAs. It has been suggested that injury rates may be higher for players at lower skill level⁴² with implications for problems reported in later life. Finally, given the method of data collection and its retrospective nature, we cannot ascertain the accuracy of the information provided. A recent study that compared retrospective and prospective reporting of injuries among the same group of athletes found that a higher number of injuries were recorded prospectively.⁴³ There were no differences between type or site of injury between data collection methods. The authors conclude that minor injuries are more easily forgotten, suggesting that retrospective data collection underestimates incidence rates. In the context of this study, it seems appropriate to suggest that treatment data may similarly be underestimated.

In summary, the results suggest that respondents who reported that they had been diagnosed with OA have a significantly lower HRQL than peers with no diagnosis of OA. The impact of OA was most pronounced in perceived physical dimensions of HRQL such as pain and mobility. However, the disease also had a noticeable psychosocial impact which warrants further attention.

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Take home message

Evidence from this study showing that playing professional football can lead to chronic health problems in later life lends credence to the saying that football is not a game but a disease of the knee.