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OSTEOARTHRITIS OF THE HIP AND KNEE JOINT IN RETIRED FOOTBALL PLAYERS

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The possible relationship between football playing and osteoarthritis in the hip and knee joints has been examined. The results of clinical and radiographic examinations of 57 retired football players and a corresponding control group were compared. Osteoarthritis of the hip joint was found to occur significantly more often in the football players than in the controls. Such a relationship could not be found regarding the knee joint.

Key words: football; hip joint; knee joint; osteoarthritis

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Several studies have been made to investigate the ill-effects of sports on the kinetic system (Carvalho & Langfeldt 1977, Heiss 1929, Puranen et al. 1975); Baetzner (1936) was one of the first to notice the frequent occurrence of degenerative joint changes in top athletes.

Football is probably the most popular ball game in the world, and as such is played by a considerable number of young men. It is, therefore, natural that there has been a growing interest in the possible relation between the development of osteoarthritis in the lower extremities and football playing, and several studies have been published on this subject (Brodelius 1961, Köhler 1955, Solonen 1966, Thorseth 1972). These investigations demonstrated a greater prevalence of osteoarthritic changes in the ankles of football players (Brodelius 1961, Köhler 1955, Solonen 1966), but not in the hip and knee joints (Köhler 1955, Solonen 1966). As a result of the introduction of professional football in Denmark, we found it of interest to re-examine these results. The purpose of this study was to elucidate a possible relationship between top-level football playing over many years and the prevalence of osteoarthritis in the hip and knee joints.

PATIENTS AND METHODS

In cooperation with Vejle football club's secretariat, 62 previously active football players were randomly selected, and 57 agreed to participate in the study. Radiographs of the hip and knee joints were taken and a clinical examination was made. The following information was recorded: age, weight, average number of playing hours per week during the period of activity, the length of the period of sporting activity, occupation, injuries requiring treatment as well as surgery to the lower extremities.

Thereafter, a control group was formed of 57 men admitted to the local hospital for complaints other than neurological and not for problems in the lower extremities. These men had never been active football players. Each person in the control group matched one of the football players with regard to age (± 2 years) and weight (± 5 kg) and all were examined clinically and radiographically, in the same way as the football players.

The radiographic examination used the hospital's routine source-to-film distance of 1 metre. The hip joints were radiographed in the supine position with one film registering the pelvis and both hip joints. The knee joints were radiographed in A-P and lateral projections. The X-rays were all made in the recumbent position, which is the routine in the department, and therefore only distinct changes of osteoarthritis are included in the material.

The radiographs were evaluated by a qualified

radiologist. Radiographic signs of osteoarthritis which were accepted were: diminution of the joint space, sclerosis and/or subchondral cyst formation. In this way, those whose only sign of change was osteophyte formation were eliminated. The rationale for this was that in previous studies, the relationship between osteophyte development and the subsequent occurrence of osteoarthritis could not be confirmed (Danielsson 1964).

The χ^2 test was used to evaluate statistical significance.

RESULTS

The 57 football players had an average age of 56.4 years (40–79), their average weight was 78.5 kg (61–104), the average number of playing hours per week in the period of activity was 6.7 (3–10), and the average period of activity was 22.8 years (11–41). In the control group, the corresponding values were 56.6 years of age (42–80) and 78.1 kg body weight (61–104).

Among the football players, positive signs of osteoarthritis were seen in 30 (52.7 per cent), while the same changes were seen in 19 (33.3 per cent) of the men in the control group. This difference is statistically significant ($P < 0.05$). Twenty-eight (49.1 per cent) of

the 57 retired football players demonstrated positive signs of osteoarthritis in the hip joints. The same changes were seen in only 15 (26.3 per cent) of the 57 controls. This difference is statistically significant ($P < 0.05$). There was no difference regarding the knee joints as osteoarthritis was found in eight previous football players and in seven of the controls.

The localization of the osteoarthritic changes is shown in Table 1. The average age of the 30 football players with radiographic signs of osteoarthritis was 59.5 years and for the 19 in the control group, 60.2 years. Of the 49 individuals with radiographic osteoarthritis, seven presented subjective symptoms. Thirteen football players and three of the control group with definite osteoarthritis had suffered previous injuries to the lower extremities (see Table 2).

Five of the thirteen football players had sustained injuries to the meniscus, four of which had been treated conservatively. One player had been meniscectomized in both knees and had osteoarthritis in both knees. The other four players suffered from bilateral hip joint osteoarthritis, and two of these also presented osteoarthritic changes in the injured knee.

Of the 30 football players with osteo-

Table 1. Localization of radiographically distinct osteoarthritis in 30 football players and 19 controls

	Hip joint		Femoro-tibial joint		Femoro-patellar joint	
	Unilat.	Bilat.	Unilat.	Bilat.	Unilat.	Bilat.
Football players	9	19	4	1	2	4
Control group	3	12	1	4	0	5

Table 2. Number and type of injuries to 13 football players and 3 controls with radiographically verified osteoarthritis

	Football players	Control group
Fracture	3	1
Meniscus lesion	6	2
Other*	7	0

* Distortion, ligament injuries, ruptured tendons, etc.

arthritis, 8 (26.7 per cent) were doing jobs involving heavy physical labour, while of the 19 in the control group, there were 9 (47.4 per cent) doing similar heavy jobs.

DISCUSSION

The aetiology of osteoarthritis is as yet poorly defined. The disease apparently results from a combination of factors, such as age, sex, endocrine balance, injury as well as vocational strain (Isdale 1975, Jurmain 1977). This study demonstrated a significantly higher prevalence of osteoarthritis among retired football players, as compared with a control group. As seen in Table 1, the difference between the groups lies in the frequency of osteoarthritic changes in the hip joint, while the occurrence of changes in the knee joint is rather similar. This finding agrees with Thorseth (1972) who studied the knee joints of 208 retired top football players; the hip joint was not examined. In contrast, the present study did not agree with the findings of Köhler (1955) or Solonen (1966), who found no correlation between football playing and osteoarthritis of the hip joint. A possible explanation could be that the average age in the above studies was 24.5 and 26.0 years, respectively. Moreover, the material from both studies is incomplete, as radiographs were taken of only some of the players examined.

Previous investigations (Puranen et al. 1975, Carvalho & Langfeldt 1977) have shown that the frequency of osteoarthritic changes is not increased by running. The fact that we found an increase in the prevalence of osteoarthritic changes among previous football players could be explained by the fact that running is a physiologic activity while football often involves excess strain on the

lower extremities in the form of non-physiologic attitudes and numerous injuries.

It is concluded that after many years participation in top level football the prevalence of osteoarthritis of the hip joint, but not of the knee, is increased.

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