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SHORT REPORT

Prevalence of knee bursitis in the workforce

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Background Knee bursitis (KB) is a common disorder in specific occupations requiring frequent and/or sustained kneeling postures.

Aims To assess the prevalence of KB in the general working population.

Methods Between 2002 and 2005, a total of 3710 workers of a French region were randomly included in the study. A standardized physical examination of the knee was performed when knee pain was reported by the worker during the preceding 12 months. The criteria for diagnosis of KB were (i) the presence of pain and/or tenderness in the anterior face of the knee at the date of the examination (or for at least 4 days in the preceding week) and (ii) the presence of swelling and/or pressure-induced pain of the pre- or infra-patellar bursa. Occupational risk factors were assessed by a self-administered questionnaire.

Results The prevalence of uni- or bilateral cases of knee bursitis was low: 0.6% [0.2–0.9] in men and 0.2% [0.0–0.6] in women. The highest prevalence was observed in the construction sector (2.3% [0.8–5.4]) and in the food and meat processing industries (1.4% [0.4–3.5)]. More blue-collar workers were affected than other occupation categories (0.8% [0.3–1.2] versus 0.1% [0.0–0.4]).

Conclusions The study showed a concentration of cases among male workers exposed to heavy workloads and frequent kneeling.

Key words Activity sector; knee bursitis; occupation.

Introduction

Knee bursitis (KB) is described as inflammation of the superficial pre- or infra-patellar bursa sac associated with swelling [1]. KB is mainly due to microtrauma generated by repetitive or prolonged kneeling on or leaning against the knee and more rarely due to infection or general diseases. Work-related KB represents about 5% of total body compensated work-related musculoskeletal disorders in the USA [1] and France. KB has mainly been reported in specific working populations particularly exposed to kneeling and squatting postures and heavy physical workload [2–5]. However, little information is available on the prevalence of KB in the general working population.

The surveillance programme of musculoskeletal disorders implemented in a French region by the French Institute for Public Health Surveillance in 2002 [6] allows us to study the prevalence of KB in workers exposed to various levels of constraints for the knee. Our aim in this study was therefore to assess the prevalence of KB in a large sample of workers representative of the working population.

Methods

This cross-sectional study was conducted in the Loire Valley area of west-central France (5% of the French working population), which has a similar economic structure to that of most French regions [7]. Subjects were randomly selected from workers undergoing the mandatory annual health examination between April 2002 and April 2005 by one of the 83 occupational physicians (OPs) participating in the study. All OPs were trained by the investigators to perform a standardized physical examination [7]. Symptoms of the knee area occurring during the preceding 12 months were assessed using the

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'Nordic' auto-questionnaire (manikin to denote the knee area) [8]. A standardized physical examination of the knee was performed if knee symptoms had occurred during this period. Criteria for diagnosis of KB were (i) pain and/or tenderness in the anterior face of the knee at the date of the examination or for at least 4 days in the preceding week and (ii) swelling and/or pressure-induced pain in the pre- or infra-patellar bursa.

Physical workload was assessed using a Rating Perceived Exertion Borg scale (20-RPE) graduated from 6 ('very, very light') to 20 ('maximum exertion'). The frequency of squatting and kneeling postures was quantified by a 4-level Likert-type scale as follows: never or practically never, less than 2 h per day, 2–4 h per day and more than 4 h per day [9]. The prevalence of KB was computed by subject according to age, economic sector and occupation (bilateral cases of KB counted as one disorder).

Results

The study population comprised 3710 workers (58% men; mean age of 38.7 ± 10.3 years). Two per cent of workers refused to participate in the study, and for 5%, either questionnaire or physical examination was incomplete because of lack of time. Twenty-one cases of KB were diagnosed in 15 workers (12 men) and 40% were bilateral. The overall prevalence of uni- or bilateral cases of KB was 0.4% (95% CI [0.2–0.6]). The highest prevalence in men was observed in young (20–29 years) and middle-aged (30–39 years) workers (Table 1).

KB prevalence was highest in the construction sector (2.3% [0.8–5.4]) and in the food and meat processing industries (1.4% [0.4–3.4)]). Blue-collar workers were more often affected than other occupation categories (0.8% [0.3–1.2] versus 0.1% [0.0–0.4]), mainly skilled crafts blue-collar workers (2.2% [0.8–4.8]) (such as painters, floor layers, plumbers and builders) and truck-drivers (1.7% [0.2–5.9]) (Table 2).

Table 1. Prevalence of KB by age and sex

Age	Men		Women		Whole	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
<30 (*n* = 839)	4 (0.8)	0.2–2.1	1 (0.3)	0.0–1.6	5 (0.6)	0.2–1.4
30–39 (*n* = 1085)	4 (0.6)	0.2–1.6	0 (0)	–	4 (0.4)	0.1–0.9
40–49 (*n* = 1095)	2 (0.3)	0.0–1.2	0 (0)	–	2 (0.2)	0.0–0.7
50–59 (*n* = 690)	2 (0.5)	0.1–1.8	2 (0.7)	0.1–2.5	4 (0.6)	0.2–1.5
Total (*n* = 3710)	12 (0.6)	0.2–0.9	3 (0.2)	0.0–0.6	15 (0.4)	0.2–0.6

Table 2. Prevalence of KB depending on economic sector and occupation

Economic sector	*n* (%)	95% CI
Food and meat processing (*n* = 295)	4 (1.4)	0.4–3.4
Basic metals and fabricated metal products (*n* = 102)	2 (2.0)	0.2–6.9
Manufacture of machines and equipment (*n* = 115)	1 (0.9)	0.0–4.7
Construction (*n* = 214)	5 (2.3)	0.8–5.4
Retail business and repair (*n* = 259)	1 (0.4)	0.0–2.1
Post and telecommunications (*n* = 117)	1 (0.9)	0.0–4.7
Service activities for companies (*n* = 392)	1 (0.3)	0.0–1.4
Occupation		
Upper white-collar and professionals (*n* = 288)	0 (0)	—
Technicians and intermediate occupations (*n* = 829)	1 (0.1)	0.0–0.7
Lower white-collar workers (*n* = 986)	2 (0.2)	0.0–0.7
Blue-collar workers (*n* = 1586)	12 (0.8)	0.3–1.2
Skilled craft blue-collar workers (*n* = 271)	6 (2.2)	0.8–4.8
Truck-drivers (*n* = 119)	2 (1.7)	0.2–5.9

High perceived workload (RPE-Borg scale over 13) was associated with higher prevalence of KB (0.7% versus 0.1%, $P < 0.01$). The prevalence of KB increased significantly ($P < 0.01$) with duration of exposure to repetitive and/or sustained kneeling postures during the working day: from 0.1% in the absence of kneeling to 0.3% when kneeling for less than 2 h, 0.7% for 2–4 h and 3.6% for more than 4 h. About 87 and 67% of workers suffering from KB reported exposure to heavy perceived workload and to kneeling for more than 2 h per day, respectively.

Discussion

KB represented less than 5% of the musculoskeletal disorders diagnosed in male workers, which is consistent with workers' compensation claim data in France and the region. Our study shows the low prevalence of KB in this large sample of workers representative of a regional workforce. This contrasts with the high prevalence reported in the literature (from 6 to 44%) in selected occupations (e.g. floor layers) [2,3,5]. This can be explained by the fact that our study involved workers exposed to various levels of biomechanical knee constraints and not just highly exposed workers and also that

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one of the studies assessed self-reported knee-complaints [2]. The high representativeness of the study sample in relation to the regional workforce allows greater generalization of the results than epidemiological studies conducted in selected occupations.

Our study has certain limitations. The findings involved only salaried workers surveyed by OPs (self-employed craftsmen and farmers were not included). The protocol required no examination of the knee when there was no pain. Since KB is usually only moderately painful, this could have led to underestimation of its prevalence. Despite OPs being trained by the investigators to perform a standardized physical examination of the knee, interassessor bias with the diagnosis of KB was possible after the clinical examination (arthritis or traumatic knee inflammation could have been confounders).

Despite the low overall prevalence, a high prevalence of KB was reported in the construction sector and in skilled crafts blue-collar workers, in accordance with the literature [2,3,5]. Workers exposed to heavy workloads were at high risk of KB, which is consistent with epidemiological findings on KB and knee osteoarthritis [2–4,9]. Our study confirms that workers suffering from KB performed frequent and/or sustained kneeling, which agrees with studies conducted in occupations at very high risk, such as tilers and carpenters [2–5]. The high prevalence of KB in truck-drivers could be due to frequent squatting and prolonged contact stress during driving [10].

Key points

- This study showed the low prevalence of knee bursitis in a large and representative sample of workers which contrasted with the high prevalence usually reported in selected occupations.
- A high prevalence of knee bursitis was reported in the construction sector and in skilled crafts blue-collar workers.
- Workers suffering from knee bursitis were exposed to heavy workloads and performed frequent and/or sustained kneeling.

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Conflicts of interest

None declared.

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