Prevalence and characteristics of hip involvement in spondyloarthritis: a single-centre observational study of 275 patients

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Abstract

Objectives

Hip involvement is a classic feature of spondyloarthritis (SpA). The aim of the present paper is to study the prevalence, clinical and radiological features of hip involvement, and the association with criteria for severity, in a cohort of patients with SpA in a tertiary care centre.

Methods

Design: retrospective single-centre observational study in 2010 of patients with definite SpA who underwent direct interview by a physician. Hip involvement was defined as hip pain considered related to SpA inflammation and confirmed radiographically. Other data collection: demographic data, SpA characteristics, treatments performed for hip involvement. Analysis: prevalence of hip involvement was analysed according to disease duration (Kaplan-Meyer). Multivariate Cox analysis compared patients with vs. without hip involvement over time.

Results

In all, 275 SpA patients were assessed. The median age was 45 (IQR 35–55) years, the median SpA symptom duration 14 (7–25) years, 61% (169) were men, and 79% were HLA-B27 positive. Hip involvement was found in 18% (49) SpA patients, with already 13% after 5 years of disease duration and with frequent bilateral involvement (61%). Hip involvement was associated with non-Caucasian origin (p=0.05). Thirty-three percent (16/49) needed surgery (23 total joint replacements in all) with good functional results.

Conclusion

Hip involvement is a frequent manifestation in SpA (18%), often bilateral, and associated with non-Caucasian origin. One third of the patients needed total joint replacement. Physicians should be wary of hip pain in SpA patients and implement rapid diagnostic procedures in such cases.

Key words

spondylarthritis, hip involvement, prevalence

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Introduction

Spondylarthritis (SpA) is an inflammatory disease that can affect the spine, the sacroiliac joints and the peripheral joints. Hip involvement is a classic feature of SpA which is considered to be the result of inflammation of the coxofemoral joint, and is defined either as an excess of inflammatory synovial fluid, and/or cartilage destruction. The bone-cartilage interface is involved with inflammatory cells (T cells particularly), hypervascularisation and high levels of osteoclast activity leading to subchondral inflammation (1-2). Although a number of reports (3-8) showed the importance of hip involvement in SpA and recently, Van der Cruyssen *et al.* (9) have described a large cohort of ankylosing spondylitis (AS) patients with hip involvement with emphasis on the epidemiology and risk factors for hip involvement and joint replacement, it is still not well studied in all SpA entities (including psoriatic arthritis) (10). Furthermore, the time to appearance of hip symptoms is unclear (10).

The present work studied hip involvement in SpA, with the following specific objectives: (a) to describe the prevalence of hip involvement, (b) to describe its clinical and radiological pattern in patients with SpA, (c) to describe the different treatments used with their efficacy and (d) the association of hip involvement with criteria for severity.

Materials and methods

Study design

A cross-sectional retrospective observational study, COSPA (COchin SPondylArthritis), was performed between November 2009 and July 2010, in one tertiary referral centre (11). The study was in accordance with ethical standards in France; oral informed consent was obtained from each patient.

Patients

Patients were selected from the unit database through the key-words "spondyloarthritis", "spondylarthropathy" or "psoriatic arthritis". All patients living in Paris or in the suburbs of Paris and seen in our department in the last four years were selected, if they fulfilled Amor's criteria (12) or ASAS (Assessment in Ankylosing Spondylitis) axial or peripheral SpA criteria (13). In all, 1237 patients were selected; a random sample of 590 was contacted (Fig. 1).

General data collection

General data collected were age, sex, ethnic group, disease duration, SpA subtype (axial, peripheral, enthesitis or extra-articular: predominant manifestation according to the patient file), exact diagnosis (ankylosing spondylitis, reactive arthritis, chronic inflammatory bowel disease with arthropathy, psoriatic arthritis, undifferentiated spondylarthropathy or juvenile SpA [onset at <16 years old]), HLA B27 status, radiographic sacroiliitis according to modified New York criteria (14) on the most recent radiographs available and the different treatments required over the disease duration.

Hip involvement: data collection and interpretation

Data were collected on the basis of face-to-face interviews by 8 residents, completed with medical files and radiographs taken as part of usual follow-up. Hip involvement was defined as hip pain considered by the senior rheumatologist as related to hip inflammation due to SpA and radiographically as loss of joint space width. This diagnosis was confirmed by the medical file and other imaging procedures if available. The prevalence and clinical characteristics of hip involvement were collected: date of appearance with first symptom suggestive of hip involvement, pattern of joint involvement, duration of the episode(s), radiographic characteristics and date, specific or general treatments performed with their patient-reported efficacy, including functional outcomes of total joint replacement (TJR).

Comparisons between patients with and without hip involvement were performed, concerning demographic characteristics, SpA subtype, exact diagnosis, disease duration and presence of severity criteria of SpA including multiple syndesmophytes (n≥3 assessed on the most recent spinal radiographs), a BASFI score (Bath ankylosing spondylitis functional index) (15) superior to 40.

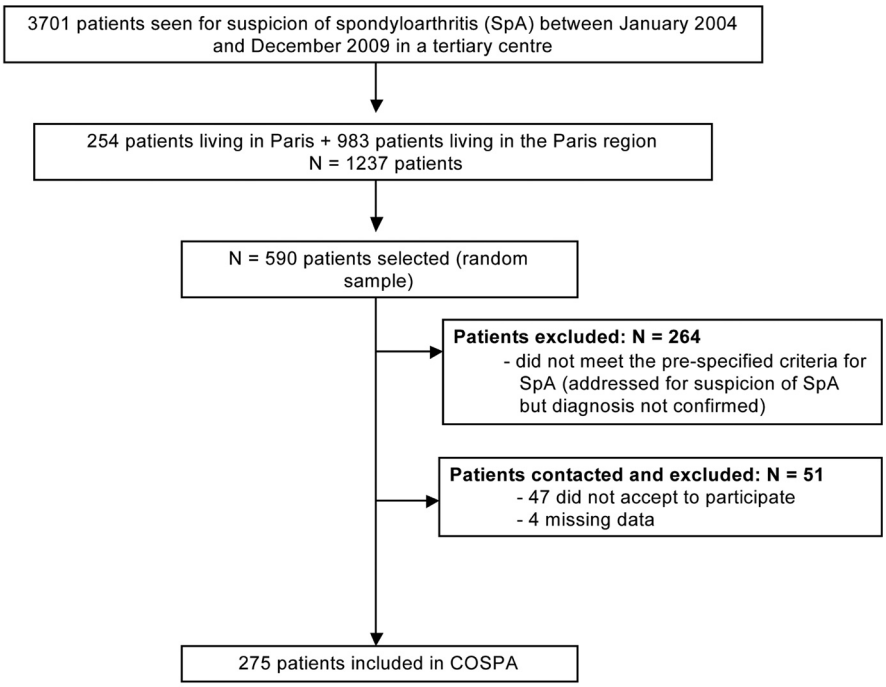

Fig. 1. Flow chart of patient's selection in the COSPA study, to collect data on patients with spondyloarthritis during a direct interview in a tertiary rheumatology centre.

Table I. Characteristics of 275 SpA patients according to presence or absence of hip involvement.

	All patients	With hip involvement	Without hip involvement	*p*-value
Total n (%)	275	49 (18)	226	
Men, n (%)	169 (61)	41 (84)	128 (57)	0.014
Caucasian origin, n (%)	241 (88)	39 (80)	202 (89)	0.091
North-African origin, n (%)	20 (7)	8 (16)	12 (5)	0.014
Median age at diagnosis, (Q1–Q3)	30 (23-41)	24 (20-34)	32 (24-42)	0.005
Median duration of SpA disease (Q1–Q3)	14 (7-25)	22 (14-31)	13 (6-22)	0.470
HLA B27, n (%*)	199 (79)	39 (89)	160 (77)	0.199
Family history of SpA, n (%)	116 (43)	23 (47)	93 (42)	0.186
Inflammatory low back pain, n (%)	220 (81)	44 (90)	176 (79)	0.352
Sacroilitis on radiograph, n (%*)	190 (75)	40 (87)	150 (72)	0.453
Sacroilitis on MRI**, n (%*)	66 (48)	9 (45)	57 (48)	0.895
At least once during SpA disease (not current), n (%):				
peripheral arthritis	127 (46)	29 (59)	98 (43)	0.009
heel pain	130 (47)	24 (49)	106 (47)	0.374
thoracic pain	102 (37)	17 (35)	85 (38)	0.415
psoriasis	84 (31)	12 (24)	72 (32)	0.792
uveitis	77 (28)	15 (31)	62 (27)	0.594
IBD***	44 (16)	7 (14)	37 (16)	0.878
Juvenile-onset SPA, n (%)	68 (25)	20 (41)	48 (21)	0.032
Initial efficacy of NSAIDs****, n (%)	222 (82)	43 (88)	179 (79)	0.761
At least one intra-articular injection, n (%)	24	24 (49)	–	–
Bamboo spine, n (%)	30 (13)	16 (39)	14 (7)	0.008
Vertebral bridge, n (%)	49 (21)	18 (46)	31 (16)	0.139
BASFI >40, n (%)	72 (27)	15 (31)	57 (26)	0.652
BASDAI, n (%)	28 (15-45)	24 (15-42)	29 (15-46)	0.363
Uveitis, n (%)	77 (28)	15 (31)	62 (27)	0.594

*% is the percentage of the available data; **MRI: magnetic resonance imaging; ***IBD: inflammatory bowel disease; ****NSAIDs: non-steroidal anti-inflammatory drugs. BASDAI: Bath ankylosing spondylitis disease activity index.
p-value: Log rank test.

Statistical analysis

Prevalence was defined as the number of SpA patients with hip involvement, over the total number of patients with SpA. Prevalence was also estimated over time by the Kaplan-Meier technique. Descriptive statistics were used for characteristics of the pain, radiographs and treatments. Continuous variables were given as median values (interquartile range, IQR). In order to evaluate the specific characteristics of the patients/disease features associated with hip involvement, log-rank analysis was first conducted to compare the patients with or without hip involvement over time. All the characteristics picked up in this analysis with p-value <0.2 were entered in a multivariate Cox analysis. P-values ≤0.05 were considered significant. Analyses were performed using the SAS statistical software version 9.1.

Results

Patients' characteristics (Table I)

In all, 275 patients were included in a preselected random sample of 590 patients (Fig. 1). The median age when interviewed was 45 years (IQR: 35–55), the median age at diagnosis was 30 years (23–41) and the median SpA symptom duration was 14 years (7–25). A hundred and sixty nine patients (61%) were men, 241 were white (88%), whereas 20 were of North-African ethnic origin (7%), 199 (79% of available data) were HLA-B27 positive and 68 (25%) had a juvenile-onset SpA. Inflammatory low back pain was or had been present in 220 (81%), usually starting before the age of 45 years (73%) and peripheral arthritis was found in 127 (46%). Extra-articular involvement concerned 169 (61%) patients, inflammatory bowel disease 44 (16%) and psoriasis (cutaneous and/or articular) 84 (31%). However, only 49 patients (18%) were classified as psoriatic arthritis patients. Sacroiliitis on x-ray was found in 190 (75% of available data). In all, 161 (59%) patients were treated at some time in the disease course by TNF-α inhibitors.

Prevalence of hip involvement over time (Fig. 2)

Of the 49 patients with hip involvement (18% of all SpA patients), the Kaplan-

Meier technique estimated prevalence of hip involvement was 13.4% (confidence interval, CI 9.1–17.6), 16.9% (CI 11.8–22.0), and 25.5% (17.7–33.3) after 5, 10 and 20 years of SpA disease duration, respectively. At the time of SpA diagnosis, 18 patients had already hip involvement, corresponding to 36.7% of patients with hip involvement.

At the time of the first hip involvement (considered as the first hip pain compatible with arthritis further confirmed by imaging), the median SpA disease duration was 4 years (IQR, min=0 and max=44).

Description of hip involvement

In all, 30 of 49 (61%) patients with hip involvement had bilateral involvement. Regarding the coxo-femoral involvement on the radiograph, global narrowing was found in 19 of 43 patients (44%), supero-external narrowing in 8 (17%) patients and supero-internal in 3 (7%) patients. Cotyloid osteophytes were found only in 6 (13%) patients and femoral osteophytes in 5 (10%) with ischiopubic enthesopathy also in 5 (10%).

Concerning the treatments used in this subgroup of patients, 49% (24/49) had at least once an intra-articular hip injection of corticosteroids: 67% (33) with triamcinolone hexacetonid (delayed acting) and 14% (7) with cortivazol (semi-delayed acting). Sixteen patients (33%) had TJR, bilateral in 44% of those 16 cases, for a total of 23 TJR. Patient perceived functionality was good (3 patients, 24%) to excellent (8 patients, 71%). Three patients (19%) had complications after surgery (TJR loosening) and 4 TJR had to be replaced (twice for one patient). Moreover, in patients with hip involvement, the use of TNFα inhibitors at least once was frequent: 44/49 patients (90%), but usually after first hip symptoms.

Factors associated with hip involvement

– Ethnicity

Ethnic origin was Caucasian for 39 patients (80% of 49), North-African for 8 (16%), South American for 3 and Asian for 1. Thus, 40% of the North-Africans analysed had hip involvement *vs*. only 16% of Caucasians (p=0.014). Ethnicity was predictive in multivariate analyses (Table II).

– Peripheral arthritis

Presence of peripheral arthritis during the whole disease duration was associated with hip involvement (29/49 [59%] *versus* 98/226 [43%]), although the association was not statistically significant in multivariate analysis (HR 3.16 [CI 0.96–10.38] and p=0.058).

– Other factors

Other factors found in univariate analysis: a) for patients with hip involvement, median age at diagnosis of SpA was younger, with a mean of 24 (20–34) years, and a juvenile start was frequent (41%); b) more men (41, 84%) had hip involvement; c) a trend for sacroilitis on radiograph (40, 87%), HLA-B27 (39, 89% available data) and family history of SpA (23, 47% available data) was also observed; d) as a marker of severity, patients with hip involvement more often had bamboo spine, 39 *versus* 7% (p=0.008) and more often were treated with anti-TNF (anti-tumour necrosis factor) medications (p=0.005) for management of symptoms.

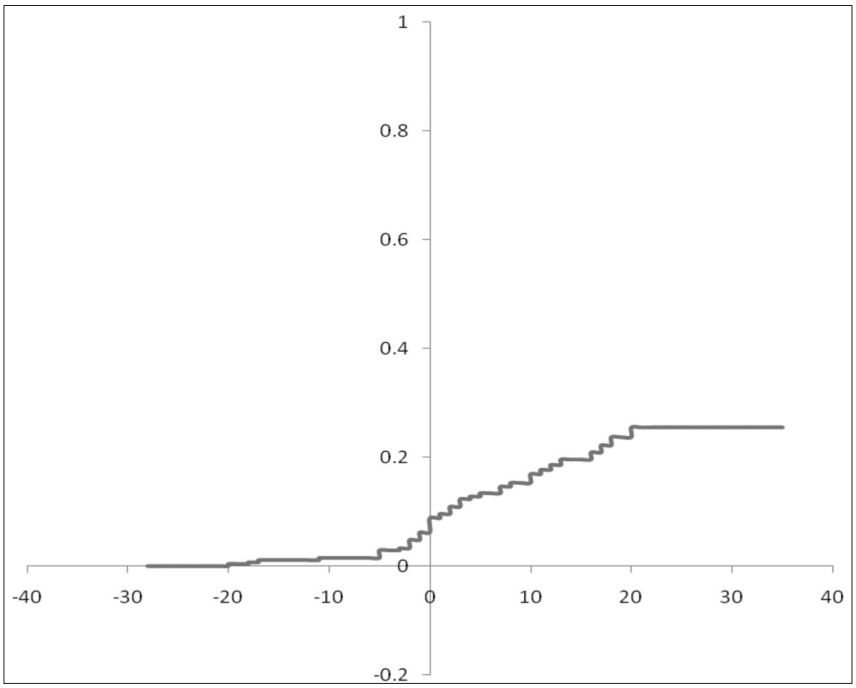

Fig. 2. Prevalence of hip involvement according to time (Kaplan-Meier survival technique):
X axis: years of follow-up before or after SpA diagnosis; Y axis: percentage of patients with hip involvement.

Table II. Multivariate Cox model for patients with hip involvement.

	p-value	HR [95%CI]
Age	0.355	0.97 [0.91–1.03]
Age at diagnosis	0.887	1.01 [0.94–1.08]
Sex (female)	0.104	2.96 [0.80–10.98]
Ethnic group (Caucasian)*	0.050	4.20 [1.00–17.70]
Family history of SpA	0.340	0.60 [0.21–1.72]
HLA B27	0.992	–
Peripheral arthritis**	0.058	3.16 [0.96–10.38]
At least once on anti-TNF-α	0.217	2.67 [0.56–12.70]
Bamboo spine	0.223	4.12 [0.42–40.07]
Vertebral bridge	0.891	1.18 [0.12–11.90]

*Increasing risk of hip involvement for non-Caucasian patients with a HR of 4.20 (reference: Caucasian = yes); **Increasing risk of hip involvement for patients with peripheral arthritis with a HR of 3.16 (reference: arthritis = no).

Discussion

In the present study, hip involvement was a frequent manifestation in SpA with a prevalence of 18% of all SpA patients concerned, with higher prevalence as disease duration increased (*e.g.* up to 25% after 20 years of disease duration). Hip involvement appeared to be associated with non-Caucasian ethnic origin and the association with a concomitant peripheral arthritis was close to statistical significance (p=0.058). The involvement was frequently bilateral, sometimes appearing early in the disease course, after a median of 4 years of disease. Most often the radiograph showed a global narrowing of the coxofemoral space without osteophytes. One third of the patients required TJR, resulting in good functional outcomes. Intra-articular corticosteroid injections were used in 24 (49%) patients and TNF-α inhibitors were prescribed at least once in 44 (90%) patients with hip involvement.

This study has weaknesses; there may be a selection bias since all patients contacted were from a unique centre and agreed to participate, leading to recruitment of specific patients, perhaps more severe. Indeed, a high number (161 patients, 59%) were on TNF-α inhibitors. Furthermore, the date of first hip pain was based on patient recall. However, this study also has strengths; patients were not selected on the basis of severity or other criteria; patient recall was confirmed whenever possible by the patient medical file, a detailed questionnaire was filled in through direct interview, and a relatively important number of patients was analysed (275 in total) including all subtypes of SpA.

The prevalence of hip involvement was in agreement with published studies (3); van der Cruyssen *et al*. found hip involvement to be a common manifestation in ankylosing spondylitis (24–36%) (9). Overall, these patients had a worse BASFI score compared to patients without hip involvement. However, in the present study, all subtypes of SpA patients showed a trend for worse BASFI, but not reaching significance (p=0.65). Moreover, in that study, hip joint replacement was found most frequently with early disease onset and axial disease (9), which we confirm in the present study.

In the present study, hip involvement concerned more often men and juvenile onset, as previously reported (6, 8, 9, 16). Ethnic difference was significant in the present study, and North Africans had hip involvement significantly more often than Caucasians (p=0.014). This confirms previous studies (17). Since North Africans share the same genotype as Caucasians (in particular the B27 genotype), and since hip involvement is a marker of severity of SpA, these data suggest that environmental factors might play an important role in the natural history of the disease (18). Clinically, there was no association with heel pain, anterior chest wall pain, psoriasis or inflammatory bowel disease but more peripheral arthritis in hip-involvement patients, as already described in other studies (19, 20). This suggests that hip involvement could be classified both as peripheral arthritis, with consequently more peripheral arthritis in other joints than hip joints, or as axial disease, because hip involvement was also associated with bamboo spine.

Interesting data were found regarding the natural history of patients with hip involvement. Indeed, in this subgroup with hip involvement, the median age at SpA diagnosis was younger (24 years *versus* 32 years, respectively), confirming other studies (3, 9, 16). Moreover, in the present study, hip involvement appeared during the first 4 years of the disease in half the cases, therefore these patients need to be carefully monitored in the first years to be able to propose adequate treatment as soon as possible.

Recently, to assess hip involvement in SpA patients, magnetic resonance imaging of the hip has shown its use and could be performed as a screening exam to detect as early as possible potential coxofemoral synovial effusion or inflammation, in case of symptoms, if ultrasound is negative. However, in the present study, we could not report magnetic resonance imaging results, since it was rarely performed (21, 22).

Sacroilitis on radiographs tended to be more frequent in patients with hip involvement, probably because of more severe disease, as was the more frequent use of TNF-α inhibitors. As also found by Amor *et al*. (4), hip involvement appeared to be a severity criterion. Indeed, it was associated (in univariate analyses) with bamboo spine (9, 23) and TNF-α inhibitors treatments. However, surprisingly, there was no association with high BASFI scores (9), possibly because of high recourse to TJR.

Concerning TJR, as previously published (24-26), the outcome was usually good and the prosthesis was well tolerated without high frequencies for joint replacement. Even though 90% of our SpA population with hip involvement was treated with TNF-α inhibitors (more than in Van der Cruyssen's study [9]), such treatment was usually not started specifically for the hip and consequently, rather after the first hip symptoms. Therefore, this study suggests that TNF blockers are not able to interfere with the natural history of coxitis after its occurrence. Other studies are needed in order to evaluate the possibility of TNF blockers to prevent coxitis in SpA. For corticosteroid intra-articular injections, results were also disappointing, possibly because patients were often injected too late in the process of hip involvement.

In conclusion, hip involvement in the new millennium is still a frequent and severe manifestation of SpA. Future studies will show us if its prevalence decreases with increasing access to biologics.

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