

Heel pain in spondyloarthritis: results of a cross-sectional study of 275 patients

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Abstract

Objectives

Heel pain is a common but poorly studied feature of spondyloarthritis (SpA). The aims of this study were to assess the prevalence and clinical features of heel pain in a cohort of patients with SpA.

Methods

This was a retrospective single centre observational study in 2010. Patients with SpA as defined by Amor's criteria were recruited. The data collected were: demographic and disease characteristics, history of heel pain, age at first heel pain, localisation, nature and intensity of pain and treatments. The analyses were descriptive.

Results

A total of 275 SpA patients (mean age 44.6 ± 13.5 yrs, mean disease duration 16.7 ± 11.8 yrs, 61.5% men) were assessed. A history of heel pain was reported in 130 patients (47.1%), and was the first symptom of SpA in 15.7% of all patients. Heel pain was frequent in both axial (89/201, 44.3%) and peripheral disease (27/56, 48.2%). Distribution was more frequently inferior (88, 69.3%) than posterior (61, 48.0%) ($p < 0.0001$), and frequently bilateral: simultaneously (41.9%) rather than alternatively (29.1%) ($p = 0.03$). Main clinical symptoms were: morning pain on weight bearing (83.6%), but also night pain (34.4%), and/or patient-described swelling (24.2%). Heel pain was frequently recurrent (74.2%), intense (70.3%), source of a limp (71.6%), and often resistant to non-steroidal anti-inflammatory drugs (NSAIDs) (54/108, 50%). Tumour necrosis factor blockers were efficacious on heel pain in 72/94 (76.6%) of cases.

Conclusion

This study confirmed heel pain as a frequent symptom in both axial and peripheral SpA. It occurred early in the disease course and it was frequently recurrent and resistant to NSAIDs.

Key words

spondyloarthritis, heel pain, enthesitis, clinical characteristics, epidemiology

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Introduction

Heel pain is the key clinical feature of enthesitis, a hallmark of spondyloarthritis (SpA) (1). In available epidemiologic data, the prevalence of heel pain ranges from 8 to 75% of SpA patients but results from relatively small cohorts, has often been mixed with that of peripheral enthesitis, and varies according to SpA subtype (2-9). Therefore, the exact frequency of heel pain in SpA remains to be clarified.

In some studies, heel pain appeared to be the only symptom of SpA for several years before the diagnosis, which may lead to errors in diagnosis (2, 7, 8, 10-12). However, the delay between first heel pain and other SpA symptoms has to be confirmed.

The clinical course, pattern of heel pain distribution, as well as the intensity and clinical features associated with SpA-related heel pain have been little studied and derive from small studies (3, 7, 8, 10). Furthermore, the efficacy of non-steroidal anti-inflammatory drugs (NSAIDs) and local treatments is unclear. The effectiveness of tumour necrosis factor (TNF)-blockers in refractory SpA has recently been reported (13). However, there are limited data on the frequency of use of TNF-blockers and their efficacy in the management of SpA-related heel pain in daily practice.

The aims of this study were:

1. to assess the prevalence of heel pain amongst a cohort of SpA patients and its appearance over time;
2. to analyse the characteristics of heel pain including localisation, nature, intensity, distribution, and the different treatment modalities;
3. to identify the clinical characteristics associated with heel pain.

Materials and methods

Study Design

A cross-sectional retrospective observational study, COSPA (COchin SPondyloArthritis), was performed between November 2009 and July 2010, in one tertiary referral centre (Cochin hospital, Paris, France). 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", "spondyloarthropathy" or "psoriatic arthritis". All patients living in Paris or in the Paris suburbs and seen in our department in the last four years were selected, if they fulfilled Amor's criteria (Fig. 1).

Data collection

Data were collected based on a face-to-face interview completed with medical files and included age, sex, disease duration, SpA subtype (axial, peripheral, enthesitic or extra-articular), exact diagnosis (ankylosing spondylitis, reactive arthritis, chronic inflammatory bowel disease with arthropathy, psoriatic arthritis, undifferentiated SpA or juvenile SpA), HLA B27 status, radiographic sacroiliitis according to the modified New York criteria and treatments.

Prevalence of heel pain

Heel pain was patient-reported and/or based on medical files. A positive history of heel pain was taken into consideration if at least one episode of heel pain had occurred during the disease course, and considered by the investigator to be related to SpA. The following features were recorded: date of appearance, recurrences and if so, frequency, number, mean duration of episodes and mean duration of longest episode.

Characteristics of heel pain

Clinical features documented were: localisation of heel pain (e.g. posterior, inferior, or both), distribution (bilateral simultaneously or alternatively), intensity (moderate, intense, very intense), nature of symptoms (patient-reported swelling at the inferior or posterior part of the heel, night pain, morning pain on weight bearing, continuous pain) and the occurrence of a limp. A history of uveitis, inflammatory bowel disease, psoriasis, anterior chest wall pain, dactylitis, peripheral arthritis, hip involvement at any time point was also collected.

Treatments

Local and systemic treatments with their patient-reported efficacy were documented.

Competing interests: none declared.

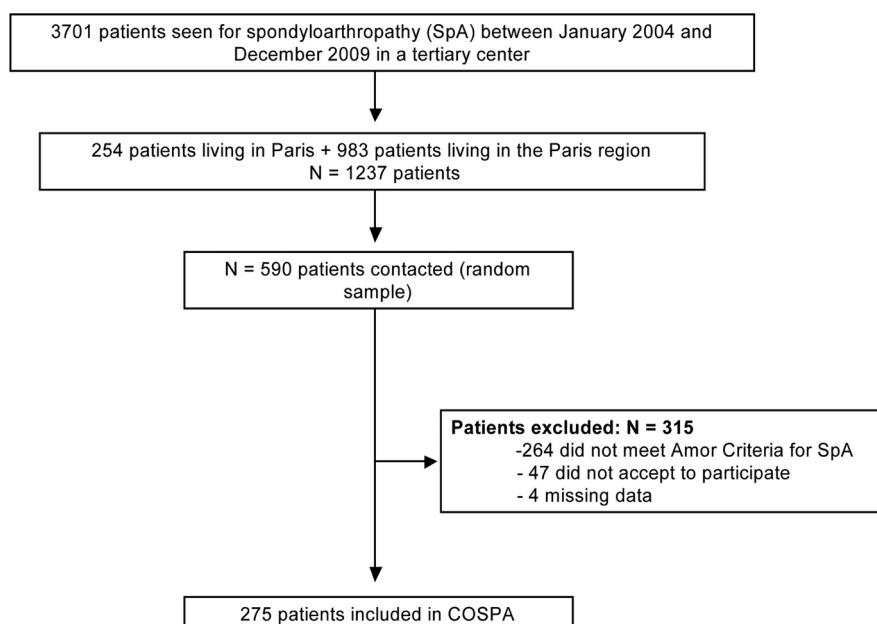


Fig. 1. Flow chart of patient selection in the COSPA study, to collect data on patients with spondyloarthropathy during a direct interview in a tertiary rheumatology centre.

Analyses were performed using the SAS statistical software version 9.1.

Results

In all, 1237 patients were selected; a random sample of 590 were contacted and 275 patients were included (Fig. 1).

Study population

Of the 275 enrolled patients, 169 (61.5%) were men, and the mean age was 44.6 ± 13.5 years (Table I).

Prevalence of heel pain among patients with SpA over time

In our cohort, 130 (47.1%) patients experienced at least one heel pain episode. Heel pain was first experienced before or at SpA diagnosis in 71 patients (54.6% of patients with heel pain and 25.8% of all patients), and was the first manifestation of SpA in 42/123 patients (34.1% of patients with heel pain, and 15.7% of all patients). The incidence of first heel pain was highest in the first years of SpA (Fig. 2). Kaplan-Meier technique estimated the incidence of heel enthesitis at $26.5 \pm 2.7\%$ at the time of diagnosis, $35.8 \pm 3\%$ 5 years after diagnosis, $43.2 \pm 3.3\%$ 10 years after diagnosis.

Statistical analysis

Prevalence was defined as the number of patients with at least one episode of heel pain during the course of SpA, over the total number of SpA patients. Prevalence of heel pain over time was estimated using Kaplan-Meier technique.

Log-rank analysis was conducted in order to identify clinical characteristics associated with heel enthesitis. All the characteristics with p -value < 0.2 in univariate analysis were entered in a multivariate Cox analysis. P -values ≤ 0.05 were considered statistically significant.

Table I. Characteristics of 275 SpA patients included in the COSPA study and clinical characteristics associated with heel pain.

	All patients (n=275)	Patients with heel pain (n=130)	Patients without heel pain (n=145)	Multivariate Cox analysis p -value*
Age, years (mean, SD)	44.6 (13.5)	43.1 (13.1)	45.9 (13.8)	0.616
Disease duration, years (mean, SD)	16.7 (11.8)	16.9 (12)	16.4 (11.6)	0.026**
Age at first symptom (mean, SD)	28.0 (12.5)	26.3 (12.1)	29.6 (12.6)	
Male gender (n, %)	169 (61.5)	86 (66.1)	83 (57.2)	
HLA-B27 (n, %)	199 (79.3)	96 (80.7)	103 (78.0)	
SpA sub-type				
axial (n, %)	201 (73.1)	89 (68.5)	112 (77.2)	0.373
peripheral (n, %)	56 (20.3)	27 (20.8)	29 (20.0)	
enthesitis (n, %)	12 (4.4)	11 (8.5)	1 (0.7)	0.005***
extra-articular (n, %)	2 (0.7)	1 (0.8)	1 (0.7)	
undifferentiated SpA (n, %)	4 (1.4)	2 (1.5)	2 (1.4)	
Juvenile-onset SpA, (n, %)	9 (3.3)	30 (23.1)	14 (9.7)	0.201
Dactylitis, (n, %)	59 (21.4)	39 (30.0)	20 (13.8)	0.086
Peripheral arthritis (n, %)	127 (46.2)	74 (56.9)	53 (36.5)	0.012**
Hip involvement (n, %)	49 (17.8)	24 (18.5)	25 (17.2)	
Extra-articular (psoriasis and/or uveitis and/or IBD)	169 (61.4)	88 (67.7)	81 (55.9)	
psoriasis (n, %)	84 (30.5)	43 (33.1)	41 (28.3)	
uveitis (n, %)	77 (28.0)	43 (33.1)	34 (23.4)	
IBD (n, %)	44 (16)	25 (19.2)	19 (13.1)	
Anterior chest wall pain (n, %)	102 (37.1)	58 (44.6)	44 (30.3)	0.002***
Radiographic sacroiliitis (n, %)	190 (74.5)	88 (72.1)	102 (76.7)	
Inflammatory lumbar pain (n, %)	220 (80.6)	105 (80.8)	115 (80.4)	
Anti-TNF therapy (n, %)	161 (58.5)	84 (64.6)	77 (53.1)	

* p -values provided by Cox analysis assessing the risk of developing heel enthesitis over time. ** $p < 0.05$. *** $p < 0.01$. SD: standard deviation.

nosis and $54.7 \pm 4\%$ 20 years diagnosis. When heel pain was the first symptom, the mean duration between first heel pain and the diagnosis of SpA was 4.2 (± 5.3) years (1.28).

Clinical characteristics of heel pain

– Course of heel pain

The mean duration of heel pain episodes was $5.4 (\pm 14.1)$ weeks (0.2; 70), and the mean duration of the longest heel pain episode was $14.4 (\pm 33.6)$ weeks (0.3; 200). Recurrences were experienced by 92/124 (74.2%) patients. In these patients, the mean number of episodes per patient was $15.0 (\pm 20)$ (1; 85).

– Localisation

Heel pain was more frequently observed at the inferior than posterior part of the heel (69.3% vs. 48.0%, $p < 0.0001$). Some patients experienced both inferior and posterior heel pain. Heel pain was more frequently bilateral (92/126, 73.0%) than unilateral (34/126, 27.0%), and simultaneously bilateral (49/117 patients with heel pain and complete data, 41.9%) more frequently than alternatively (34/117, 29.1%) ($p = 0.03$). Heel pain was intense or very intense in 70.3% patients. Local symptoms included: morning pain on weight bearing (83.6%), continuous pain (64.0%), night pain (34.4%), patient-reported swelling (24.2%), and a limp (71.6%).

Treatments

The most frequently reported local treatments were: orthoses (34.6%), local NSAID application (26.9%), and glucocorticoid injections (10.7%). Oral NSAIDs were reported to be inefficient on heel pain in 50% of patients (54/108). TNF-blockers were prescribed in a total of 84 (64.6%) patients, mainly for other indications, except for 3 patients for whom they were specifically used for resistant heel enthesitis: 42 (32.3%) received etanercept, 34 (26.2%) infliximab, and 34 (26.2%) adalimumab. The patient-reported efficacy of each treatment is reported in Table II.

Clinical characteristics

associated with heel pain (Table I)

Heel pain was observed in all SpA subtypes. In univariate analysis, heel pain was associated with a history of

Appearance of heel pain according to time of SpA diagnosis

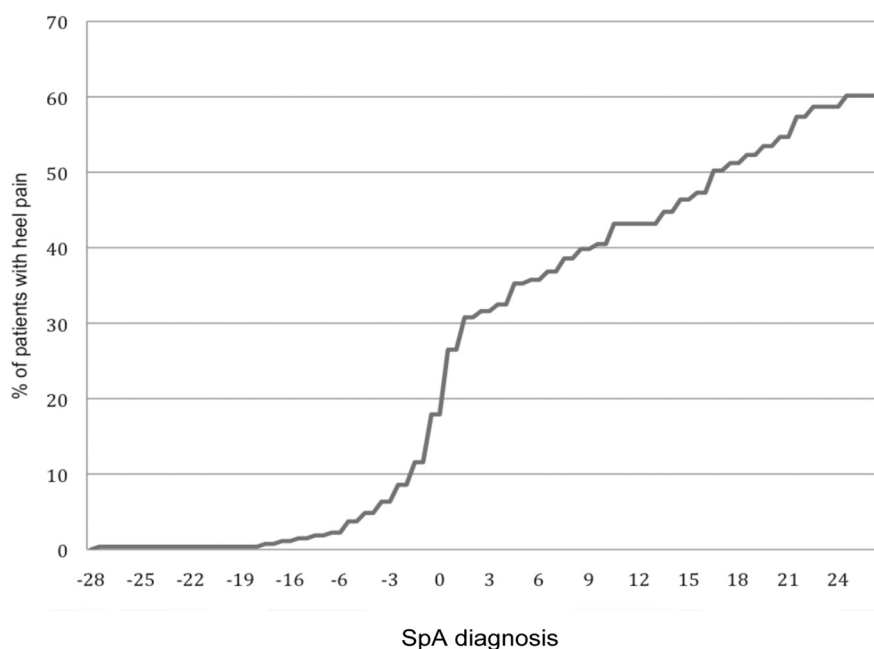


Fig. 2. Percentage of patients with heel pain according to time (Kaplan-Meier survival technique): X axis: years of follow-up from diagnosis; Y axis: percentage of patients with heel pain.

Table II. Local and systemic treatments and their patient-reported efficacy on heel pain in 130 patients.

Treatments	Analysed data	Patient-reported efficacy in 130 patients with heel pain n (% of analysed data)
Local treatments		
Local NSAID application (n=35)	35	6 (17.1)
Orthoses (n=45)	45	
effective or very effective		22 (48.9)
Shock wave therapy (n=6)	6	
effective or very effective		1 (16.7)
Glucocorticoid injections (n=14)	14	
effective or very effective		9 (64.3)
Oral or systemic treatments		
Oral NSAIDs (n=130)	108	54 (50.0)
TNF blockers		
Infliximab (n=34)	28	
effective or very effective		24 (85.7)
Adalimumab (n=34)	29	
effective or very effective		20 (69.0)
Etanercept (n=42)	37	
effective or very effective		28 (75.7)

anterior chest wall pain ($p = 0.001$), peripheral arthritis ($p = 0.003$), dactylitis ($p = 0.005$), axial SpA ($p = 0.043$), enthesitic subtype of disease ($p = 0.0004$), and with disease duration ($p = 0.006$). In Cox multivariate regression analysis, anterior chest wall pain (hazard ratio [HR], 2.17 [95% confidence interval, CI 1.33–3.56], $p = 0.002$), and peripheral arthritis (HR, 2.07 [95% CI 1.18–3.65],

$p = 0.012$) were independently associated with heel pain. Disease duration was inversely associated with the occurrence of heel pain (HR, 0.96 [95% CI 0.93–1.00], $p = 0.026$).

Discussion

To date, this is the largest study, in a single cohort, investigating the clinical course and detailed characteristics of

SpA-related heel pain. Heel pain was frequently observed in both axial and peripheral SpA, with an overall prevalence of 47.1%. This result is consistent with frequencies reported in previous smaller studies (2-5, 7, 8), and with two recent early SpA cohorts GESPIC and DESIR (14, 15).

This study supports the idea that heel enthesitis is a strong feature of early SpA since a) heel pain was frequently the first symptom of disease, consistent with earlier studies (2, 7, 8, 10, 11); b) the highest incidence rate of first heel pain was observed in the first years of SpA; and c) the mean delay between first heel pain and diagnosis was more than 4 years, which confirms that heel pain can remain the only symptom of SpA for several years (12).

This study highlights the patient-perceived burden of heel pain and the fact that heel pain remains a main source of patient discomfort in SpA, as illustrated by the high number of recurrences, the intensity of pain and the frequency of a limp, key features reported by more than 70% of patients, and also the frequent resistance to NSAIDs (in 50% of patients) (7, 8, 10).

Some limitations need to be considered. Firstly, the retrospective design may have led to a memorisation bias. Secondly, this study was performed in a tertiary rheumatology centre, with potentially more severe cases of SpA,

and a high proportion of patients receiving TNF blockers, which may not reflect SpA population in general.

In conclusion, the present study brings clinically relevant knowledge on heel pain in SpA, which may help physicians in the early diagnosis of this manifestation. Recent advances in terms of imaging and treatment by biologics should allow in the future a better understanding and treatment of this potentially disabling feature of SpA.

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