

Prevalence and clinical characteristics of dactylitis in spondylarthritis: a descriptive analysis of 275 patients

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Abstract

Objectives

Dactylitis is a common but little studied feature of spondylarthritis (SpA). Our objective was to assess the prevalence of dactylitis among a cohort of patients with spondylarthritis in a tertiary care centre and to describe the clinical characteristics of dactylitis.

Method

This was a prospective single centre observational study carried out in 2010. The patients included had been diagnosed as having definite SpA based on Amor's criteria. Each patient was interviewed by a physician. The data collected included prevalence of dactylitis and its clinical characteristics, effectiveness of the different treatments, and association with severe manifestations of SpA, and analysed by descriptive analysis.

Results

275 consecutive SpA patients were assessed: mean age 43.2±13.5 years, mean disease duration 14.0±11.8 years, 169 (61.4%) were men. In all, 59 patients (21.5%) suffered from SpA-associated dactylitis. The localisation of dactylitis was toes in 46 patients (78.0%) and/or fingers in 25 patients (42.4%). The most frequent localisations were the second toe and the second finger. Dactylitis was the first symptom of SpA in 14 patients (5.1%), and 28.8% (n=17) of dactylitis appeared within the first 5 years of disease. Dactylitis was present in 35.1% (n=13) of patients with undifferentiated SpA and in 30.6% (n=15) of patients with psoriatic arthritis. It was significantly associated with history of peripheral arthritis or heel pain. In our population, there was no correlation between dactylitis and HLA B27 status or sex and it was not a marker of severity of disease.

Conclusion

Dactylitis is a frequent manifestation in SpA (21.5%) particularly in peripheral disease and it may be the first manifestation of the disease with localisation being more frequent in the toes.

Key words

spondylarthritis, dactylitis, clinical characteristics

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Introduction

Spondylarthritis (SpA) is a heterogeneous group of diseases which is characterised by axial, peripheral and extra articular manifestations (1). Dactylitis, also known as ‘sausage-like’ digits, is one of the manifestations of SpA and is defined by Rotschild as “uniform swelling such that the soft tissues between the metacarpophalangeal and proximal interphalangeal, proximal and distal interphalangeal, and/or distal interphalangeal joint and digital tuft are diffusely swollen to the extent that the actual joint swelling can no longer be independently recognised” (2). Flexor tenosynovitis together with the peritendinous soft tissue oedema seem to be the *sine qua non* condition for the development of the ‘sausage-like’ appearance (3). Joint synovitis is often present but cannot give the ‘sausage-shaped’ digit without the simultaneous presence of tenosynovitis and soft tissue oedema. Physical examination shows swelling and pain mostly along the flexor tendons (4).

Dactylitis is considered so specific of SpA and psoriatic arthritis that it was included in several criteria sets, such as Amor’s criteria (5) or more recently, the psoriatic arthritis classification criteria generated by the CASPAR (Classification criteria for Psoriatic ARthritis) Study Group (6). Dactylitis is present in all forms of SpA (*i.e.* axial SpA, undifferentiated disease, psoriatic arthritis, SpA associated with inflammatory bowel disease (IBD), juvenile SpA, or reactive arthritis) but its prevalence is unclear. In psoriatic arthritis, the prevalence has been reported as 16 to 52% (7, 8-10), but in the other subtypes of SpA, there are few data (2, 11, 12).

Like other manifestations of SpA, dactylitis may sometimes occur for a long time in isolation as the only clinical manifestation of the HLA-B27-associated disease process (3). In such cases, the diagnosis of dactylitis may sometimes be difficult, and misdiagnosis may occur with other diseases such as gout or sarcoidosis (2). It would be helpful to have a better knowledge of the clinical characteristics of dactylitis, including the time of appearance in the disease duration, and preferential

localisations. Although classically, the preferred localisation is said to be the toes, there are little data supporting this (13, 11).

Regarding the treatment of dactylitis, some randomised controlled trials showed efficacy of biologics to treat dactylitis in populations of psoriatic arthritis, but this was not shown in populations of SpA (8, 14). Moreover, it should be considered that patients from clinical trials and patients from clinical care differ significantly, therefore data on the treatment of dactylitis in real life would be useful (15).

Dactylitis seems to be a marker of poor local prognosis in psoriatic arthritis (13) and has also sometimes been considered a predictive factor of severity in SpA (11, 16).

The present study had as objectives to describe (a) the prevalence of dactylitis in SpA and according to the SpA subtype, (b) time of appearance in the disease course, (c) its clinical characteristics and associations with other SpA manifestations, (d) treatments performed and (e) we endeavoured also to determine if presence of dactylitis was a severity criterion for SpA.

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 center. 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 “spondylarthritis”, “spondylarthropathy” or “psoriatic arthritis”. All patients living in Paris or in the suburb of Paris and seen in our department in the last four years were selected, if they fulfilled Amor’s criteria (5), ASAS axial or peripheral SpA criteria (17) or CASPAR criteria (6). In all, 1237 patients were selected; a random sample of 590 were contacted (Fig. 1).

General data collection

General data collected were age, sex,

Competing interests: none declared.

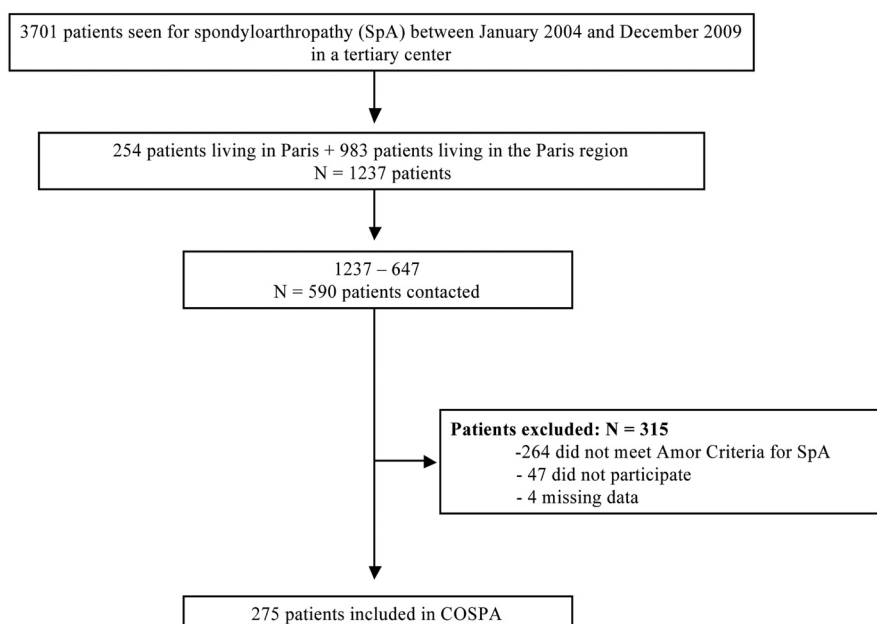


Fig. 1. Flow chart of patient selection in the COSPA study, to collect data on patients with spondyloarthropathy during a direct interview in a tertiary rheumatology centre.

disease duration, SpA subtype (axial, peripheral, enthesitis or extra-articular), exact diagnosis (ankylosing spondylitis, reactive arthritis, chronic inflammatory bowel disease with arthropathy, psoriatic arthritis, undifferentiated spondylarthropathy or juvenile spondylarthritis), HLA B27 status, C-reactive protein rate at diagnosis, radiographic sacroiliitis according to modified New York criteria (18) and treatments.

Dactylitis: data collection and interpretation

Data were collected with face-to-face interviews completed with medical files. The interviews were conducted by 8 residents.

Dactylitis was defined as patient-reported or physician report (in the medical file) of a swollen digit, considered in the file to be dactylitis and to be related to SpA. Prevalence and clinical characteristics of dactylitis were collected: date of appearance, pattern of joint involvement, intensity of pain, duration of episode, imaging investigations performed, specific or general treatments performed with their patient-reported efficacy.

Comparisons between patients with and without dactylitis were performed, concerning demographic characteristics, SpA subtype, other manifestations of SpA and disease duration.

Statistical analyses

Prevalence was defined as the number of patients with at least one episode of dactylitis during their disease, over the total number of patients. Descriptive statistics were used for characteristics of the pain, imaging and treatments. Continuous variables were given as mean values ($\pm$ Standard Deviation, SD). Time of appearance of the manifestation was analysed with Kaplan Meyer survival technique.

To compare SpA patients with *versus* without dactylitis, semi-parametric tests (log rank/cox) were applied. To take into account that this manifestation is related to disease duration, all patients with dactylitis were compared to a subgroup of patients without dactylitis. Indeed, only those patients without dactylitis but with disease duration at least equal to the median duration before appearance of dactylitis (*i.e.* 14.0 years) were analysed. *P*-values ≤ 0.05 were considered significant. Analyses were performed using the SAS statistical software version 9.1.

Results

Patients

A total of 275 patients were included in our study (Fig. 1); mean $\pm$ SD age was 43.2 $\pm$ 13.5 years at the time of inclusion in the study; mean $\pm$ SD disease duration

was 14.0 $\pm$ 11.8 years. In all, 169 were men (61.4%). Among these 275 patients, 190 (69.1%) had axial SpA, 49 (17.8%) had psoriatic arthritis, 37 (13.4%) had undifferentiated SpA, 23 (8.4%) had SpA associated with IBD, 9 (3.3%) had juvenile SpA and 5 (1.8%) had reactive arthritis. In all, 199 (79.3%) of patients presented HLA B27, 161 (58.5%) were treated in their disease duration with a TNF blocker and 49 (17.8%) had a total joint replacement.

Prevalence of dactylitis

Among the 275 patients, 59 patients (21.5%) had at least one episode of dactylitis during their disease. Dactylitis was an inaugural manifestation of SpA in 14 patients, which corresponds to 5.1% of all patients and 23.7% of patients with dactylitis. It was an inaugural symptom in 4/190 (2.1%) in axial SpA, 5/49 (10.2%) in psoriatic arthritis and 5/37 (13.5%) in undifferentiated SpA. Thirty patients (10.9% of all patients and 50.8% of patients with dactylitis) had their first episode of dactylitis before the diagnosis of SpA was made or in the first year after the diagnosis, the other patients had dactylitis in the first 5 years ($n=17$; 28.8%), between 5 and 10 years ($n=3$; 5.1%), or more than 10 years after the diagnosis ($n=8$; 13.6%) (Fig. 2). For patients having a first episode of dactylitis after their diagnosis, the first episode of dactylitis appeared in average 8.8 $\pm$ 10.3 years after the diagnosis of SpA. The prevalence varied with the subtype of SpA (Table I): higher prevalences were observed in undifferentiated SpA (13/37, 35.1%) and in psoriatic arthritis (15/49, 30.6%) than in axial SpA (29/190, 15.3%).

Clinical characteristics of dactylitis localisation

Dactylitis involved toes, at least once, in 46 patients of the 59 patients with dactylitis (78.0%) and fingers in 25 patients (42.4%). Only toes were involved in 33 patients (55.9%) and only fingers in 14 patients (23.7%). Twenty-four patients (40.7% of patients with dactylitis) presented dactylitis of only one digit, whereas the others ($n=35$) had multiple digits involved in their disease course. Mean $\pm$ SD number of

Table I. Clinical characteristics of patients with and without dactylitis.

		All patients n=275	Patients with at least one episode of dactylitis n=59	Patients without dactylitis n=216	p-value*
General characteristics	Male, n (%)	169 (61.4)	35 (59.3)	134 (62.0)	0.526
	Disease duration, years, mean (SD)	14.0 (11.8)	17.0 (11.4)	16.6 (11.9)	0.021
	Age, years, mean (SD)	43.2 (13.5)	44.8 (13.4)	44.5 (13.6)	0.312
	Age at beginning of symptoms, mean (SD)	25 (12.5)	28.1 (12.7)	28.0 (12.4)	0.247
	Age at diagnosis, mean (SD)	30 (13.1)	31.5 (12.9)	33.2 (13.1)	0.957
	Family history, n (%)	116 (42.2)	29 (49.1)	87 (78.1)	0.441
	HLA B27, n/n (%)	199/251 (79.3)	43/55 (78.2)	156/196 (79.6)	0.848
Main diagnosis	Axial spondylarthritis, n (%)	190 (69.1)	29 (49.1)	161 (74.5)	0.002
	Psoriatic arthritis, n (%)	49 (17.8)	15 (25.4)	34 (15.6)	0.110
	Undifferentiated spondylarthritis, n (%)	37 (13.4)	13 (22.0)	24 (11.1)	0.007
	Spondylarthritis associated with IBD, n (%)	23 (8.4)	5 (8.5)	18 (8.3)	0.291
	Juvenile arthritis, n (%)	9 (3.3)	1 (1.7)	8 (3.7)	0.614
	Reactive arthritis, n (%)	5 (1.8)	4 (6.8)	1 (0.5)	0.002
Associated symptoms	Uveitis, n (%)	77 (28.0)	18 (30.5)	59 (27.3)	0.442
	Peripheral arthritis, n (%)	127 (46.2)	45 (76.3)	82 (38.0)	<0.001
	Psoriasis, n (%)	84 (30.5)	24 (40.7)	60 (27.8)	0.707
	Heel pain, n (%)	130 (47.3)	39 (66.1)	91 (42.1)	0.016
	Chest pain, n (%)	102 (37.1)	22 (37.3)	80 (37.0)	0.761
	Radiologic sacro iliitis, n/n (%)	190/255 (74.5)	35/51 (68.6)	155/204 (76.0)	0.715
	C reactive protein > 5mg/l at diagnosis, n/n (%)	175/246 (71.1)	39/52 (75.0)	136/194 (70.1)	0.930

*p-value comparing patients with vs. without dactylitis by semi-parametric tests.

involved digits in one patient was 3.0 ±2.6.

Symptoms

Pain related to dactylitis was most often described as intense (64.0% of cases) and occurred during the night in 50.0% of cases. Mean duration of the longest episode of dactylitis was 9.5±14.8 weeks.

Imaging

Complementary investigations were carried out to explore dactylitis in 29 patients (64.4% of available data); x-ray in 25 patients (55.6%), ultrasonography in 10 patients (22.2%) and magnetic resonance imaging in 2 patients (4.4%) with dactylitis.

Treatments

In all, 17 patients (29.3%) were locally treated with a corticosteroid injection. Disease modifying antirheumatic drugs (DMARDs) and biologics were respectively reported as having excellent efficacy in 12.9% (4/31 treated by DMARDs) and 52.9% (18/34 treated by biologics), good efficacy in 38.7% (n/n=12/31) and 29.4% (n/n = 10/34), poor efficacy in 48.4% (n/n=15/31) and 17.6% (n/n = 6/34).

Dactylitis as a severity criterion:

Comparison of patients with vs. without dactylitis

Patients with dactylitis were not different from the whole population concerning disease duration, age, age at the beginning of symptoms, age at diagnosis, family history of SpA and HLA B27 status. However, some manifestations like peripheral arthritis ($p<0.001$) or heel pain ($p=0.016$) were more often present in patients with dactylitis than in the general population of SpA (Table I).

Correlation between dactylitis and criteria of severity of SpA

Dactylitis was not significantly associated with the presence of severity criteria (data not shown).

Discussion

In the present study, dactylitis was a frequent manifestation of SpA, present in 21.5% of patients over their disease duration. It was more frequent in undifferentiated SpA and less frequent in axial SpA. Dactylitis was an early manifestation of the disease, with a first episode before or within the first year after the diagnosis of SpA for 30 patients (10.9% of the whole population and 50.8% of those with dactylitis).

Toes were more frequently involved than fingers and the most frequent localisation was the second digit. A history of peripheral arthritis or heel pain was more frequently associated with presence of dactylitis, however dactylitis was not found to be associated with severity.

This study has weaknesses and strengths. Weaknesses include the selection of patients coming from a tertiary referral centre; they may not be representative of the general population of SpA and include more severe SpA. Indeed, biologics were prescribed in 161 of the 275 patients (58.5%). However, the demographic characteristics of our population are in keeping with usual SpA populations (19). Moreover, this was a retrospective study, based on retrospective reporting of dactylitis; consequently, we cannot exclude a memorisation bias. But, interviews were performed by a physician, with the help of medical files and patients were often followed up in the centre since the beginning of the disease, so most of features were mentioned in the files. Furthermore, the present study population was not specifically selected; all patients who fulfilled the criteria of SpA and who accepted the interview were included.

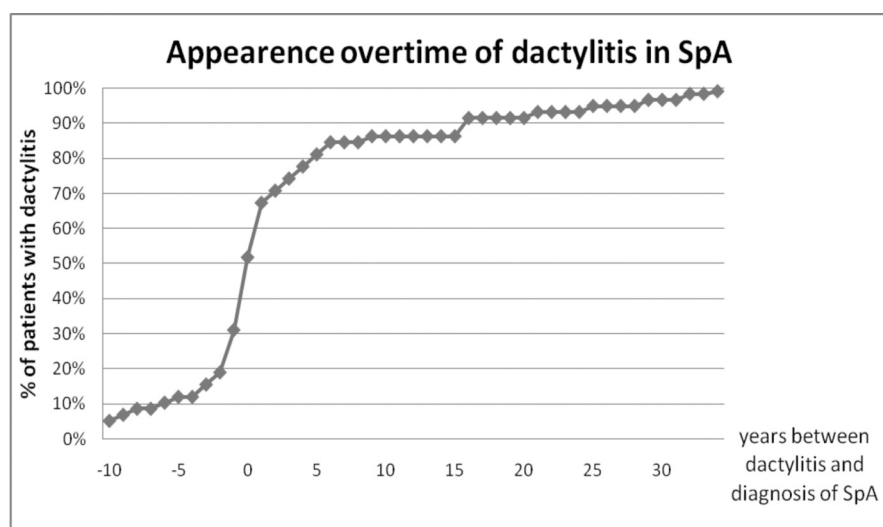


Fig. 2. Appearance overtime of dactylitis in SpA.

Years	-10	-5	0	5	10	15	20	25	30
Number of patients exposed to risk	58	51	28	11	8	8	5	3	2

All these patients were followed up in a unique medical centre, so medical care was quite homogeneous.

The high prevalence of dactylitis (21.5%) in the present study may have several explanations. In other studies (150 to 271 patients), prevalence of dactylitis in SpA varied from 4 to 23.6% (2, 11, 12). On the one hand, the prevalence can be overestimated in comparison to other studies, because of the long follow-up of patients in this study (mean disease duration is 14 years). On the other hand, we did not confirm the clinical diagnosis of dactylitis with a measure instrument like the Leeds dactylitis index (20), but in the present study, dactylitis was not present when the patient was interviewed, rather in the history of the patient, so using this index was not possible. Prevalence was higher in undifferentiated SpA (35.1%) and in psoriatic arthritis (30.6%) than in axial disease. This confirms the validity of our results, since dactylitis has long been recognised as one of the cardinal features of psoriatic arthritis (7, 8-10). Here, dactylitis was frequently associated with peripheral arthritis, as also found in another study (12). This can be explained by the physiopathology of this feature. Dactylitis is predominantly due to swelling and inflammation in the flexor tendon sheaths, in addition

of varied proportion of joint synovitis (20, 4). Other authors hypothesised that flexor tenosynovitis was due to enthesitis, as a consequence of the diffusion of cytokines along the tenosynovial sheaths (21). This phenomena can also explain the frequent association between heel pain and dactylitis, which was found here. Moreover, the presence of dactylitis and heel pain in combination is high specific of SpA (11).

Dactylitis was an inaugural manifestation of SpA in 5.1% of all patients. Previous reports found heterogeneous figures (1.8% to 10%) in different sample-size studies (150 to 1385 patients) (22, 23). Dactylitis can appear before other symptoms of SpA. Here, in 18 patients (31.0%) the first episode of dactylitis appeared before the diagnosis of SpA was made. Six years after the diagnosis, 84.4% of patients with dactylitis had their first episode. Thus, dactylitis is an early symptom of the disease and should be recognised in order to diagnose SpA early.

We confirmed here that toes are more involved (78.0%) than fingers (42.4%) in dactylitis, and that the most frequent localisation was the second digit. Another study in a population of psoriatic arthritis obtained similar results (13); in SpA however, these data were unknown. These data confirm the importance of

assessing the feet in SpA, in particular in peripheral or undifferentiated forms, especially as involvement of the fore-foot is a factor of poor prognosis (11).

In Brockbrank *et al.*'s study of psoriatic arthritis, radiological damages were more often observed in digits affected by dactylitis than in unaffected digits (13). This aspect was not addressed in the present study. Other studies also suggested that dactylitis may be a severity marker of SpA (11, 16). Here, we did not evidence dactylitis as a prognostic factor for SpA.

Treatment of SpA is based on DMARDs and/or biologics. The ability of DMARDs, *e.g.* methotrexate, to treat enthesitis and dactylitis, and to inhibit structural damage in these manifestations has not been prospectively assessed (24). In our study, DMARDs had a reported global excellent or good efficacy on dactylitis in 51.6% of cases. But, patients may well have seen improvement without treatment as symptoms resolved spontaneously or with local injections. The results of our study also suggest the efficacy of biologics to treat dactylitis in patients with SpA (8, 14); among the 34 patients with dactylitis and treated by biologics, 82.3% (28 patients) reported an excellent or good efficacy of the treatment specifically on this symptom.

In conclusion, dactylitis is a frequent manifestation of SpA particularly in peripheral forms; better knowledge of clinical features of dactylitis may help clinicians to better diagnose and manage this manifestation. These data must be confirmed by further studies.

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