

Prevalence and characteristics associated with dactylitis in patients with early spondyloarthritis: results from the ESPeranza cohort

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Abstract

Objective

Dactylitis is a typical feature of psoriatic arthritis. However, dactylitis was included as a spondyloarthritis (SpA) feature for both (axial and peripheral) of the ASAS classification criteria, but data about its prevalence are scarce, especially in patients with a recent onset of the disease. Our objective was to determine the prevalence and characteristics associated with dactylitis in patients with early SpA.

Methods

A baseline dataset from the ESPeranza cohort was used. This programme included patients who were suspected of having SpA (age <45 years, symptoms duration of 3–24 months and with inflammatory back pain, or asymmetrical arthritis, or spinal/joint pain plus ≥ 1 of the SpA features). For this study, 609 patients who were diagnosed with SpA by their physician were included. Descriptive, univariable and multivariable logistic regression analyses were employed to investigate the association between the presence of dactylitis and the characteristics associated with SpA.

Results

Fifty-eight (9.5%) patients currently or previously had dactylitis. In the multivariable analysis, dactylitis was independently associated with peripheral arthritis (OR= 4.83; $p<0.001$), enthesitis (OR= 2.49; $p=0.01$), psoriasis (OR= 3.62; $p<0.01$) and the physician's visual analogue scale (OR= 0.82; $p=0.01$). However, 67% of the patients who had dactylitis did not have peripheral arthritis or psoriasis and 15% had predominantly axial disease.

Conclusion

Dactylitis is a frequent manifestation in patients with SpA, even during the early stages of the disease. Its presence is mainly associated with peripheral manifestations and psoriasis. Nevertheless, dactylitis is not exclusive of patients with PsA or peripheral manifestations.

Key words

dactylitis, spondyloarthritis, psoriatic arthritis

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Introduction

Spondyloarthritis (SpA) describes a group of diseases characterised by axial and/or peripheral inflammatory joint involvement, with or without the presence of extra-articular manifestations, which includes dactylitis, uveitis, inflammatory bowel disease (IBD) and psoriasis (1).

Dactylitis is frequently seen in psoriatic arthritis (PsA), but it may also be present in other forms of SpA. Dactylitis, which is also known as ‘sausage-like’ digits, is defined by Rotschild as the “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). Several diseases are included in the differential diagnosis of dactylitis. However, in the past few years, magnetic resonance imaging (MRI) and ultrasound have shown that the sausage-like digit appearance in patients with SpA is clearly different from the digit appearance of other diseases, such as tuberculous dactylitis, syphilitic dactylitis, sarcoid dactylitis, blistering distal dactylitis or sickle cell disease dactylitis (3). In the dactylitis that is seen in SpA, flexor tenosynovitis together with diffuse soft tissue oedema seems to be the sine qua non condition for the development of the ‘sausage-like’ appearance (4, 5).

In PsA, the prevalence of dactylitis has been estimated as being 16% to 52%, but the prevalence of this extra-articular manifestation in the other subtypes of SpA and during the first stages of the disease is not well established. In addition, dactylitis has been included as one of the typical features for both axial and peripheral ASAS SpA classification criteria (6, 7).

Based on this, the objective of the present study was twofold: (a) to describe the prevalence of dactylitis in patients with early SpA and in the different SpA subtypes and (b) to determine which clinical and disease characteristics are associated with dactylitis in patients with early SpA.

Materials and methods

Study design and population

This observational study was performed within the framework of the ESPeranza programme, a Spanish prospective multicentre national health programme aiming to facilitate early diagnosis of patients with SpA (8). In summary, this was a national initiative in which patients who were suspected as having early SpA were referred to 25 different centres (8, 9). The patients fulfilled the following inclusion criteria: 1) age <45 years, 2) symptom duration between 3 and 24 months, and 3) at least one of the following: a) inflammatory axial pain (defined by the presence of two of the following characteristics: insidious onset, improvement with exercise and worsening with sleep, and morning stiffness of 30 minutes), b) asymmetric arthritis, especially in the lower limbs, c) spinal pain (at any level) or joint pain, plus one of the following features of SpA: psoriasis, IBD, anterior uveitis, radiographic sacroiliitis, human leucocyte antigen B27 (HLA-B27) positivity, or a family history of SpA, psoriasis, IBD or anterior uveitis. For this specific study, the baseline data from all patients diagnosed with SpA by the local rheumatologist at each centre were analysed.

All patients signed an informed consent before their inclusion. The programme was reviewed and approved by the Research Ethics Committee of Hospital Reina Sofía in Cordoba, Spain. The approval covers the analysis of the data described in this study.

Variables

For all patients, a detailed medical history and examination were performed, and data were collected and registered using an electronic form, including gender, age and clinical SpA features: IBP characteristics, enthesitis, arthritis, dactylitis (defined as uniform swelling such that the soft tissues between the metacarpophalangeal and distal interphalangeal joint and digital tuft are diffusely swollen to the extent that the actual joint swelling can no longer be independently recognised), psoriasis, IBD, diarrhoea, urethritis, cervicitis, prostatitis, a positive family history for

SpA, and a good response to non-steroidal anti-inflammatory drugs (NSAIDs). The complementary examinations that were included are lab tests of C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), and HLA-B27, and conventional radiography of sacroiliac joints, if available. MRI was not included in the protocol as a mandatory test, but all participating centres were asked to perform it, if possible.

Statistical analysis

First, a descriptive analysis was performed to determine the number (percentage) of patients with dactylitis and to compare the characteristics between the patients with or without dactylitis. The results are shown as the mean and standard deviation (SD) for continuous variables, and they are shown as the absolute number (relative percentage) for categorical variables. The Student's *t*-test was used for continuous variables, while categorical variables were compared using the Chi-square test. Second, based on the results of the descriptive analyses, variables were selected to be included in the multivariable logistic regression model, which was performed to investigate the association between the characteristics (as the independent variable) and the presence of dactylitis (as the dependent variable). Estimates for these associations are shown as the odds ratio, and *p*-values less than 0.05 were considered to be statistically significant. SPSS (v. 20.0) was used to perform all of the analyses.

Results

In total, 609 patients who were diagnosed as SpA with the data at basal visit were included in this study. Fifty-eight (9.5%) patients currently or previously had dactylitis. Table I shows the demographic and disease characteristics for all of the included patients, separately for patients with dactylitis and patients without dactylitis. Patients with dactylitis had a higher frequency of peripheral arthritis (76% vs. 23%; $p<0.001$), enthesitis (48% vs. 18%; $p<0.001$), psoriasis (31% vs. 12.5%; $p<0.001$), nail lesions (7% vs. 2%; $p=0.01$), and swollen joint count (3.5 ± 4.2 vs. 0.4 ± 1.4 ; $p<0.001$), and they had greater values

Table I. Demographic and disease characteristics in patients with or without dactylitis.

Characteristic	No dactylitis (n=551)	Dactylitis (n=58)	<i>p</i> -value
Age (years)	33.1 $\pm$ 7.2	33.8 $\pm$ 7.4	0.5
Gender (male)	323 (58.6)	36 (62.1)	0.6
Symptom duration (months)	11.6 $\pm$ 6.6	11.9 $\pm$ 7.4	0.8
CBP	483 (87.7)	28 (48.3)	<0.001
IBP (ASAS criteria)	246 (44.6)	11 (19)	<0.001
Response to NSAIDs	330 (59.9)	29 (50)	0.2
Peripheral arthritis	125 (22.7)	44 (75.9)	<0.001
Enthesitis	101 (18.3)	28 (48.3)	<0.001
Psoriasis	69 (12.5)	19 (32.8)	<0.001
Nail lesions	10 (1.8)	4 (6.9)	0.01
IBD	32 (5.8)	1 (1.7)	0.2
Uveitis	27 (4.9)	1 (1.7)	0.3
Diarrhoea, cervicitis, urethritis	14 (2.5)	4 (6.9)	0.06
Family history of SpA	148 (26.9)	13 (22.4)	0.5
HLA-B27 positive (n=597)	254 (46.1)	23 (39.7)	0.5
CRP	8.7 $\pm$ 17.1	14.8 $\pm$ 17.1	0.01
ESR	16.5 $\pm$ 17.2	21.0 $\pm$ 20.0	0.08
SJC	0.4 $\pm$ 1.4	3.5 $\pm$ 4.2	<0.001
Physician's VAS	3.6 $\pm$ 2.1	4.6 $\pm$ 2.6	0.001
Patient's VAS	5.3 $\pm$ 2.5	5.2 $\pm$ 3.0	0.9
Radiographic sacroiliitis (n=541,56)	184 (33.4)	11 (19.0)	0.03
BASDAI	4.4 $\pm$ 2.3	4.7 $\pm$ 2.6	0.4
BASFI	2.6 $\pm$ 2.3	2.7 $\pm$ 2.2	0.6
BASMI	1.5 $\pm$ 1.2	1.3 $\pm$ 1.2	0.1

Tables show values for mean $\pm$ SD or n (%).

CBP: chronic back pain; IBP: inflammatory back pain; NSAIDs: non-steroidal anti-inflammatory drugs; IBD: inflammatory bowel disease; CRP: C-reactive protein (mg/L); ESR: erythrocyte sedimentation rate (mm/hr); SJC: swollen joint count; VAS: visual analogue scale.

of the physician's visual analogue scale (VAS) (4.6 ± 2.6 vs. 3.6 ± 2.1 ; $p=0.001$) and CRP (14.8 ± 17.1 vs. 8.7 ± 17.1 ; $p=0.01$). On the contrary, the presence of chronic low back pain (48.3% vs. 87.7%; $p<0.001$) and presence of radiographic sacroiliitis (19% vs. 33.4%; $p=0.03$) were associated with the absence of dactylitis. No significant differences were found for the rest of the variables.

The results for the multivariable analysis are presented in Table II. In this analysis, dactylitis was independently and directly associated with peripheral arthritis (OR=4.83; $p<0.001$), enthesitis (OR=2.49; $p=0.01$), and psoriasis (OR=3.62; $p<0.01$), while it was inversely associated with the physician's VAS (OR=0.82; $p=0.01$).

To investigate whether the presence of dactylitis is exclusive of patients with psoriasis or peripheral arthritis, further sensitivity analyses were performed, which stratified the results based on the presence and absence of psoriasis (Table III). Out of the 58 patients with dactylitis, 19 patients (32%) had

psoriasis and 39 (67%) did not have psoriasis. Dactylitis was present in 29 (5.6%) axial SpA -18 (4.1%) nr-ax SpA and 11 (13.9%) AS- and in 29 (32.6%) peripheral SpA -12 (44.4%) PsA and 17 (24.4%) non PsA. Compared to the group of patients with psoriasis related to the dactylitis, the frequency of males was lower in the group of patients without psoriasis (84% vs. 51%; $p=0.02$). The group of patients without psoriasis also had higher frequencies of CBP, HLA-B27 positive, enthesitis, and radiographic sacroiliitis, but these differences did not reach statistical significance. Importantly, 15% of all of the patients who had dactylitis did not present peripheral arthritis or psoriasis and predominantly had manifestations of axial disease.

Discussion

Dactylitis is a clinical finding traditionally related to the diagnosis of PsA with peripheral manifestations (6, 7, 10, 11). Due to this association, most of the studies determining the prevalence of this manifestation in patients

Table II. Multivariable analysis for the association between disease characteristics and dactylitis.

Characteristic	OR	<i>p</i> -value
CBP	0.44	0.07
IBP (ASAS criteria)	0.44	0.07
Peripheral arthritis	4.83	<0.001
Enthesitis	2.49	0.01
Psoriasis	3.62	<0.01
Nail lesion	0.61	0.6
Diarrhoea, cervicitis, urethritis	2.17	0.3
CRP	0.99	0.5
ESR	1.01	0.3
Radiographic sacroiliitis	1.26	0.6
Physician's VAS	0.82	0.01

OR: odds ratio; CBP: chronic back pain; IBP: inflammatory back pain; IBD: inflammatory bowel disease; CRP: C-reactive protein (mg/L); ESR: erythrocyte sedimentation rate (mm/hr); SJC: swollen joint count; VAS: visual analogue scale.

Table III. Demographic and disease characteristics in patients with dactylitis, stratified for the presence of psoriasis.

Characteristic	No psoriasis (n=39)	Psoriasis (n=19)	<i>p</i> -value
Gender (male)	20 (51.3)	16 (84.2)	0.02
CBP	21 (53.8)	7 (36.8)	0.2
IBP (ASAS criteria)	8 (20.5)	3 (15.8)	0.7
HLA-B27 positive	19 (48.7)	4 (21.1)	0.07
Radiographic sacroiliitis	9 (23.1)	2 (10.5)	0.3
Peripheral arthritis	30 (76.9)	14 (73.7)	0.8
Enthesitis	22 (56.4)	6 (31.6)	0.08

CBP: chronic back pain; IBP: inflammatory back pain; IBD: inflammatory bowel disease.

have only focused in PsA. In this study, the prevalence of dactylitis observed in a cohort of patients with early SpA was 9.5%, which reflects that dactylitis is a frequent manifestation in patients with different subtypes of SpA, even during the early stages of the disease. These results are similar to those observed in the DESIR and Maastricht cohorts (14% and 10%, respectively) (11, 12), and they are slightly higher compared to the results of the GESPIC and SPACE cohorts (8% and 5% in patients with ankylosing spondylitis and 4% and 3% in non-radiographic axial SpA, respectively) (13, 14) and 15% in long standing axial SpA (15).

In clinical practice, the first belief of a rheumatologist in a patient with dactylitis is that the patient suffer for PsA. Nevertheless, our study surprisingly observed that the majority of patients with dactylitis do not have psoriasis. In addition, the frequency of females, HLA-B27 carriers, radiographic sacroiliitis and enthesitis was higher among

the subgroup of patients without psoriasis compared to those patients with psoriasis. These results indicate that dactylitis is a typical characteristic of SpA but not necessarily specific of PsA. Additionally, dactylitis was found to be independently associated with the peripheral arthritis, enthesitis and psoriasis. But 1 out of 6 patients with dactylitis had predominant axial disease without psoriasis or peripheral manifestations. This finding supports the decision to include dactylitis as one of the SpA feature for both peripheral and axial ASAS classification criteria for SpA.

Several limitations need to be considered when interpreting the results of this study. First, the limited frequency of dactylitis in this population may have reduced the level of significance of our results. Second, the collection of the main outcome was physician-reported but also self-reported, which may have overestimated the frequency of dactylitis observed. Another limita-

tion is that we could not compare the prevalence of dactylitis in the whole cohort with the prevalence in those fulfilling CASPAR criteria, because we did not have available data about family history of psoriasis or rheumatoid factor, but probably the presence of dactylitis is not related with psoriasis sine psoriasis because the prevalence of HLA B27+ is different in dactylitis with or without psoriasis (48.7% vs. 21.1%). Finally, the established criteria employed to refer patients within the ESPeranza program could affect the results of this study too. However, compared to other cohorts including patients with suspected SpA this cohort has relevant advantages such as the inclusion of patients with both types of predominant manifestations – axial and peripheral – as well as the timing in which patients were recruited (before the development of the ASAS classification criteria).

In summary, dactylitis is a frequent manifestation in patients with early SpA even at early stages of the disease. In addition, the presence of dactylitis is mainly associated with peripheral manifestations and psoriasis but this SpA feature is not exclusive of patients with PsA or peripheral manifestations.

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