

## THE MEANING OF DACTYLITIS IN PATIENTS WITH PSORIATIC ARTHRITIS

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### Abstract

This study aimed to describe dactylitis in a cohort of patients resident in Kuwait with psoriatic arthritis followed prospectively in our Rheumatology clinic and identify whether dactylitis is associated with a worse outcome in patients with psoriatic arthritis.

Between 2005 and 2008, (53) patients with psoriatic arthritis in Kuwait were followed prospectively every two months intervals and all patients files information were searched for patients with dactylitis. Descriptive statistics were used to describe the population and  $\chi^2$  tests to relate dactylitis to radiographic changes.

Dactylitis was documented in 32 patients (59%); 70% most of the cases were recorded at presentation to the clinic. Dactylitis affected feet only in 63% of cases, hands only in 12%, and both hands and feet in 5%. Recurrent dactylitis occurred in 36% of the patients. Increased radiological progression was noted in digits showing dactylitis compared with those without dactylitis (54% v 31%, respectively;  $p < 0.0001$ ).

It is concluded that dactylitis is common among patients with psoriatic arthritis resident in Kuwait. It most often affects the feet, in an asymmetrical distribution. It is associated with a greater degree of radiological damage than occurs in digits not affected by dactylitis.

### Introduction

Psoriatic arthritis is a type of inflammatory arthritis that, according to the National Psoriasis Foundation affects around 10-30% of people suffering from the chronic skin condition psoriasis<sup>1</sup>. Psoriatic arthritis is said to be a seronegative spondyloarthropathy and therefore occurs more commonly in patients with tissue type HLA-B27. Treatment of psoriatic arthritis is similar to that of rheumatoid arthritis. More than 80% of patients with psoriatic arthritis will have psoriatic nail lesions characterized by pitting of the nails, or more extremely, loss of the nail itself.

Psoriatic arthritis can develop at any age, however on average it tends to appear about 10 years after the first signs of psoriasis. For the majority of people

this is between the ages of 30 and 50, but it can also affect children. Men and women are equally affected by this condition. In about one in seven cases the arthritis symptoms may occur before any skin involvement.

Dactylitis, or the "sausage digit", has long been recognized as one of the cardinal features of psoriatic arthritis<sup>3</sup>, occurring in up to 40% of patients<sup>4</sup>. It is often found in the other spondyloarthropathies, especially the reactive arthropathies. It can be seen in gout, sarcoidosis, flexor sheath infections, and sickle cell disease, but very rarely in rheumatoid arthritis<sup>5,6</sup>. Only recently, with ultrasound and magnetic resonance imaging (MRI), have we begun to gain insight into the

underlying pathology of dactylitis<sup>7,8</sup>. These methods of investigation have shown that dactylitis is primarily the result of inflammation of the digital flexor tendon sheaths. An MRI study revealed very few cases with true synovitis of the small joints of the digit (one of 36 joints examined)<sup>8</sup>. Ultrasound imaging in another population, however, showed joint involvement in 52% of digits<sup>7</sup>, compared with none in the Italian cohort. The prevalence and natural history of dactylitis among patients with psoriatic arthritis is poorly described. Radiographs carried out at time of dactylitis have revealed periosteitis and joint space narrowing, but it is not known whether dactylitis itself is associated with erosive joint damage and deformity or is a comparatively benign condition.

Our aims in this study were to identify the frequency of dactylitis among patients in Kuwait with psoriatic arthritis, and to investigate whether it is associated with more severe radiological changes.

### Patients & Methods

All data in this study were derived from the cohort of patients attending two Rheumatology clinics. First clinic at the Shakain Alfareis centre the "only" tertiary Rheumatology Centre in Kuwait and second clinic Aladan Hospital Rheumatology Clinic which serve more than 500.00 residents. Patients are referred from primary, secondary, and tertiary care and may be de novo cases or patients with established disease. They are diagnosed with psoriatic arthritis if they have an "inflammatory arthritis" associated with psoriasis and if other rheumatologic conditions have been ruled out<sup>9</sup>. These patients were followed prospectively and assessed every 2 months intervals by Rheumatologist. And at each clinic visit a complete history is elicited and physical examination and laboratory assessments are done according to a standard protocol. Radiolog-

ical examinations of the peripheral joints and the spine are carried out at once a year intervals for three year follow up period. All information collected is entered in to patients files include copies of their radiological reports

The clinical assessment of actively inflamed joints and the evaluation of damaged joints, both clinical and radiological assessment done by same Rheumatologist and the same Radiology Department. Between 2005 and 2008, 53 patients were registered in both clinics, the files were searched for the presence of dactylitis, and all records were reviewed to confirm the presence of dactylitis and the sites at which it occurred.

**Definition of dactylitis:** Dactylitis or sausage digit is a inflammation of an entire finger or toe, and can be painful. The word dactyl comes from the Greek word "daktylos" meaning "finger". In its medical term, it refers to both the fingers and the toes. Dactylitis can occur in seronegative arthropathies, such as psoriatic arthritis and ankylosing spondylitis, in sickle-cell disease as result of a vasoocclusive crisis with bone infarcts, and in infectious conditions including tuberculosis and leprosy. In sickle-cell disease it is manifested for the first time between 6-9 month old infants. Dactylitis may be acute, with painful inflammatory changes, or chronic, where the digit remains swollen despite the disappearance of acute inflammatory changes. The presence of acute painful inflammatory dactylitis is recorded for each digit; chronic clinically non-inflammatory (non-tender) dactylitis is recorded separately. In this study only acute inflammatory dactylitis was considered.

**Radiology:** Radiographs of the hands, feet, and spine including the sacroiliac joints are taken at first clinic visit and at one year intervals or earlier if indicated. They are reviewed by a single Radiology Department in each centre and scored by

rheumatologist according to the modified Steinbrocker technique, as previously validated in population with Psoriatic Arthritis<sup>11</sup>.

In this scoring System each joint is rated as follows: 0, normal; 1, soft tissue swelling or juxta-articular osteopenia; 2, erosions present; 3, erosions and loss of joint space; 4, complete destruction. All information is entered into the patient's files for analysis.

Radiographic progression of disease was determined by comparing pre-and post-dactylitis radiographs. The pre-dactylitis radiograph was the one taken closest to the onset of dactylitis or, where that was not available (such as at the first visit), the one taken at the time of clinical presentation. The post-dactylitis radiograph was the most recent one taken. Progression of radiological damage was considered to have occurred if the score for any of the finger joints in a given digit (metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints for digits 2 to 5 in the hands, and metacarpophalangeal and interphalangeal joint of the thumbs) had increased between x rays to at least a score of 2. Owing to the difficulties in interpreting x rays of the small joints of the feet, only the metacarpophalangeal joints and first interphalangeal joint were scored.

**Statistical analysis:** Descriptive statistics were used to describe the patient population. The absence or presence of dactylitis in individual digits among the patients with dactylitis was related to the absence or presence of radiological progression for that digit;  $\chi^2$  tests were used to assess the association between dactylitis and radiological progression.

## Results

**Prevalence:** Of the 53 patients registered in the psoriatic arthritis clinic between 2005 and 2008, 32 (59%) had at least one episode of acute dactylitis. Only the first episode is considered in this

report, and the prevalence of dactylitis at Presentation to the clinic was 33.5%. Thirty of the 53 patients with dactylitis (57%) were male and 43% were female (table I). Their mean (SD) age was 35(12.1) years, which was on average 8.0 (8.7) years after the onset of psoriatic arthritis.

**Natural history:** Twenty three of the 53 patients with psoriatic arthritis (43%) had dactylitis in a single digit, and 9 patients (16%) had multiple digits affected. The maximum number of digits affected in a single patient at any one time was 5 (present in two patients (3.7 %)). The mean number of digits affected per patient was 2. Recurrent or persistent dactylitis occurred in the same digit in 24 of 53 patients (44%) seen on more than one occasion.

**Distribution:** Information on the exact digit involved was available for the 32 patients. Dactylitis was asymmetrical in 18 patients (56%) of the patients. The left side was affected more often than the right (33% v 25%). Four patients (12%) had dactylitis in both the hands and feet; Seven (22%) had it in the hands only; 21 patients (66%) had it only in the feet. Thus (78%) of the patients had dactylitis in the feet, and (34%) in the hands. The mean number of digits with dactylitis in the feet was 1.7 (range 0 to 5) and in the hands it was 0.6 (range 0 to 5). The most frequently affected digit in both hands was the second digit (the index finger). The third digit (middle finger) was the second most commonly involved. In the feet the fourth digit was the most often affected, again usually bilaterally (table II).

### Radiological damage:

Pre-and post-dactylitis X rays to allow comparisons were available for 29 patients. The mean (SD) length of time between the occurrence of dactylitis and the pre-dactylitis x rays was 0.5 (1.3) years, and the post-dactylitis X rays, 2.4 (1.5) years. In these 29 patients there were 580 digits available for compari-

son. Dactylitis had occurred in 190 of these digits, 60 in the hands and 130 in the feet.

Significantly more radiological damage was observed in those digits affected by dactylitis than in unaffected digits ( $p < 0.0003$ ). Of the 60 episodes of dactylitis recorded in the hands, 33 (55%) showed evidence of radiological progression, compared with 62 of the remaining 230 digits (27%) ( $p < 0.0001$ ). Looking at the individual joints of the affected digit (metacarpophalangeal, proximal interphalangeal, distal interphalangeal), there was no significant difference in incidence of radiological progression (32%, 31%, and 31%, respectively). Examining the feet, 93 of the 321 dactylitis episodes (29%) had radiological evidence of damage at follow up. Radiological progression was significantly greater than the 20% seen in the unaffected digits ( $p < 0.0004$ ). The proximal interphalangeal and distal interphalangeal joints of the lateral four toes were not included in the assessment, which may have artificially lowered the rate of damage for dactylitis digits in the feet. In the first toe, for which both metatarsophalangeal and interphalangeal joint data were available, there was no significant difference in progression (26% and 20%, respectively). Though dactylitis was less frequent in the hands (36%) than in the feet (77%), when it did occur, the risk of apparent radiological damage was slightly greater, even when comparing metacarpophalangeal and metatarsophalangeal joints (32% v 26%) (Table III). Fifteen patients had recurrence of dactylitis in the course of follow up. Digits with recurrent dactylitis more often had radiological progression than those without (45% vs. 30%); ( $p = 0.003$ ).

### Discussion

Dactylitis is one of the hallmark features of the spondyloarthropathies, and especially psoriatic arthritis. In the Kuwait cohort of patients with psoriatic

arthritis it is a common event, occurring in 48% of patients at some time. Dactylitis was most often seen at the first clinic visit (69%). The high frequency at the first clinic visit may reflect the fact that dactylitis is a well recognized and distinctive sign that triggers referral to a specialist clinic.

Trauma has been described as a possible cause or trigger for psoriatic arthritis, at least on an anecdotal basis<sup>12</sup>. The distribution of dactylitis tends to support this assumption, with a higher prevalence in the feet, left hand, and index fingers.

The natural history of psoriatic arthritis, particularly with regard to its radiological progression, is yet to be well described. We do not know if damage only occurs in clinically affected joints, or what markers predict progression for a single joint. MRI studies suggest that dactylitis is primarily an inflammation of the flexor tenosynovial sheaths, with limited joint involvement.

A study using ultrasound on a limited group of patients showed evidence of joint involvement with articular synovitis in up to 52% of cases<sup>7,8</sup>. Why this should be is unclear, but it may reflect imaging differences in the sensitivity of testing between the two populations. Alternatively they may have been investigated at different stages of the natural history of dactylitis. In the ultrasound cohort<sup>7</sup>, radiographic evidence of joint erosion was already evident in 50% of digits with dactylitis, compared with only one case in the MRI study. The level of joint involvement detected on ultrasound is, however, consistent with the proportion of patients developing radiological damage after an episode in the present study.

Our study confirms that dactylitis is not just a disease of the tenosynovium but is also associated with radiologically evident erosive damage to joints. There does not appear to be any preference for damage to a particular small joint in an affected digit, confirming that dactylitis

affects the whole finger with equal severity. Although we did not assess the proximal and distal interphalangeal joints of the toes systematically (except for the interphalangeal joint of the first toe), it seems likely that they will also be adversely affected. Thus the impact of the dactylitis on radiological change may have been underestimated.

Do these findings have implications for therapy? Psoriatic arthritis can be highly destructive, as demonstrated by ‘‘arthritis mutilans.’’ It is not known whether disease modifying anti-rheumatic drugs or local treatment with steroid injections have an affect on radiological progression. A recent study suggests that the anti-tumor necrosis factor agent etanercept may halt radiological progression in psoriatic arthritis<sup>13</sup>. However; dactylitis was not assessed as an out-

come measure in that study. We suggest aggressive treatment with anti-tumor necrosis factor agents, like etanercept is warranted in patient with psoriatic arthritis. TNF alpha is a drug of choice.

In conclusion, Dactylitis is common among patient's residents in Kuwait with psoriatic arthritis. It most often affects the feet than the hands, in an asymmetrical distribution, left side more than right side It is associated with a greater degree of radiological damage than occurs in digits not affected by dactylitis, and its presence should prompt the physician to start more aggressive treatment like anti TNF inhibitor .this finding had been confirmed before in only one rheumatology clinic in north America but our study first in middle east it suggest for patient with psoriatic arthritis who presented with dactylitis.

**Table I: Disease characteristics of psoriatic arthritis patients with dactylitis(n=32)**

Variables	Presentation	First visit with dactylitis
<b>age of onset(years)</b>	<b>Mean, SD</b>	
Psoriasis	27(12.1)	
Psoriatic Arthritis	32(13.1)	
<b>Disease duration (Years)</b>		
Psoriasis	14(11.2)	12(10.2)
Psoriatic Arthritis	5(4.9)	8(8.7)
<b>Age(Years)</b>	35(12.1)	36(13.3)
<b>Male Sex</b>	57%	
<b>Arthritis pattern</b>		
1- Distal	8%	7%
2- Oligoarthritis	14%	13%
3- Polyarthritis	44%	43%
4- Back only	0.40%	
5- Back+1	4%	4%
6- Back +2	6%	5%
7- Back+3	23%	28%
<b>Number of active joints</b>	12(8.1)	11(9.2)
<b>No. of clin. damaged joints</b>	2(5.3)	3(6.1)
<b>Dactylitis (% percent)</b>	33.50%	
<b>Psoriasis (% percent)</b>	95%	97%
<b>Nail lesion(percent)</b>	84%	85%
<b>Drug Treatment</b>		
None	14%	11%
NSAID	47%	42%
Methotrexate	13%	15%
PUVA	6%	9%
Corticosteroid	15%	18%

**Table II: Distribution of Dactylitis among digit (n= 32)**

Digit	R hand	L hand	R foot	L foot
	4%	5%	15%	16%
	11%	12%	18%	19%
	9%	10%	15%	16%
	3%	4%	28%	29%
	2%	3%	14%	15%

Table III: Radiological damage in 29 patients with dactylitis

	No of digits/Joints	Radiological damage
<b>Hands</b>		
<b>Acute dactylitis</b>	<b>60</b>	<b>33(55%)</b>
<b>NO dactylitis</b>	<b>230</b>	<b>62(27%)</b>
MCP Joints	<b>60</b>	<b>20(33%)</b>
PIP Joints	<b>60</b>	<b>19(31%)</b>
DIP Joints	<b>40</b>	<b>13(31%)</b>
<b>Feet</b>		
<b>Acute dactylitis</b>	<b>130</b>	<b>38(29%)</b>
<b>No dactylitis</b>	<b>160</b>	<b>32(20%)</b>
MTP Joints	<b>130</b>	<b>35(26%)</b>
First dactylitis	<b>25</b>	<b>5(20%)</b>

significant difference between affected and unaffected digit ( $p < 0.0005$ ). DIP, distal interphalangeal, IP interphalangeal, MTP metatarsophalangeal, PIP Proximal interphalangeal.

## References

- Gladman DD, Rahman P. Psoriatic arthritis. In: Ruddy S, Harris ED, Sledge CB, Budd RC, Sargent JS, eds. *Kelly's textbook of rheumatology*, 6th ed. Philadelphia: WB Saunders Co, 2001:1071–9.
- Gladman DD. Psoriatic arthritis. *Baillie're's Clin Rheumatol* 1995;9:319–29.
- Moll JMH, Wright V. Psoriatic arthritis. *Semin Arthritis Rheum* 1973;3:55–78.
- Veale D, Rogers S, Fitzgerald O. Classification of clinical subsets in psoriatic arthritis. *Br J Rheumatol* 1994;33:133–8.
- Fournie B, Crognier L, Arnaud C, Zabraniecki L, Lascaux-Lefebvre V, Marc V, et al. Proposed classification criteria of psoriatic arthritis. *Rev Rhum Engl Ed* 1999;66:446–56.
- Rothschild BM, Pingitore C, Eaton M. Dactylitis: implications for clinical practice. *Semin Arthritis Rheum* 1998;28:41–7.
- Kane D, Gearney T, Bresnihan B, Gibney R, Fitzgerald O. Ultrasonography in the diagnosis and management of psoriatic dactylitis. *J Rheumatol* 1999;25:1746–51.
- Olivieri I, Barozzi L, Favaro L, Pierro A, de Matteis M, Borghi C, et al. Dactylitis in patients with seronegative spondyloarthritis. *Arthritis Rheum* 1996;39:1524–8.
- Gladman DD, Shuckett R, Russell ML, Thorne JC, Schachter RK. Psoriatic arthritis – clinical and laboratory analysis of 220 patients. *Q J Med* 1987;62:127–41.
- Gladman DD, Farewell V, Buskila D, Goodman R, Hamilton L, Langevitz P, et al. Reliability of measurements of active and damaged joints in psoriatic arthritis. *J Rheumatol* 1990;17:62–4.
- Rahman P, Gladman DD, Cook RJ, Zhou Y, Young G, Salonen D. Radiological assessment in psoriatic arthritis. *Br J Rheumatol* 1998;37:760–5.
- Punzi L, Pianon M, Bertazzolo N, Faggio U, Rizzi E, Rossini P, et al. Clinical, laboratory and immunogenetic aspects of post-traumatic psoriatic arthritis: a study of 25 patients. *Clin Exp Rheumatol* 1998; 16:277–81.
- Ory P, Sharp JT, Salonen D, Rubeinstein J, Mease PJ, Kivitz AJ, et al. Etanercept (ENBRELH) inhibits radiographic progression in patients with psoriatic arthritis [abstract]. *Arthritis Rheum* 2002;46(suppl 9):S196.