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ORIGINAL ARTICLE

Nail Psoriasis in Individuals With Psoriasis Vulgaris: A Study of 661 Patients

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Psoriasis;
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Abstract
Background and objectives: The nails are affected in a substantial number of patients with psoriasis. Nevertheless, few epidemiological studies have reported the characteristics of patients with nail psoriasis. Here we describe the epidemiology of nail psoriasis and the main characteristics of affected patients.
Patients and methods: We undertook a prospective case-control study at Hospital Universitario Marqués de Valdecilla and Hospital Universitario Central de Asturias in Spain between January 2007 and December 2009.
Results: Of a total of 661 patients included, 47.4% were diagnosed with nail psoriasis, which was 13.5% more prevalent in men. The group of patients with nail disease had more severe psoriasis (12.82 vs 8.22 points on the psoriasis area and severity index) and a longer disease duration (20.30 vs 13.94 years), and included a larger percentage of patients with psoriatic arthritis (29.7% vs 11.5%), a positive family history of the disease (53.7% vs 42.8%), and a body mass index greater than 30 (31.6% vs 23.9%). A larger percentage of the patients with nail disease had early-onset psoriasis (74.1% vs 65.5%) and fewer were carriers of the human lymphocyte antigen Cw*0602 allele (33% vs 50.3%).
Conclusions: Nail disease is frequent in psoriasis and is associated with greater severity of psoriasis and a larger number of comorbidities.

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PALABRAS CLAVE
Psoriasis;
Uña

Psoriasis ungueal: estudio en 661 pacientes con psoriasis vulgar

Resumen

Introducción y objetivos: La psoriasis ungueal afecta a un número importante de pacientes con psoriasis. No obstante, son raros los estudios epidemiológicos que recojan las características de estos individuos. Describimos la epidemiología y principales características de los pacientes con psoriasis ungueal.

Material y método: Se trata de un estudio prospectivo de casos y controles realizado en el Hospital Universitario Marqués de Valdecilla y Hospital Universitario Central de Asturias entre enero de 2007 y diciembre de 2009.

Resultados: De un total de 661 pacientes la psoriasis ungueal fue diagnosticada en el 47,4%de los pacientes. La prevalencia fue 13,5 puntos mayor en hombres que en mujeres. Los pacientes con afectación ungueal presentan mayor severidad de la enfermedad (PASI 12,82 vs 8,22), mayor duración de la misma (20,30 vs 13,94 años), incidencia superior de artropatía psoriática (29,7%vs 11,5%), mayor frecuencia de antecedentes familiares positivos (53,7%vs 42,8%) y mayor proporción de obesidad IMC > 30 (31,6vs 23,9%). La psoriasis en el grupo con afectación ungueal se inicia de forma precoz (74,1 vs 65,5%) y se asocia con menor frecuencia a Cw*0602 (33 vs 50,3%).

Conclusiones: La afectación ungueal es una manifestación frecuente en los pacientes con psoriasis y se asocia a mayor gravedad de la enfermedad y mayor número de comorbilidades.

Introduction

The umbrella term *psoriasis* embraces several clinical forms that differ according to lesion site, clinical features (size, thickness, shape, erythema, scaling), association or otherwise with psoriatic arthritis, presence or absence of nail disease, time since onset, family history (and the genetic factors implicated), and disease course in relation to these characteristics.[1]

Nail psoriasis, which can present alone or as part of more extensive psoriasis, is a very important disease but one that is often overlooked. First, patients with disease of the nails and periungual tissue, often with painful consequences, have difficulty performing fine manual tasks; 58.9% of patients, for example, are restricted in simple everyday activities such as dressing and 49% experience reduced professional capacity.[2-4] Second, given the highly visual nature of the disease, 90% of affected individuals have a distorted perception of their physical appearance that considerably impairs their quality of life.[2] Moreover, nail psoriasis is a chronic disease that is refractory to conventional treatment, explaining why its importance tends to be overlooked in medical settings.[5] Another important point is its high incidence. Nail involvement in the course of psoriasis is very common, with a prevalence of between 15%and 53%depending on the series,[6,7] and even higher figures have been reported for hospitalized patients (78%) and for lifetime prevalence (90%).[6] Only 1% to 5% of patients have exclusive nail disease.[8]

The aim of this study was to determine the prevalence of nail disease in patients with psoriasis in our setting and to explore the corresponding clinical implications.

Patients and Methods

Recruitment and Clinical Evaluation of Patients and Controls

We performed a cross-sectional hospital-based study in which we compared 661 patients with psoriasis divided into 2 groups according to whether or not they had nail disease. All of the patients were evaluated consecutively at the outpatient clinics of Hospital Universitario Central de Asturias and Hospital Universitario Marqués de Valdecill, both in the north of Spain, between January 2007 and December 2009. The inclusion criteria were an age of over 18 years and a clinical diagnosis of chronic plaque psoriasis. The diagnosis was confirmed in all cases by at least 2 dermatologists based on established clinical criteria.[9] Special attention was paid to the recording of data such as the date of onset of psoriasis and a family history of psoriasis, defined by the presence of this disease in at least 1 first-degree relative. We also recorded patients' age and sex and whether or not they had nail or joint disease. All patients with joint symptoms were examined and diagnosed by a rheumatologist. Patients receiving systemic therapy at the time of inclusion or who had received systemic medications in the month leading up to this time were excluded. The study was approved by the Institutional Review Board of Hospital Universitario Central de Asturias and performed in accordance with the principles established in the Declaration of Helsinki.

Anthropometric Assessments

All of the patients underwent physical examination, which included weight and height measurements. Height

was expressed as centimeters and weight as kilograms, with rounding off to the nearest 0.1 kg. Body mass index (BMI) was calculated as weight in kilograms divided by the square of the height in meters. Patients were then classified into 3 groups (normal weight [BMI, <25kg/m^2], overweight [BMI, 25-29.9 kg/m^2], and obese [BMI, ≥30kg/m^2]) according to the cutoffs determined by the World Health Organization.[10] Waist circumference was measured in centimeters.

Skin Evaluation

Psoriasis severity was evaluated using the Psoriasis Area and Severity Index (PASI) according to the method originally described by Fredriksson and Petterson.[11] Inter-rater agreement, which was analyzed by comparing the scores given by different dermatologists at the time of the first visit, was acceptable. Patients were divided into 2 groups according to whether they had a PASI score of over 10 (moderate to severe psoriasis) or of 10 or less (mild psoriasis).

Nail Examination

The presence of nail disease was evaluated on the finger nails only using the method described by Mallbris et al,[9] with evaluation of nail pitting, onycholysis, subungual hyperkeratosis, and dystrophy. Toe nails were not evaluated.[1,12] Samples were not systematically taken for potassium hydroxide staining, direct visualization, or fungal culture.

Laboratory Tests

Blood samples were routinely drawn after 12 hours' fasting and analyzed by the biochemistry departments of the participating hospitals for serum levels of aspartate aminotransferase, alanine aminotransferase, γ-glutamyl transpeptidase, total cholesterol and triglycerides, and low-density lipoprotein (LDL) cholesterol and high-density lipoprotein (HDL) cholesterol. Testing for the Cw*0602 allele of the human lymphocyte antigen (HLA)-C locus was performed by the immunology department at Hospital Universitario Central de Asturias.

Definition of Metabolic Syndrome

Patients were considered to have metabolic syndrome (according to the Adult Treatment Panel [ATP] III criteria[13]) if they had 3 or more of the following risk factors:

1. A waist circumference of >102 cm for men and >88 cm for women
2. A serum triglyceride level of ≥150 mg/dL (≥1.7 mmol/L)
3. Blood pressure of ≥130/85 mm Hg
4. A HDL-cholesterol level of <40 mg/dL (<1.0 mmol/L) for men and <50 mg/dL (<1.3 mmol/L) for women.
5. A fasting glucose level of 110 to 126 mg/dL (6.1-7.0 mmol/L)

Table 1 Characteristics of Patients With Psoriasis (n=661)[a]

	Psoriasis (n=661)[a]
Men/Women	350 (53)/311 (47)
Mean (SD) age (range), y	47.43 (15.71) (18-90)
Early-onset psoriasisa	460 (69.6)
Severe psoriasis (PASI >10)	268 (40.5)
Family history	317 (48)
Nail disease	313 (47.4)
Psoriatic arthritis	133 (20.4)
HLA-Cw*0602 positivity	268 (40.6)
BMI >30	182 (27.5)
High blood pressure	200 (30.3)
Elevated triglycerides	168 (25.4)
Type 2 diabetes mellitus	79 (12)
Waist circumference	315 (47.7)
Metabolic syndrome (ATP III)	157 (23.8)
HDL cholesterol	182 (27.5)

Abbreviations: ATP III, Adult Treatment Panel III guidelines; BMI, body mass index (kg/m^2); HDL, high-density lipoprotein; LDL, low-density lipoprotein; PASI, psoriasis area and severity index.
[a]Data shown as number (%) of patients unless otherwise indicated.

Logically, factors 2 to 5 were considered to be risk factors in patients who had normal values but who were receiving treatment for the corresponding conditions.

Statistical Analysis

Statistical analysis was performed using R 2.10 software (www.r-project.org). Comparisons between patients and controls were performed using the *t* test, the Pearson χ^2 test, and analysis of odds ratios. The Fischer exact test was used to compare dichotomous variables between groups and the *t* test was used to compare continuous variables. All the tests were 2-tailed. The cutoff for statistical significance was set at $P=.05$.

Results

In total, 661 patients with plaque psoriasis were included in the study. Their characteristics are summarized in Table 1.

Nail involvement was diagnosed in 313 (47.4%) of these patients. The corresponding 95% confidence interval (CI) was 43.47% to 51.23%, indicating that the true prevalence would be within this range. On comparing sexes, it was seen that 188 men (53.7%) and 125 women (40.2%) had nail psoriasis. The proportion of men with and without nail involvement was 60.1% (n=188) and 46.6% (n=160), respectively (OR, 1.73; 95% CI, 1.27-2.35; $P=.001$). The mean (SD) age of patients with nail disease (47.45 [14.18] years; range, 18-90 years) was practically identical to that of those without nail disease (47.39 [16.99] years; range, 18-82 years) ($P=.965$).

The age of onset of plaque psoriasis in patients with nail disease was 27.03 (16.23) years compared to 33.31 (19.06) years in patients without nail disease (95% CI, 3.56-8.10; $P<.001$).

Factors Associated With Nail Disease

Patients with nail disease had a significantly higher mean PASI score than those without (12.82 [12.86] vs 8.22 [8.23], $P<.001$) On analyzing PASI scores by sex, both men and women in the nail-disease group had significantly higher PASI scores than their counterparts in the control group (12.71 [14.14] vs 8.15 [8.58] for men and 12.89 [11.97] vs 8.30 [7.85] for women; $P<.001$ in both cases). Figure 1 shows these results, alongside results for a similar series of German patients.[14] In our series, the proportion of patients with severe psoriasis (PASI >10) was over 20% higher in the nail-disease group than in the control group.

Table 2 shows the different study parameters analyzed in both groups.

Of the 313 patients with nail psoriasis, 93 (29.7%) had associated psoriatic arthritis; this was over twice the proportion of patients with this condition in the control group (11.5% [40 of 348 patients], OR, 3.25; 95% CI, 2.16-4.90; $P<.001$).

The proportion of patients with a family history of psoriasis was 10.9 percentage points higher in the nail group than in the control group (Figure 2); the proportions were also higher for early onset of psoriasis (almost 9% higher) and a BMI of over 30 (almost 8% higher); there was also a difference for the proportions of patients carrying the HLA-Cw*0602 allele (almost 20% lower in the nail-disease group). The results for elevated triglyceride levels, type 2 diabetes mellitus, and HDL-cholesterol were similar for both groups. While no statistically significant differences were found between the 2 groups for waist circumference according to the ATP III criteria ($P=.054$), a significant difference was detected on comparing waist circumference measurements (Table 3).

Table 3 shows the mean values for biochemistry profile, waist circumference, and time since onset of psoriasis; no statistically significant differences were detected between the groups in any of the cases. Nonetheless, patients with nail psoriasis had a worse biochemical profile than their counterparts in the control group, with higher liver enzymes, total cholesterol, LDL-cholesterol, triglyceride, and LDH levels and lower cholesterol levels They also had a longer time since onset of psoriasis.

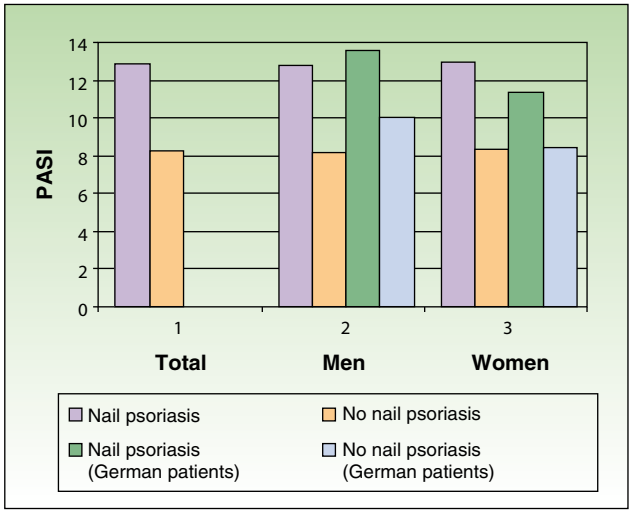

Figure 1 Mean psoriasis area and severity index (PASI) scores for men and women from the present study and corresponding data for a series of German patients.[14] Adapted from Augustin et al.[14]

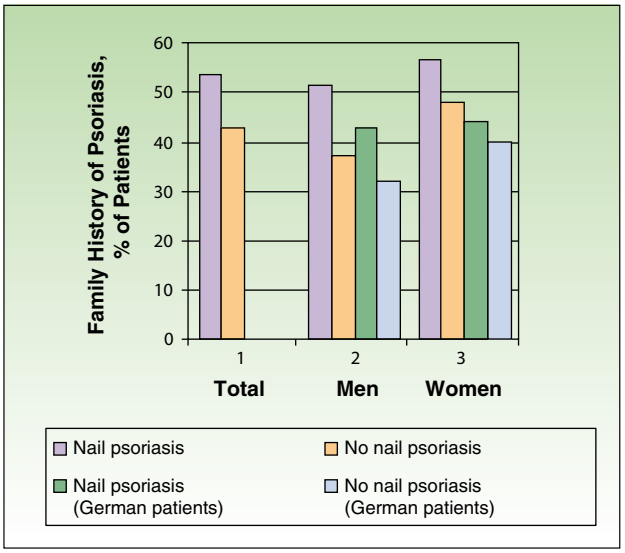

Figure 2 Family history of psoriasis for all patients (shown by men and women) and corresponding data for German patients.14 Adapted from Augustin et al.[14]

Discussion

Few studies of the epidemiology, clinical features, and probable systemic repercussions of nail psoriasis have been published to date. The aim of the present study was to determine the prevalence of nail disease in a group of patients with psoriasis referred to 2 dermatology departments in the north of Spain and to characterize the differences in disease patterns between patients with and without nail involvement. To strengthen the validity of the study, all the data related to nail involvement were collected by at least 2 trained dermatologists in each case.

Our findings show that 47.7% of patients with psoriasis had nail involvement. This proportion is somewhat higher than that reported by Augustin et al[14] in Germany (40.9%), lower than that reported by Taieb et al[15] in France (61%),[15] and almost identical to that reported by Baran[16] (50%). Of the patients in the nail-psoriasis group in our study, 53.7% were men and 40.2% were women. This difference in prevalence between men and women (over 10%) has also been reported by Reich[2] and Augustin et al.[14] Reich, in addition, found a correlation between greater body weight and a higher prevalence of nail psoriasis in men. The percentage of patients with psoriasis treated in primary care in Spain once diagnosed varies greatly, although it can probably be assumed that most cases are treated by dermatology specialists. As has been reported previously,[14] we cannot rule out the possibility that nail psoriasis might

Table 2 Qualitative Characteristics of Patients With Psoriasis, With and Without Nail Involvement

	Nail Psoriasis (n=313) Men (n=188)[a] Women (n=125)[a]	No Nail Psoriasis (n=348) Men (n=162)[a] Women (n=186)[a]	OR (95% CI)	*P* Value
Early onset (<40 y)	232 (74.1%)	228 (65.5%)	1.51 (1.06-2.14)	.018
Men	139 (73.9%)	98 (60.5%)	0.54 (0.34-0.84)	.008
Women	93 (74.4%)	130 (69.9%)	0.79 (0.48-1.32)	.442
Severe psoriasis (PASI>10)	161 (51.4%)	107 (30.7%)	2.39 (1.74-3.28)	<.001
Men	100 (66.7%)	50 (33.3%)	2.54 (1.64-3.95)	<.001
Women	61 (48.8%)	57 (30.6%)	2.15 (1.34-3.45)	.001
Family history	168 (53.7%)	149 (42.8%)	1.55 (1.14-2.10)	.006
Men	97 (51.6%)	60 (37%)	1.81 (1.18-2.78)	.007
Women	71 (56.8%)	89 (47.8%)	1.43 (0.90-2.26)	.133
Psoriatic arthritis	93 (29.7%)	40 (11.5%)	3.25 (2.16-4.90)	<.001
Men	52 (27.7%)	12 (7.4%)	4.78 (2.45-9.33)	<.001
Women	41 (32.8%)	28 (15.1%)	2.75 (1.59-4.77)	<.001
HLA-Cw*0602 positivity	103 (33%)	175 (50.3%)	0.40 (0.35-0.67)	<.001
Men	73 (38.8%)	73 (45%)	0.77 (0.49-1.21)	.284
Women	30 (24%)	102 (54.8%)	0.26 (0.15-0.44)	<.001
BMI >30	99 (31.6%)	83 (23.9%)	1.48 (1.05-2.08)	.029
Men	68 (36.2%)	40 (24.7%)	1.73 (1.09-2.75)	.027
Women	31 (24.8%)	43 (23.1%)	1.10 (0.64-1.86)	.786
High blood pressure	103 (32.9%)	97 (27.9%)	1.27 (0.91-1.77)	.175
Men	71 (37.8%)	46 (28.4%)	1.53 (0.97-2.40)	.070
Women	32 (25.6%)	51 (27.4%)	0.91 (0.54-1.52)	.794
Elevated triglycerides (ATP III)[b]	85 (25.2%)	83 (23.9%)	1.19 (0.84-1.69)	.371
Men	64 (34%)	53 (32.7%)	1.06 (0.68-1.66)	.821
Women	21 (16.8%)	30 (16.1%)	1.05 (0.57-1.93)	.877
Type 2 diabetes mellitus	39 (12.5%)	40 (11.5%)	1.10 (0.68-1.75)	.720
Men	26 (13.8%)	23 (14.2%)	0.97 (0.53-1.78)	1.000
Women	13 (10.4%)	17 (9.1%)	1.15 (0.54-2.47)	.701
Waist circumference (ATP III)[c]	162 (51.8%)	153 (44%)	1.37 (1.00-1.86)	.051
Men	88 (46.8%)	49 (30.2%)	2.03 (1.30-3.15)	.002
Women	74 (59.2%)	104 (55.9%)	1.14 (0.72-1.81)	.640
Metabolic syndrome (ATP III)	79 (25.2%)	78 (22.4%)	1.17 (0.82-1.67)	.411
Men	54 (28.7%)	34 (21%)	1.52 (0.93-2.48)	.109
Women	25 (20%)	44 (23.7%)	0.80 (0.46-1.40)	.488
HDL cholesterol (ATP III)[d]	64 (20.4%)	79 (22.7%)	0.87 (0.60-1.27)	.509
Men	37 (19.7%)	28 (17.3%)	1.17 (0.68-2.01)	.584
Women	27 (21.6%)	51 (27.4%)	0.73 (0.43-1.24)	.286

Abbreviations: ATP III, Adult Treatment Panel III guidelines; BMI, body mass index (kg/m^2); CI, confidence interval; HDL, high-density lipoprotein; OR, odds ratio.

[a]Expressed as number (%) of patients.

[b]>1.7 mmol/L^1.

[c]>102 cm (men) or >88 cm (women).

[d]<1.03 mmol/L^1 (men) or <1.29 mmol/L^1 (women).

be less common in patients with mild psoriasis who do not consult a dermatologist.

It is known that nail psoriasis has a genetic component, which has been linked on occasions to HLA-B27, HLA-Aw19, and HLA-Bw3 and even to polymorphisms in the coding regions for the interleukin (IL) 23 and IL-12 receptor; nail psoriasis has also been shown not to be associated with HLA-Cw*0602.[1,17,18] Our study confirms this lack of association, as this allele was only found in 33% of patients with nail psoriasis compared to in 50.3% of those without this condition (OR, 2.05; 95% CI, 1.36-3.09). Nonetheless, we did find a relatively weak association between psoriasis and HLA-Cw*0602 in our patients, supporting previous findings by our group.[19,20] Patients with this genetic component would develop autoinflammatory disorders involving innate immunity and probably linked to mechanical stress at the enthesis (microtrauma).[5]

The pathogenic mechanism described in the above paragraph highlights the importance of identifying nail involvement in patients with psoriasis as it might be a marker

Table 3 Biochemical Profile, Waist Circumference, and Time Since Onset of Psoriasis in Patients With and Without Nail Psoriasis

	No Nail Psoriasis[a] (348 Patients)	Nail Psoriasis[a] (313 Patients)	(95% CI)	*P*
Total AST	24.28 (12.82)	25.68 (12.69)	−3.37 to 0.57	.162
Men	22.03 (12.46)	21.98 (8.08)	−2.26 to 2.35	.970
Women	26.94 (12.75)	28.10 (14.47)	−4.06 to 1.72	.428
ALT	27.17 (15.82)	29.81 (18.15)	−5.28 to 0.00	.050
Men	22.71 (13.38)	23.02 (12.04)	−3.21 to 2.58	.830
Women	32.42 (16.88)	34.25 (20.04)	−5.74 to 2.10	.361
GGT	32.32 (47.48)	38.79 (61.61)	−15.02 to 2.08	.138
Men	26.11 (43.61)	23.91 (28.70)	−5.92 to 10.32	.594
Women	39.62 (50.83)	48.52 (74.26)	−22.27 to 4.62	.191
LDH	291.51 (92.78)	304.41 (77.38)	−26.03 to 0.23	.054
Men	294.90 (91.42)	303.71 (80.52)	−28.40 to −10.77	.376
Women	287.51 (94.48)	304.86 (75.48)	−35.76 to 1.05	.065
Total cholesterol	203.44 (42.74)	209.70 (42.82)	−12.85 to 0.34	.063
Men	198.40 (41.16)	212.38 (42.05)	−23.56 to −4.38	.004
Women	209.38 (43.93)	207.95 (43.38)	−7.87 to 10.74	.762
HDL cholesterol	55.23 (15.66)	53.48 (15.23)	−6.27 to 4.14	.148
Men	58.23 (14.52)	60.61 (16.38)	−5.99 to 1.22	.194
Women	51.71 (16.26)	48.81 (12.42)	−2.19 to 6.01	.068
LDL cholesterol	126.58 (33.85)	131.95 (36.02)	−10.78 to 0.25	.051
Men	122.41 (32.78)	129.80 (34.93)	−15.23 to 0.46	.065
Women	131.48 (34.54)	133.36 (36.75)	−9.47 to 5.69	.625
Triglycerides	120.73 (87.42)	129.43 (83.33)	−21.86 to 4.46	.195
Men	108.50 (80.81)	108.50 (75.13)	−17.80 to 17.80	1.000
Women	143.12 (85.75)	143.12 (85.75)	−27.09 to 11.11	.441
Waist circumference, cm	93.97 (13.12)	97.17 (13.38)	−5.25 to −1.16	.002
Men	90.88 (14.49)	90.89 (13.44)	−3.19 to 3.17	.995
Women	97.52 (10.31)	101.38 (11.59)	−6.18 to −1.54	.001
Time since onset, y	13.94 (14.90)	20.30 (14.48)	−8.60 to −4.10	<.001
Men	12.83 (14.31)	20.04 (13.95)	−9.26 to −2.28	<.001
Women	14.91 (15.36)	20.69 (15.30)	−10.19 to −4.23	.001

Abbreviations: ALT, alanine aminotransferase; AST, aspartate aminotransferase; CI, confidence interval; GGT, γ-glutamyl transferase; HDL, high-density lipoprotein; LDH, lactate dehydrogenase; LDL, low-density lipoprotein.
[a]Values expressed as mean (SD).

of psoriatic arthritis.[21] Indeed, extensive involvement might be associated not only with more severe forms of psoriasis and longer disease duration,[4] but also with enthesitis, polyarticular involvement, and progressive arthritis.[22] Indeed, histology studies, high-resolution ultrasound, and nuclear magnetic resonance have all shown that the nail is part of the musculoskeletal system, and is connected, both anatomically and functionally, to the distal interphalangeal joint.[23-25] Furthermore, several authors consider the enthesis to be the centerpoint of the inflammatory process, which leads to effects in cartilage and bone as well as in the nail matrix and the nail bed (via extensor tendon fibers attached to the matrix and lateral ligaments that connect the tendon, the nail bed, and the periosteum).[17,25] This subclinical enthesitis would also explain why patients with psoriasis but not psoriatic arthritis develop nail pain, and it might also explain why nail involvement is associated with a greater risk of psoriatic arthritis, as has been suggested by previous studies.[26-28] Nevertheless, not all authors have found a correlation between the presence of nail psoriasis and the severity of psoriatic arthritis.[29-31] Others, such as Williamson et al[32] have identified a link between the severity of nail dystrophy and that of joint disease. It has indeed been postulated that nail involvement in psoriasis could serve as a marker for increased immunoreactivity, which would lead to onset of psoriatic arthritis in certain patients.

In a recent study, Scarpa et al[33] suggested that almost all patients with psoriatic arthritis have nail involvement, even though it is not always clinically evident. The results of that study again suggested that nail involvement might be a marker of disease in the distal interphalangeal joint.

In our group of patients, psoriatic arthritis was present in 29.7% of patients with nail disease and 11.5% of those without. Also, of the patients with psoriatic arthritis (133), 69.9% had nail disease. Augustin et al[14] reported similar results (26% and 12% for those with and without nail involvement, respectively). Nonetheless, the percentage

of nail dystrophy in patients with psoriatic arthritis in our group was slightly lower than that reported elsewhere.[4]

Contrasting with most reports in the literature, we found a high percentage of family history of psoriasis in our patients (53.7% and 42.8% in those with and without nail involvement, respectively). Our data, thus, are similar to those reported by Augustin et al[14] (Figure 2).

Furthermore, 231 (74%) of the patients with nail involvement in our study had early-onset psoriasis (<40 years), compared to 227 (65.4%) of those without nail involvement (OR, 1.51; 95% CI, 1.08-2.11; *P*=.018). These data are also similar to those reported by Augustin et al,[14] indicating a longer duration of disease in patients with nail psoriasis.

The presence of nail disease in our patients was associated with more severe clinical manifestations, with 161 patients in the nail-psoriasis group (51.4%) scoring over 10 on the PASI compared to just 107 patients (30.7%) in the control group (OR, 2,39; 95% CI, 1.74-3.28; *P*<.001). According to our data, thus, nail psoriasis appears to be a risk factor for the development of more severe forms of psoriasis (Figure 1).[4,14,34] This observation, however, is not supported by findings of a study of Chinese patients.[18]

We also found a link between nail psoriasis and body weight. Specifically, 31.6% of patients with nail involvement and just 23.9% of those without had a BMI of over 30 (OR, 1.47; 95% CI, 1.05-2.08). In our review of the literature, we found just 1 study that has analyzed the relationship between BMI and nail psoriasis.[35] The study, performed in Han Chinese patients, did not find a statistically significant association between the 2 variables. Nonetheless, the findings of that study and ours are probably not comparable as the prevalence of nail involvement in Asian patients with psoriasis is surprisingly low (<2%).[35] It is also of note that waist circumference was larger in patients with nail psoriasis than in those without. This was the case when the groups were compared according to the ATP III component measure for diagnosing metabolic syndrome and according to mean circumference measurements. On comparing mean waist circumference by sex, we saw that the differences were due to the subgroup of women.

Finally, although 25.2% of patients with nail psoriasis and 22.4% of those without had metabolic syndrome, the difference was not significant.

We found no differences between patients with and without nail psoriasis for hypertension, type 2 diabetes mellitus, cardiovascular events, dyslipidemia, smoking, or alcohol consumption (data not shown).

The main limitation of our study is that we did not collect data to distinguish between nail matrix and nail bed involvement in patients with nail disease. Love et al[36] found that of all the clinical forms of nail psoriasis they analyzed, only onycholysis was associated with joint involvement; the main limitation of that study, however, was the small sample size. Gudjonsson et al,[1] in contrast, found that all 4 parameters analyzed (onycholysis, nail pitting, subungual hyperkeratosis, and nail dystrophy) were associated with psoriatic arthritis. Another limitation is the fact that we conducted a prevalence study. Accordingly, the association detected between nail psoriasis and other parameters might be due to an increased incidence of nail disease or indeed to the fact that this disease had been present for longer (chronic nail psoriasis), either because of the natural history of the disease or because the patients had received no treatment or had received less efficient treatment. Our results are also limited by the fact that we did not analyze toe-nail involvement. Similarly to other studies,[1] we chose not to analyze toe nails due to the high prevalence of onychomycosis in patients with nail psoriasis[37] as the clinical features of both conditions are similar.

Based on the data from the present study, a typical patient with nail psoriasis would be a man (60.1%), have an age of onset of psoriasis of before 40 years (74%), as well as a history of psoriasis among first-degree relatives (54%), psoriatic arthritis (29.7%), moderate to severe disease (51.4%), and a BMI of over 30 (31.6%).

Until further studies are conducted on the value of nail psoriasis as a marker of the severity of skin disease, probable clinical and subclinical enthesitis, and possible cardiovascular risk (BMI >30), the importance of this clinical form of psoriasis, which has been mentioned as the most common comorbidity in psoriasis,[38] should not be underestimated

Conflict of Interest

The authors declare that they have no conflict of interest.

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