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Research Article

Correlation Between the Type of Psoriasis and the Pattern of Arthritis Among Patients with Psoriatic Arthritis: A Single-center Cross-sectional Study

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Abstract

Background: Psoriatic arthritis (PsA) is an inflammatory condition linked to psoriasis. According to studies, there is little correlation between arthritic patterns and PsA. ***Objective***: To find relationships between psoriasis symptoms and PsA arthritis patterns. ***Methods***: 100 PsA patients were enrolled in a cross-sectional study at Baghdad Teaching Hospital from December 2021 to June 2022, using CASPAR criteria. We gathered thorough demographic and clinical information, examined arthritis patterns, classified them into five kinds, and evaluated eight types and sites of psoriasis. Disease activity was measured using clinical and psoriasis indicators. ***Results***: a weak negative connection among 100 individuals with psoriatic arthritis, plaque psoriasis, and distal interphalangeal (DIP) arthropathy. Erythrodermic psoriasis and spondylitis (with or without sacroiliitis) showed a slight positive connection. There was also a slight positive association between scalp psoriasis and DIP arthropathy. A comparable positive and weak relationship was found between polyarthritis and age, as well as polyarthritis and psoriatic arthritis disease activity. In contrast, asymmetrical oligoarthritis and PsA disease activity had a modest negative connection. Furthermore, enthesitis and DIP arthritis showed a weak negative connection. Body mass index and spondylitis (with or without sacroiliitis) showed a positive and weak correlation. The most significant finding was a modestly favorable relationship between skin psoriasis and psoriatic arthritis disease activity. ***Conclusions***: There are weak but significant associations between particular psoriasis types and locales and arthritis patterns in PsA patients. These findings point to the possibility of developing individualized therapeutic regimens for PsA that take into account both dermatological and rheumatological signs.

Keywords: Psoriasis, Pattern of arthritis, Psoriatic arthritis, Type of psoriasis.

العلاقة بين نوع الصدفية و نمط التهاب المفاصل عند مرضى التهاب المفاصل الصدفي في عينة من المرضى العراقيين

الخلاصة

الخلفية: التهاب المفاصل الصدفي هو التهاب مفاصل رثوي مرتبط بالصدفية وعادة ما يكون سلبيًا لعامل الروماتويد. **الهدف:** تحديد مدى العلاقة بين نوع الصدفية و نمط التهاب المفاصل عند مرضى التهاب المفاصل الصدفي وتحليل الملامح الديموغرافية والسريرية للمرضى. **الطرائق:** دراسة مقطعية أجريت في عيادة المرضى لقسم الروماتيزم، مستشفى بغداد التعليمي، مدينة الطب في مدينة بغداد - العراق في فترة ستة أشهر منذ كانون الأول ٢٠٢١ و حتى ٣١ حزيران ٢٠٢٢ على عينة من ١٠٠ مريض مصاب بالتهاب المفاصل الصدفي بناءً على معايير CASPAR. جمعت الدراسة بيانات ديموغرافية وسريرية مفصلة، وقيمت أنماط التهاب المفاصل، وصنفتها إلى خمسة أنواع، وقيمت ثمانية أنواع/مواقع من الصدفية. تم قياس أنشطة المرض باستخدام المؤشرات السريرية والصدفية. **النتائج:** من بين مائة مريض مصاب بالتهاب المفاصل الصدفي، هناك ارتباط ضعيف سلبي بين الصدفية اللويحي والتهاب المفاصل القاصي، كذلك هناك ارتباط ضعيف إيجابي بين الصدفية المحمرة للجلد والتهاب الفقار مع أو بدون التهاب المفصل العجزي الحرقفي و وجود ارتباط ضعيف إيجابي بين صدفية فروة الرأس والتهاب المفاصل القاصي، بينما أظهر ارتباط التهاب المفاصل الصدفي بالبيانات الديموغرافية ارتباطًا إيجابيًا ضعيفًا بين نمط التهاب المفاصل المتعدد والعمر، كما ارتبط التهاب المفاصل الصدفي ارتباط إيجابي ضعيف بشكل ملحوظ مع نشاط مرض التهاب المفاصل الصدفي، بينما كان هناك ارتباط سلبي ضعيف بين نمط التهاب المفاصل القليلة مع نشاط مرض التهاب المفاصل الصدفي. كان هناك ارتباط اسلبي ضعيف بين التهاب الأرتكاز و التهاب المفاصل القاصي. و تبين وجود ارتباط ايجابي ضعيف بين مؤشر كتلة الجسم ونمط التهاب الفقار مع او بدون التهاب المفصل العجزي الحرقفي. كان هناك ارتباط إيجابي معتدل بين نشاط الصدفية الجلدية ونشاط التهاب المفاصل الصدفي حيث ان كان هناك التهاب مفاصل أكثر نشاطًا في المرضى الذين يعانون من الصدفية الجلدية الأكثر شدة. **الاستنتاجات:** ان نوع أو مكان صدفية الجلد له علاقة ضعيفة و لكن مهمة بنمط التهاب المفاصل لدى مرضى التهاب المفاصل الصدفي. تشير هذه النتائج إلى طرق محتملة لاستراتيجيات علاج مصممة خصيصًا لمرض التهاب المفاصل الصدفي، مع الأخذ في الاعتبار الأعراض الجلدية والروماتيزمية.

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INTRODUCTION

As an inflammatory arthropathy that is frequently linked to psoriasis and is usually negative for rheumatoid factor, psoriatic arthritis (PsA) belongs to the spondyloarthropathy family [1]. Remarkably, psoriasis frequently develops seven to eight years before arthritis [2]. Five traditional PsA categories were first identified by Moll and Wright; these have since been expanded upon in the CASPAR study to include a breakdown of disease pattern subtypes. This showed that, in contrast to 13% of patients who present with oligoarticular disease, roughly 63% of patients have polyarticular joint involvement. Less than 5% of cases have spondylarthritis and dominant distal interphalangeal (DIP) illness [3–5]. Along with newly created indices, especially for PsA, activity indices and remission criteria from rheumatoid arthritis (RA) are commonly utilized for PsA. The Disease Activity Score in 28 Joints (DAS28), Psoriatic Arthritis Screening and Evaluation (PASE), Disease Activity Index for Psoriatic Arthritis (DAPSA), Simplified Disease Activity Index (SDAI), and Clinical Disease Activity Index (CDAI) are a few of these. These indices have shown strong connections among themselves, despite having various classifications for different patients [6]. The most prevalent variety of psoriasis on the skin is called plaque psoriasis, which usually manifests as erythematous plaques coated in peeling, silvery scales [7]. Additional forms include erythrodermic psoriasis, which affects more than 75% of the body's surface area [9], severe but uncommon generalized pustular psoriasis [10], and guttate psoriasis, which is characterized by tiny "drop-like" lesions [8]. The hallmark of scalp psoriasis is red, thicker plaques with a silver-white scale that are frequently encountered in conjunction with other kinds [11]. Additional variations include nail psoriasis, palmoplantar psoriasis, and flexural psoriasis, which affect 10-15% of psoriasis patients and are closely linked to PsA [12–14]. Notably, nail involvement occurs in 80–90% of PsA patients [15]. The study intends to analyze the association between clinical and demographic features in PsA patients as well as the correlation between particular types or areas of psoriasis and patterns of arthritis.

METHODS

Study design and setting

We conducted this cross-sectional study at the Rheumatology Unit of Baghdad Teaching Hospital, Medical City, from December 2021 to June 2022. We included 100 consecutive patients with psoriatic arthritis (PsA).

Inclusion criteria

Patients aged 18 years or older, diagnosed with PsA according to CASPAR criteria regardless of gender or disease duration, were either attending the outpatient rheumatology clinic for follow-up or receiving treatment at the hospital during the study period.

Exclusion criteria

Patients with arthritis due to other causes or overlap with other rheumatological diseases, as determined by medical history, physical examination, laboratory tests, and radiographs.

Data collection

We collected data from patients at the rheumatology clinic using a standardized form. Information gathered included demographics (age, gender, height, weight), age at PsA and skin psoriasis diagnosis, comorbidities, family history of psoriasis, and current treatments. We categorized arthritis patterns into five types and conducted assessments for dactylitis, enthesitis, and disease activity using the Clinical Disease Activity Index. The dermatology clinic classified psoriasis types and sites into eight categories, using the Psoriasis Area and Severity Index (PASI) score to assess the severity of skin psoriasis.

Ethical considerations

The study protocol was approved by the Iraqi Board for Medical Specializations (Document No. 269, dated January 19, 2022). Written informed consent was obtained from all participants.

Statistical analysis

Data analysis was performed using IBM SPSS Statistics version 27. Descriptive statistics (frequency, percentage, mean, standard deviation, and range) were used. For inferential statistics, the Student's *t*-test was applied for comparing two independent means, the paired *t*-test for paired observations, and the ANOVA for more than two independent means. Pearson's correlation (two-tailed) was calculated to assess relationships between two quantitative variables, along with a significance test for the correlation coefficient (*r*), indicating either a positive or negative correlation. A *p*-value of <0.05 was considered for significant differences.

RESULTS

This study comprised one hundred patients with psoriatic arthritis.

Table 1: Baseline characteristics, disease duration, and severity in 100 patients (*n*=100)

Parameter	Patients with PsA
Females	54(54)
Males	46(46)
Age (year)	43.69±14.12
BMI (kg/m²)	30.580±6.1
Age at onset of skin lesions (year)	25.21
Age at onset of PsA (years), mean	33.11
Duration of PsA (year)	11 (1-48)
Psoriasis before arthritis	65
Simultaneous onset	20
Arthritis before psoriasis	15
Family history of psoriasis	38
CDAI	13.14 (2-61)
PASI	4.29 (0.3-43)

Values were expressed as frequency, percentages, range, and mean±SD. n: number of cases; PsA: Psoriatic arthritis. BMI: Body mass index. CDAI: Clinical disease activity index. PASI: Psoriasis area and severity index.

Table 1 displays age, gender distribution, and several clinical attributes. The patients had a mean age of 43.69±14.12 years, a body mass index of 30.5±6.1 kg/m2, and a gender distribution of 54 females (54%) and 46 males (46%). When psoriasis was diagnosed, the average age was 25.21 years, and when PsA was diagnosed, the average age was 33.11 years. Three-quarters of PsA patients had a positive family history of psoriasis, with a mean gap of 7.9 years between psoriasis and arthritis. Table 2 presents the correlation between the type of psoriasis and the pattern of arthritis in patients with psoriatic arthritis. A significant negative-weak correlation was found between plaque psoriasis and DIP arthropathy (p=0.006), while erythrodermic psoriasis and spondylitis with or without sacroiliitis (p=0.017) showed a significant positive-weak correlation. Finally, there was a significant positive, weak correlation between scalp psoriasis and DIP arthropathy (p=0.034).

Table 2: The correlation between the type of psoriasis and the pattern of arthritis among psoriatic arthritis patients

Variables	Polyarthritis		Spondylitis with or without sacroiliitis		Distal interphalangeal joint		Asymmetrical oligoarticular	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Plaque psoriasis	-0.023	0.824	0.066	0.513	-0.274	0.006	0.128	0.203
Pustular	0.145	0.152	-0.061	0.551	-0.033	0.745	-0.090	0.375
Nail	-0.102	0.312	0.057	0.572	0.187	0.062	-0.014	0.893
Inverse psoriasis	0.101	0.32	-0.042	0.677	-0.023	0.820	0.536	-0.063
Erythrodermic	-0.101	0.32	0.239	0.017	-0.023	0.820	-0.063	0.536
Guttate psoriasis	-0.046	0.65	0.032	0.751	0.158	0.117	-0.041	0.686
Scalp	0.032	0.752	-0.148	0.143	0.213	0.034	-0.006	0.955
Palmoplantar	0.143	0.143	-0.060	0.060	-0.033	0.033	-0.091	0.091

r-value of 0.2-0.4 is considered of low significance, between 0.40.6 is considered moderately significant, and >0.6 is considered highly significant.

Table 3 indicates that patients with erythrodermic psoriasis with spondylitis, with or without sacroiliitis, had a significant negative weak correlation to the age at the time of PsA diagnosis (p<0.05), and patients with plaque psoriasis and DIP arthropathy had a significant positive weak correlation.

Table 3: The Correlation between clinical characteristics and type of psoriasis in psoriatic arthritis

Clinical characteristics	Plaque psoriasis with DIP arthropathy		Erythrodermic psoriasis with (spondylitis+/- sacroiliitis)		Scalp psoriasis with DIP arthropathy	
	r	*p*	*r*	*p*	*r*	*p*
Age at the time of diagnosis of psoriasis	0.118	0.243	-0.070	0.491	-0.183	0.068
Age at the time of diagnosis of PsA	0.291	0.003	-0.201	0.044	-0.111	0.271
CDAI	-0.050	0.647			0.106	0.330
PASI	0.166	0.105	0.184	0.071	-0.150	0.143
Nail involvement	-0.112	0.267	0.189	0.059	0.045	0.658
Dactylitis	0.059	0.560	-0.060	0.556	0.097	0.337
Enthesitis	0.070	0.491	-0.140	0.163	0.119	0.236
Uveitis	0.003	0.978	-0.037	0.716	-0.129	0.201

CDAI: Clinical disease activity index. PASI: Psoriasis area and severity index. *r*-value of 0.2-0.4 is considered of low significance, between 0.4-0.6 is considered moderately significant, and >0.6 is considered highly significant.

Figure 1 depicts the distribution of the various forms and locations of skin disease.

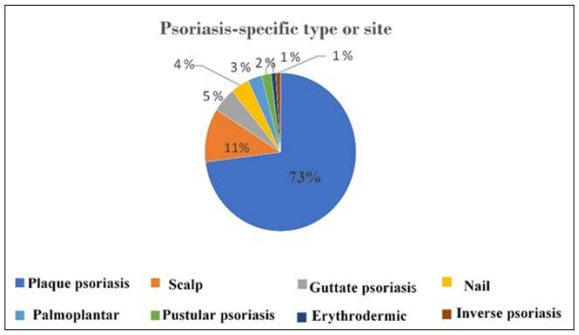

Figure 1: psoriasis-specific type or site among patients with psoriatic arthritis.

Plaque psoriasis accounted for 73% of cases of psoriasis, including scalp psoriasis (11%), guttate psoriasis (5%), nail psoriasis (4%), palmoplantar psoriasis (3%), pustular psoriasis (2%), erythrodermic psoriasis (1%), and inverse psoriasis (1%). The PASI score was used to quantify the severity of skin involvement, and the mean value was 4.29±0.343.

In Figure 2, the PsA pattern is displayed. When the rheumatology unit's patients were examined, polyarthritis accounted for 50% of the cases, with asymmetrical oligoarticular (30%), spondylitis with or without sacroiliitis (15%), and DIP arthropathy (5%). This study did not record any occurrences of arthritis mutilans.

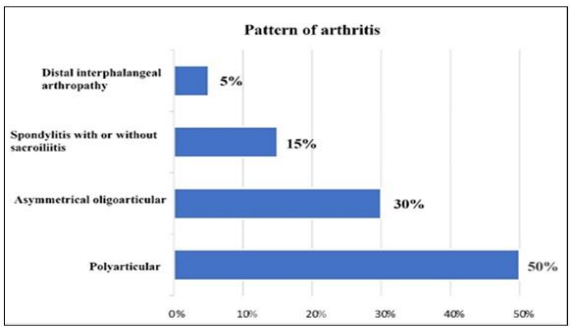

Figure 2: The pattern of arthritis among patients with psoriatic arthritis.

Of the patients, 72 had a prevalence of enthesitis (72%), 28 had dactylitis (28%), and 13 had uveitis (13%). The arthritis disease activity was found to be moderately severe in individuals based on a CDAI score of 13.14±0-61. In terms of therapy alternatives, 77% of individuals with psoriatic arthritis rely on their PsA regimen for their skin condition.

Figure 3 illustrates the available treatments for psoriatic arthritis and cutaneous psoriasis. Skin psoriasis can be treated with a range of medications, including biological agents, acitretin, UVB (ultraviolet B-rays), and cDMARDs. Eighty patients were treated with biological therapies for PsA, either on their own or in conjunction with NSAIDs or a cDMARD. The remaining patients received cDMARDs, NSAIDs, or both at the same time.

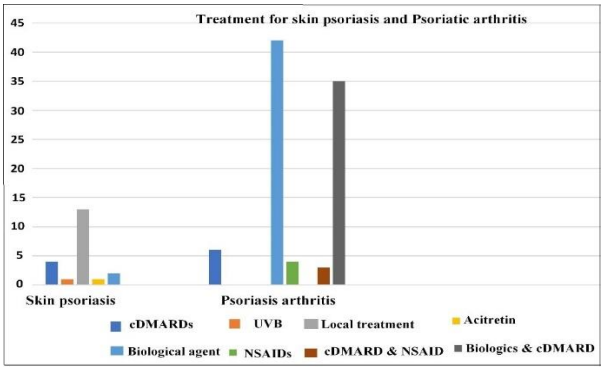

Figure 3: Treatment options for skin psoriasis and psoriatic arthritis. cDMARDs: conventional disease-modifying antirheumatic drugs. UVB: ultraviolet B-rays. NSAIDs: non-steroidal anti-inflammatory drugs.

A substantial statistical correlation as well as a significant link between age and polyarthritis (p<0.05) were found when PsA patterns were correlated with demographic and clinical factors. polyarthritis and CDAI (p>0.05), but there was no statistically significant association found between polyarthritis and any other clinical or demographic factors. There was no significant link detected for any other demographic or clinical parameter; however, a statistically significant correlation (p<0.05) was discovered between CDAI and asymmetrical oligoarthritis. Although enthesitis and DIP arthritis showed a statistically significant association (p<0.05), no meaningful correlation was seen with any other clinical or demographic feature. It was discovered that there was no significant link between body mass index and any other clinical or demographic feature, although there was a statistically significant correlation between body mass index and spondylitis with or without sacroiliitis (p<0.05). The severity of skin psoriasis was assessed using the PASI score, which has a mean of 4.29 (0.3–43). The CDAI score, which has a mean of 13.14 (0–61), was used to assess PsA activity. As seen in Figure 4, the correlation coefficient between the two parameters was found to be statistically significant (p<0.05), with a correlation value of 0.43.

DISCUSSION

Close cooperation between the rheumatologist and dermatologist is necessary for the diagnosis of PsA. As soon as arthritis is suspected, the dermatologist must promptly refer the patient for a rheumatological evaluation. Determining whether there is any association between the type of psoriasis and the patterns of arthritis could improve the understanding, early diagnosis, and management of this debilitating condition.

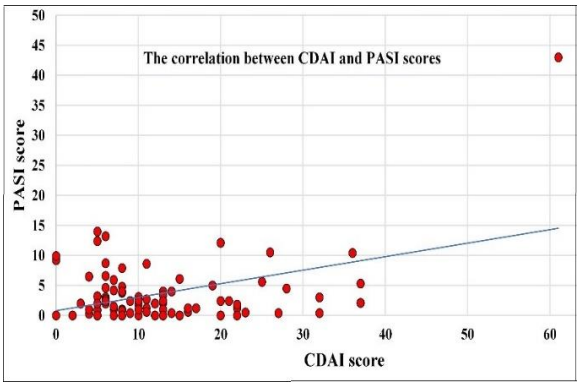

Figure 4: The correlation between CDAI and PASI scores, r=0.43, p=0.00011. PASI: Psoriasis area and severity index. CDAI: clinical disease activity index.

The purpose of this study was to determine whether there is any relationship between any particular type or location of psoriasis and any patterns of arthritis in individuals with psoriatic arthritis. The results of this cross-sectional study showed that there was a significant positive weak correlation between erythrodermic psoriasis and spondylitis with or without sacroiliitis, a significant positive weak correlation between plaque psoriasis and DIP arthropathy, and a significant positive weak correlation between scalp psoriasis and DIP arthropathy. It has never been demonstrated before that there is a statistically significant, weak negative connection between DIP and plaque psoriasis. Even though DIP arthritis is regarded as the typical form [17], and plaque psoriasis is the most prevalent type of skin psoriasis [16], it is still not the most common pattern of PsA [18]. There was no discernible link between DIP arthropathy and plaque psoriasis in a German study involving patients with both conditions. Any patient who has both DIP involvement and other PsA signs is considered to have DIP arthritis [19]. Although patients with exclusive DIP arthritis were included in this investigation to identify the DIP pattern rather than individuals with any pattern + DIP involvement, this may help explain why the two studies' results differed. At the time of PsA diagnosis, these individuals also exhibited a substantial positive-weak connection with age. Deike *et al*. reported that PsA increased steadily with age until it peaked just before the age of 60, but they did not specify which form of PsA was responsible for this rise [20]. With respect to erythrodermic psoriasis, a small but statistically significant positive connection was observed between erythrodermic psoriasis and spondylitis, whether or not sacroiliitis was present. Although erythrodermic psoriasis is regarded as a severe form of skin psoriasis [9], Mease *et al*. did not address any association with a specific type or place

of skin psoriasis in their study [21], despite the fact that they did highlight a relationship between axial involvement and more severe skin illness. In line with the findings of Durcan *et al*. [22], who discovered that patients with axial involvement tend to be younger, these patients likewise exhibit a modest, statistically negative connection with age at the time of PsA diagnosis. This study clearly shows a weak but substantial positive connection between DIP arthropathy and scalp psoriasis. Wright et al. additionally identified a higher frequency of scalp involvement in individuals with distal joint illness, even though there was no significant link with age at the time of PsA diagnosis [23]. There may not be a relationship between the type of psoriasis and the pattern of arthritis, according to Jones *et al*. Psoriasis was categorized in the study as psoriasis vulgaris, discoid, guttate, localized pustular, or a combination of these categories, whereas PsA was classified as monoarticular, oligoarticular, polyarticular, DIP arthropathy, and axial illness. These categories differ from the ones applied in this study. Additionally, Jones *et al*.'s PsA classification placed axial disease, DIP arthropathy, oligoarticular, polyarticular, and monoarticular arthropathy alongside psoriasis. Skin psoriasis classification does not include erythrodermic psoriasis, inverse psoriasis, or scalp psoriasis [24]. Jones *et al*. used a PsA classification that includes monoarticular disease as a distinct pattern [24]. Vulgaris, discoid, guttate, localized pustular, or a combination of these categories are classifications that differ from the one used in this study. Although PsA is divided into five subsets by Moll and Wright [1], some of these subsets are interchangeable (oligoarthritis can become polyarthritis and vice versa) [19], and combining polyarthritis and oligoarthritis into a single PsA subset may have variable outcomes. The results of this study, which showed notably modest associations between specific forms of skin psoriasis and some PsA patterns, will aid future investigations into the possibility of uncovering additional factors that may be more closely associated with the pattern of arthritis in PsA patients. PsA pattern and clinical and demographic characteristics: the average interval between psoriasis and PsA in patients was 7.9 years; a study conducted in Libya confirms this interval, with an average of 8 years [25]. The fact that older patients had a longer disease duration [26], and polyarthritis has been proven to be a long-standing condition [27], may help to explain the finding of a weak positive connection between age and the disease. Using the CDAI score, asymmetrical oligoarticular arthritis was linked to a statistically weak negative association with CDAI, whereas polyarthritis was related to a considerably weak positive connection with PsA disease activity. This may just indicate that the number of sore and swollen joints influences a portion of the CDAI score [28]. In individuals with more severe skin psoriasis, the current study demonstrated a substantial, somewhat favorable link between skin psoriasis activity as defined by the PASI score, PsA disease activity as determined by CDAI, and more active joint disease. There were two other investigations that yielded almost similar results, ranging from a moderate to a highly significant connection [25,29]. There is a substantial, weak positive link between BMI and spondylitis patients; however, no research has been done to examine this finding in individuals with psoriatic arthritis. The identical conclusion was reached by Durcan *et al*. with AS patients [22]. The study found no significant correlation between PsA-specific patterns and any of the following clinical characteristics: dactylitis, enthesitis, uveitis, disease activity (as measured by the CDAI score), severity of skin psoriasis (as measured by the PASI score), nail involvement, or treatment for skin psoriasis or PsA. Additionally, there was no significant correlation between the two variables—patients' comorbidities or the management of skin psoriasis, or PsA. One of the most important clinical characteristics to discuss is the relationship between nail involvement and PsA pattern; Lai *et al*. reviewed prior research on nail psoriasis, and the nail involvement in DIP arthritis was evident [30]. The study's finding of a weak positive correlation may have resulted from the smaller sample size than other studies. variances between this study and others may be explained by variances in ethnic and geographic backgrounds as well as different classification systems for psoriasis and arthritis.

Limitations of the study

This study is cross-sectional, so it's possible that some patients may have distinct arthritis patterns when they initially arrive. Additionally, people may change their arthritis over time, going from oligoarthritis to polyarthritis. As a result, this cross-sectional study may have overlooked some cases in which this occurred. Furthermore, psoriatic arthritis may develop concurrently with or subsequent to cutaneous psoriasis; however, this study does not examine the potential impact of this on the association between psoriasis and psoriatic arthritis.

Conclusion

There is little correlation between the type of psoriasis and the arthritis pattern. Additionally, there is little association between psoriatic arthritis patients' clinical and demographic features. A multicenter prospective study with a broader population may reduce confounding variables and produce different findings. We are currently searching for additional laboratory data, such as those from molecular or HLA testing, that may be better correlated with the pattern of arthritis.

Conflict of interests

No conflict of interests was declared by the authors.

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The authors did not receive any source of fund.

Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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