ORIGINAL ARTICLE

Clinical and epidemiologic features of psoriasis patients in an Egyptian medical center

Mohamed Hussein Medhat El-Komy, MD,[a,b] Heba Mashaly, MD,[a,b] Khadiga S. Sayed, MD,[a,b]
Vanessa Hafez, MD,[a,b] Marwa S. El-Mesidy, MD,[a,b] Eman R. Said, MD,[a,b] Marwa A. Amer, MD,[a,b]
Aya M. AlOrbani, MD,[a,b] Dina G. Saadi, MD,[a,b] Mona El-Kalioby, MD,[a,b] Reem O. Eid, MSc,[a,b]
Yousra Azzazi, MSc,[a,b] Hagar El Sayed, MD,[a,b] Nesrin Samir, MD,[a] Marwa R. Salem, MD,[c]
Eman D. El Desouky, MD,[d] Hesham Abd El-Moaty Zaher, MD,[a,b] and Hoda Rasheed, MD[a,b]
Cairo, Egypt

Background: Identification of epidemiologic and phenotypic variations of psoriasis among different ethnic groups can further our understanding of this perplexing disease, aiming at better management of patients worldwide.

Objective: To provide a descriptive analysis of psoriasis patients registered at Kasr Al-Ainy Psoriasis Unit Disease Registry.

Methods: This retrospective single-center registry study included patient records between November 2015 and November 2018 (2534 patients). Sociodemographic and phenotypic data were analyzed.

Results: The mean age of the registered patients was 39.3 years and 56.3% were men. Stress was the main precipitating factor (48.3%), whereas the most common symptom reported was itching (82.4%). The median body mass index was 27.5, and the median percentage of body surface area involved was 10.0. The mean Psoriasis Area Severity Index score was 8.7, and the mean Psoriasis Disability Index score was 13.0. Both parameters correlated positively, and both showed significantly higher means in smokers.

Limitations: Despite that the study was performed at a highly specialized tertiary care center with a high flow of patients, this was still a single-center registry.

Conclusions: This work shows that the characteristics of Egyptian patients with psoriasis are comparable to those of other studied ethnic groups, with minor differences. (JAAD Int 2020;1:81-90.)

Key words: ethnic groups; pruritus; psoriasis; registry; retrospective studies.

INTRODUCTION

Psoriasis is a chronic, immunomediated, polygenic, inflammatory dermatosis affecting 1% to 3% of the general population.[1,2] It is a lifelong disease with a negative effect on patients' quality of life.[2] Although the exact causes of psoriasis are not fully understood, several risk factors are recognized, including family history and environmental risk factors, such as smoking, stress, and obesity.[3]

Not only can psoriasis be highly variable in morphology, distribution, and severity[4] but also there is a considerable difference in the incidence of disease because of environmental, genetic, and geographic factors. Various national and

international patient registries have been established for proper documentation and follow-up of psoriasis patients. These registries are located in Europe, Malaysia, the North America, United States, the American continent, Australia, and Israel.[5] Data and information regarding the epidemiologic and clinical characteristics of psoriasis in Egypt are severely lacking. This work aimed to provide a descriptive analysis of more than 2500 Egyptian psoriasis patients.

PATIENTS AND METHODS

Study setting and design

This single-center, retrospective, observational, registry-based study was conducted at Kasr Al-Ainy's Psoriasis Unit. The unit is specialized and affiliated with the Department of Dermatology, Kasr Al-Ainy hospitals, Faculty of Medicine, Cairo University, which was established in November 2015 and is one of the earliest and largest specialized psoriasis clinics in Egypt. Since then, the unit has served and registered more than 3200 psoriasis patients, whether outpatients or inpatients. The Kasr Al-Ainy Psoriasis Unit Disease Registry database provides a wealth of information regarding various aspects of psoriasis, including demography, epidemiology, disease characteristics, management, and therapeutic response of the Egyptian patients.

Patient population

Data were collected from the records of 2534 psoriasis patients between November 2015 and November 2018 who had been registered in the Kasr Al-Ainy Psoriasis Unit Disease Registry database.

Data collection

The registry variables used in this study are detailed in Table I.

Ethical considerations

The Dermatology Research Ethical Committee reviewed and approved the study protocol. The need for consent was waived according to institutional regulations for observational studies. The study followed the principles of the declaration of Helsinki.

CAPSULE SUMMARY

- Psoriasis varies in epidemiology, morphology, distribution, and severity among ethnic groups. This study describes psoriasis characteristics in 2534 patients who received a diagnosis at a tertiary care center.

- Higher frequency of pruritus and lower frequency of positive family history were prominent differences compared with other ethnic groups. Sun exposure was an unexpected precipitating factor.

Statistical analysis

Data entry and analysis were carried out with SPSS (version 24.0, SPSS Inc IBM, Chicago, IL). All variables were checked for normality. Descriptive statistics were summarized as mean ± standard deviation or median (range) as appropriate. χ^2 Test was used to assess group differences for categoric variables and the Student t test was used to assess differences between continuous variables. A comparison of nonparametric data was performed with the Mann-Whitney U test. Missing data when less than 5% were considered to be missing completely at random, and this was tested statically because it was not different from the recorded data. All statistical testing was 2 tailed, with a significance level of ≤ .05.

RESULTS

From November 2015 to November 2018, a total of 2534 psoriasis patients were included in the study. The mean age of the study group was 39.3 ± 17.9 years (range 1-94 years), with men representing 56.3% of patients. Positive family history was reported in 23.1% and 26.9% were smokers.

The main precipitating factors reported by the patients were stress (48.3%), followed by cold (39.7%) and sunlight (15.4%). Other less common precipitating factors included infections (4.6%), drugs (2.6%), trauma, and food (0.2% each). More than one-quarter of the study group reported no precipitating factors (26.4%).

The mean disease duration was 106.6 ± 60.0 months. The most common phenotype of psoriasis in the current study was plaque psoriasis (84.1%), followed by guttate psoriasis (10.3%), whereas other less common types included chronic palmoplantar pustulosis and pustular psoriasis (1.8%). Associated symptoms, affected sites, and psoriasis phenotypes of studied patients are listed in Table II. Anthropometric measurements and disease severity among the studied psoriasis patients are listed in Table III.

Relevant demographic and clinical characteristics and anthropometric differences between men and women are presented in Tables IV and V.

The Psoriasis Area Severity Index (PASI) score ranged from 0.1 to 60.4, with a mean of 8.7 ± 0.09, whereas the mean Psoriasis Disability Index (PDI)

score was 13.0 ± 10.0 (range 0 to 45). There was a statistically significant positive correlation between PDI and PASI scores (r = 0.421; P < .001). PDI score was also positively correlated with extent of disease (r = 0.397; P < .001). PASI score was significantly higher in patients on whom psoriasis exerted a major influence in their daily lives (P < .001). The baseline median PASI and PDI scores among smokers (7.6 and 14, respectively) were significantly higher (P < .001) than for nonsmokers (4.8 and 10, respectively). Patients complaining of pruritus had a higher median PASI score than those without pruritus, and the difference was statistically significant (P < .001).

Baseline PASI correlated positively with patients' age, duration of illness, extent of illness, and PDI score (Supplemental Table I). Additional analyses exploring the relation to smoking, skin tenderness, and hepatitis C virus (HCV) infection are displayed in Supplemental Tables II and III and discussed later.

DISCUSSION

In the northern African and Middle East areas, a few studies[11,12] have reported sociodemographic criteria of psoriasis, but they have not yet been reported in Egypt, where an estimated 500,000 persons are affected by psoriasis.[13] To our knowledge, this is the largest Egyptian single-center registry analysis to date describing the characteristics of more than 2500 Egyptian psoriasis patients. This study is in line with the worldwide increasing interest in defining regional specificities of psoriasis, particularly in low- and middle-income countries, where epidemiologic studies are lacking, to better identify and address health needs in each country.[13]

The percentage of patients with psoriasis among all dermatology patients attending our outpatient skin clinic from November 2015 until November 2018 was 1.3%, which was higher than that reported from clinics in several West African countries (0.05%-0.9%), almost half that reported in a Nepali dermatology clinic (2.9%), and much lower than that reported in a Turkish clinic (5.5%).[6-8] The sociodemographic characteristics of our patients were comparable to those of patients from Asian countries such as Nepal and Malaysia. Male predominance (56%) was similar to that reported from Nepal, Maghreb, and Malaysia (53.7%, 55.7%, and 56.6%,

respectively).[2,7,11] In contrast, a female predominance was reported by some Western counties such as Denmark (53.2%) and in Minnesota.[8-10]

In accordance with previous reports,[11] the mean age at onset was 30.5 years, with 69.8% of patients classified as having type 1 psoriasis, 14.2% of whom were younger than 16 years. This was minimally different than onset at aged 26.4, 29.1, 33.6 to 33.4, and 35.1 years in Nepal, Spain, Italy, and Malaysia, respectively.[2,7,14,15] Regardless of disease onset, we observed an increase in PASI score with both the age of the patient and the duration of disease (P < .001). In concordance with a UK population-based study and Chinese nationwide and Italian surveys,[15-17] the mean age of onset of psoriasis in our female patients was significantly lower than that in male patients.

Family history of psoriasis, which is considered one of the risk factors for the development of the disease,[3] was present in 17.5% of our patients. This is lower than the percentage in studies carried out in Italy, Spain, Maghreb, China, and Malaysia, which reported family history for 45.9%, 40.7%, 28.6%, 23.1%, and 23.1% of patients, respectively.[2,14-16,18] This may be due to cultural and social factors in which patients may deny affliction in their family. Such a denial may provide patients some reassurance regarding avoidance of social stigmatization and exclusion,[19,20] a fear that is even more accentuated by the local culture of the "perfect mate" to the extent that social network groups have been created by psoriasis patients to socialize for marriage purposes. Further investigation of the rate of family history is needed, ideally by family physicians for more accurate data.

A meta-analysis acknowledged the association between smoking and psoriasis prevalence as well as severity.[21] Earlier meta-analyses additionally reported more resistance to treatment among smokers compared with nonsmokers.[22,23] More than one-quarter of our patients (26.9%) were smokers, and those were mostly men (94%) whose baseline median PASI score was significantly higher than that of nonsmokers. Smoking was significantly more common among patients with plaque, nail, palmoplantar, and erythrodermic psoriasis compared with other types of psoriasis.

Psychological stress is associated with psoriasis exacerbation and may even trigger the onset of disease. It is estimated that 31% to 88% of patients report stress as a trigger for their psoriasis.[24,25] In our patients, 40.3% reported that stress was a precipitating factor. This percentage is comparable to that in data from China (34.5%) and Malaysia (48.3%) but is much lower than that reported in Maghreb (79.4%).[2,16,18]

Table I. Patients' data variables recorded in the Kasr Al-Ainy Psoriasis Unit Disease Registry database

Patient sociodemographic data	Anthropometric measurements	Psoriasis disease assessment
Patient ID	Weight	Disease onset, course, and duration, mo
Age	Height	Body sites currently affected
Sex	Body mass index	Site first affected
Occupation		Previous treatments and psoriasis response to them
Marital status		Family history of psoriasis
Residence		Symptoms (itching, dryness, skin tenderness)
Telephone number		Precipitating factors
Smoking		% of body surface area involved
Pregnancy		Baseline Psoriasis Area Severity Index score at first presentation to KAPU
The contraceptive method used if any		Psoriasis Disability Index score for adult patients

ID, Identification; *KAPU*, Kasr Al-Ainy Psoriasis Unit.

Psoriasis affected the activities of daily living of 83.8% of our patients. Higher baseline PASI score was associated with a significantly higher major effect on activities of daily living. This was further demonstrated by the positive correlation between PASI and PDI scores ($P < .001$) and between PDI and extent of disease ($P < .001$). Patients with erythrodermic psoriasis showed significantly higher PDI values compared with other subtypes.

Although sun exposure may have a positive clinical effect on psoriasis, presumably involving immunoregulatory mechanisms,[26] 15.8% of our patients reported sun exposure without sunburn as an exacerbating factor of their disease. Although often overlooked, worsening of psoriasis after sun exposure had been documented to occur in 5% to 20% of patients.[27-32] Several mechanisms had been proposed for this phenomenon, including Koebnerization, an associated photosensitive disorder, or a direct ultraviolet exacerbation of psoriasis.[32] Rutter and colleagues[32] reported an association of photosensitive psoriasis with low-dose broadband ultraviolet A, the HLA-Cw*0602 allele, and ultraviolet-induced histologic evidence of early psoriasis. Photosensitive psoriasis may not be related to only fair-skinned patients, and dermatologists should be aware of this risk factor when dealing with ethnic skin and advise susceptible patients accordingly.

The most common symptom we recorded was itching, which was reported by 82.4% of our patients. Itching has been shown to be a very common symptom among psoriasis patients, and its incidence ranges from 60% to 90%, depending on the population studied.[33] Egyptian psoriasis patients in this study showed one of the highest incidences of psoriasis-associated pruritus. Patients complaining of pruritus had a higher median PASI score than those without pruritus ($P < .001$), which was comparable to the findings of Bahali and colleagues[34] among Turkish patients with psoriasis. In the current work, itching was most commonly found in patients with plaque psoriasis and least with chronic palmoplantar pustulosis and palmoplantar psoriasis.

Skin pain and tenderness, a commonly neglected and underreported symptom, was reported by 19.4% of our patients irrespective of any joint pain. Tenderness was more commonly reported by female patients ($P = .004$) as well as those with erythrodermic, pustular, or palmoplantar psoriasis ($P = .001, .001,$ and $.009$, respectively). Moreover, patients with dry skin or itching complained of skin tenderness ($P < .001$), a more significant finding. Ljosaa and colleagues[35] reported skin pain in up to 42% of their psoriasis patients, and it was related to quality of life.

Similar to previous reports from different regions of the world,[2,14,16,18] the most common type of psoriasis in our patients was the chronic plaque type, recorded in 84.1% of patients. The less common forms of psoriasis—namely, erythrodermic and pustular psoriasis—were observed in 3.7% and 1.8% of patients, respectively. On comparison of the latter figures with observations from other countries, both erythrodermic and pustular psoriasis were still uncommon compared with other forms of psoriasis; however, differences in incidence were noted among different ethnicities. In Maghreb, erythrodermic and pustular psoriasis was observed in 13.6% and 5.7% of psoriasis patients, respectively,[18] more than double that of our findings. On the other hand, in China, erythrodermic psoriasis was reported in only 0.6% of patients.[16] Access to health care and genetic and epigenetic mechanisms may be responsible for such diversities and may warrant further study.

Table II. Clinical characteristics of the studied patients with psoriasis (n = 2534)

Clinical characteristics	Results
Age at disease onset (mean ± SD), y	30.5 ± 17.1
Disease duration, mo	
Mean ± SD	106.6 ± 60.0
Range	0.25-720
Disease onset	
Gradual	2154 (85.0)
Sudden	380 (15.0)
Disease course	
Progressive	1153 (45.5)
Regressive	56 (2.2)
Remissions and exacerbations	1325 (52.3)
Symptoms*	
Itching	2088 (82.4)
Dryness	926 (36.5)
Skin pain and tenderness	491 (19.4)
None	263 (10.4)
Affected sites*	
Lower limbs	1921 (75.8)
Upper limbs	1774 (70.0)
Scalp	1560 (61.6)
Trunk	1476 (58.2)
Back	1399 (55.2)
Knees	1362 (53.7)
Elbows	1346 (53.1)
Face	549 (21.7)
Nails	524 (20.7)
Palms	489 (19.3)
Flexures	482 (19.0)
Genitalia	444 (17.5)
Neck	430 (17.0)
Soles	429 (16.9)
Phenotype of psoriasis*	
Plaque psoriasis	2132 (84.1)
Guttate	261 (10.3)
Erythrodermic psoriasis	95 (3.7)
Chronic palmoplantar pustulosis	46 (1.8)
Generalized pustular	45 (1.8)

Data are presented as No. (%) unless otherwise indicated.
SD, Standard deviation.
*Patients may present by multiple symptoms, sites, and phenotypes simultaneously.

The most commonly affected sites with psoriasis in the current work were the lower limbs (75.8%) and upper limbs (70%), whereas the least affected were the neck (17%) and soles (16.9%). Scalp involvement was evident in 61.6% of patients, whereas genitalia were affected in 17.5% of patients. Both latter sites may significantly affect patients' quality of life, which seems to be related not only to the body surface area affected but also the site.[36] The relatively high prevalence of scalp involvement among Egyptian patients with psoriasis, and possibly Middle Eastern

Table III. Anthropometric measurements and disease severity among the psoriasis patients (n = 2534)

Variables	Mean ± SD	Median	Minimum	Maximum
BMI	28.0 ± 7.3	27.5	10.6	58.0
The extent of skin lesions (% BSA)	21.3 ± 23.5	10.0	1.0	100.0
PASI (baseline)	8.7 ± 0.09	5.4	0.1	60.4
PDI	13.0 ± 10.0	11.0	0.0	45.0

BMI, Body mass index; *BSA*, body surface area; *PASI*, Psoriasis Area Severity Index; *PDI*, Psoriasis Disability Index; *SD*, standard deviation.

patients—men and women—who share head coverings for cultural or religious reasons, requires further research to determine the effect of head coverings on scalp psoriasis. It also should alert physicians to inquire thoroughly about scalp involvement to avoid missing a diagnosis that has deleterious effects on quality of life.

The mean body mass index was calculated at 28.0 ± 7.3, denoting a tendency for overweight that was comparable to the mean body mass index for the Egyptian population (28.2) reported in 2017[37] Even though most studies have demonstrated that patients with psoriasis have significantly higher odds of having obesity,[38,39] some have shown a lack of evidence to support this notion.[38,40,41] We did not detect any correlation between body mass index and PASI or PDI score. Nonetheless, obesity is assumed to decrease treatment response, complicate drug therapy, increase psoriasis severity,[38] and even present a causal relationship between high body mass index and psoriasis.[42]

The association of cutaneous psoriasis with other diseases has been the focus of several types of research during the past few years. Apart from classic psoriatic arthritis, inflammatory bowel disease, and psychological disorders, evidence suggests that cardiovascular disease, obesity, diabetes, hypertension, dyslipidemia, metabolic syndrome, nonalcoholic fatty liver disease, and cancer have a higher prevalence in psoriasis patients compared with the general population.[43,44] We detected 1 or more of these comorbidities in 38.3% of our patients, with hypertension and diabetes being the most common (11.9% and 10.9% of all patients, respectively). In total, 5.5% of our patients had either active HCV or had received recent treatment for it. The prevalence of HCV among patients with psoriasis has been previously reported to be significantly higher than among nonpsoriatic controls (1.03% vs 0.56%),[45] and this was attributed to hepatitis C—induced upregulation

Table IV. Comparison between male and female psoriasis patients according to demographic and clinical characteristics (n = 2534)

	Sex		
Variables	Women (n = 1107)	Men (n = 1427)	*P* value
Age at disease onset (mean ± SD), y*	28.1 ± 17.1	32.7 ± 16.9	<.001
Positive family history of psoriasis	191 (17.3)	252 (17.7)	.79
Smoking	38 (3.4)	648 (45.4)	<.001
Symptoms			
Itching	933 (84.3)	1155 (8.9)	.03
Dryness	415 (37.5)	511 (35.8)	.38
Skin pain and tenderness	243 (22.0)	248 (17.4)	.004
None	99 (8.9)	164 (11.5)	.04
Phenotype of psoriasis[†]			
Plaque	895 (80.8)	1237 (86.7)	<.001
Guttate	126 (11.4)	135 (9.5)	.11
Erythrodermic	30 (2.7)	65 (4.6)	.02
Chronic palmoplantar pustulosis	15 (1.4)	31 (2.2)	.13
Generalized pustular	26 (2.3)	19 (1.3)	.05
Precipitating factors*			
Stress	466 (42.1)	555 (38.9)	.10
Cold	455 (41.1)	551 (38.6)	.20
None	268 (24.2)	402 (28.2)	.03
Sun	157 (14.2)	243 (17.0)	.05
Infection	52 (4.7)	64 (4.5)	.81
Drugs	32 (2.9)	33 (2.3)	.36
Trauma	1 (0.1)	4 (0.3)	.29
Food	2 (0.2)	2 (0.1)	>.99

Data are presented as No. (%) unless otherwise indicated. $P \leq .05$ was considered statistically significant. The analysis was conducted by χ^2 test.
SD, Standard deviation.
*Analysis conducted by independent *t* test.
[†]Patients may present by multiple phenotypes simultaneously.

Table V. Comparison between male and female psoriasis patients according to anthropometric and clinical characteristics (n = 2534)

	Women			Men			
Variables	Median	Minimum	Maximum	Median	Minimum	Maximum	*P* value
Age at presentation, y	36	1	76	43	2	94	<.001
Duration, mo	60	0.25	708	72	0.25	720	.005
BMI	29.7	10.6	58	26	11.11	51.78	<.001
Extent of skin lesions (% BSA)	10	0	97	15	0	100	<.001
PASI (baseline)	4.4	0.1	57.4	6.5	0.1	60.4	<.001
PDI	10	0	45	11	0	45	.005

$P \leq .05$ was considered statistically significant. The analysis was conducted with a Mann-Whitney *U* test.
BMI, Body mass index; *BSA*, body surface area; *PASI*, Psoriasis Area Severity Index; *PDI*, Psoriasis Disability Index.

of key psoriasis cytokines; namely, cathelicidin, TLR9, and interferon gamma.[46]

The mean PASI score in our registry records was low (8.7 ± 0.09), probably because most patients were receiving treatment for psoriasis at registry enrollment. A similar explanation was suggested by Kimbal and colleagues[47] to justify their findings of body surface area in the PSOLAR registry. On the other hand, a relatively high mean PDI score and mean percentage body surface area in our registry (13.0% ± 10.0% and 21.0% ± 24.0%, respectively), contrasting with the relatively low PASI score, reflects the importance of using several parameters for proper evaluation of disease severity. We observed significantly lower values for PASI score, PDI score, and percentage body surface area affected among

female patients compared with male patients. This may be related to female patients' younger age and shorter disease duration at first visit, with consequently an earlier therapeutic intervention in comparison with that for male patients.

To summarize, in response to the global interest for the sociodemographic specificities of psoriasis, this registry-based study is the largest descriptive analysis of Egyptian patients with psoriasis, to our knowledge. It shows that the characteristics of Egyptian patients with psoriasis are comparable to those of other studied ethnic groups, apart from minor differences. Paradoxically, sun exposure without sunburn is an exacerbating factor in 15.8% of Egyptian psoriasis patients. The positive family history of psoriasis among Egyptian patients is one of the lowest worldwide. Pruritus was the commonest symptom associated with psoriasis in more than 80% of our cases, is associated with higher PASI score, and should be further investigated as predictive of psoriasis severity. Further descriptive studies using the Kasr Al-Ainy Psoriasis Unit Disease Registry may help assess patterns of management and outcomes of this cohort of patients.

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Supplemental Table I. Baseline Psoriasis Area Severity Index score in relation to various parameters

PASI (baseline)	r	P value
Age, y	0.143	<.001
Duration, mo	0.095	<.001
BMI	−0.024	.26
Extent (% BSA)	0.79	<.001
PDI	0.421	<.001

BMI, Body mass index; *BSA*, body surface area; *PASI*, Psoriasis Area Severity Index; *PDI*, Psoriasis Disability Index.

Supplemental Table II. Smoking in relation to psoriasis phenotypes and symptoms

Psoriasis phenotype and symptoms	Smoking		P value
	No	Yes	
Itching	1529 (82.7)	559 (81.5)	.46
Dryness	681 (36.9)	245 (35.7)	.60
Tenderness	374 (20.2)	117 (17.1)	.07
None	184 (10.0)	79 (11.5)	.25
Plaque psoriasis	1527 (82.6)	605 (88.2)	.001
Scalp psoriasis	760 (41.1)	311 (45.3)	.06
Nail psoriasis	238 (12.9)	154 (22.4)	<.001
Flexural	216 (11.7)	91 (13.3)	.28
Guttate	199 (10.8)	62 (9.0)	.203
Palmoplantar psoriasis	159 (8.6)	78 (11.4)	.03
Erythrodermic psoriasis	58 (3.1)	37 (5.4)	.008
Chronic palmoplantar pustulosis	31 (1.7)	15 (2.2)	.39
Pustular	38 (2.1)	7 (1.0)	.08

Supplemental Table III. Skin tenderness in relation to itching, dryness, and psoriasis phenotypes

Psoriasis variables	Tenderness		P value
	No (n = 2043)	Yes (n = 491)	
Itching	1652 (80.9)	436 (88.8)	<.001
Dryness	663 (32.5)	263 (53.6)	<.001
None	263 (12.9)	0	<.001
Plaque psoriasis	1744 (85.4)	388 (79.0)	.001
Scalp psoriasis	870 (42.6)	201 (40.9)	.51
Nail psoriasis	304 (14.9)	88 (17.9)	.09
Flexural	237 (11.6)	70 (14.3)	.11
Guttate	215 (10.5)	46 (9.4)	.45
Palmoplantar psoriasis	176 (8.6)	61 (12.4)	.009
Erythrodermic psoriasis	64 (3.1)	31 (6.3)	.001
Chronic palmoplantar pustulosis	34 (1.7)	12 (2.4)	.25
Pustular	26 (1.3)	19 (3.9)	<.001