Dermatology Practical & Conceptual

Palmoplantar Psoriasis: Epidemiological and Clinical Features and Impact on Quality of Life

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ABSTRACT

Introduction: Palmoplantar psoriasis is a rare variant of psoriasis. Its impact on quality of life has been poorly investigated.

Objectives: Our aim was to investigate the prevalence of localized palmoplantar psoriasis (PPP), to assess its severity using the modified Palmoplantar Pustular Psoriasis Area and Severity Index (m-PPPASI), and to evaluate the correlation with the Dermatology Life Quality Index (DLQI).

Methods: We conducted a descriptive study with prospective data collection from January to June 2021. We enrolled 223 patients with psoriasis. We excluded patients without palmar/plantar involvement and those with a body surface area (BSA) greater than or equal to 10%.

Results: We included 33 patients with PPP. This corresponded to a 14.8% prevalence among all psoriasis phenotypes. The mean age was 45 years. The male-to-female ratio was 2.3. Pruritus was present in 27 cases. The mean m-PPPASI was 11.77. The mean DLQI was 8.33. A significant correlation was found between DLQI and m-PPPASI: mean DLQI scores for patients with m-PPPASI less than or equal to 10 and m-PPPASI greater than 10 were 5.6 and 11.3, respectively ($P = 0.002$). Only 11.8% of patients with m-PPPASI less than or equal to 10 had a DLQI greater than 10, whereas 50% of those with m-PPPASI greater than 10 had a DLQI greater than 10 ($P = 0.026$).

Conclusions: Based on the present work, we confirm that, although affecting a reduced BSA, PPP is a severe form of psoriasis. We consider the m-PPPASI to be a reliable tool which can be used to assess the severity of PPP.

Introduction

Psoriasis is a common chronic inflammatory dermatosis that affects 2–4% of the world population [1]. It is characterized by a major impact on quality of life (QoL). Some phenotypes, such as inverted psoriasis, nail psoriasis, palmoplantar psoriasis, and scalp psoriasis, can have a marked negative impact on patients' QoL, despite the relatively small body surface area (BSA) affected. In these forms, patients generally experience disproportionate emotional discomfort. This is due not only to the functional but also to the aesthetic prejudice caused by the damage of exposed areas [2].

Palmoplantar psoriasis is a rare variant of psoriasis that develops on the palms and soles. It may or may not be associated with other localizations of psoriasis. It is characterized by considerable severity and resistance to standard treatments [3-5]. Its severity is underestimated by the Psoriasis Area and Severity Index (PASI). Although the impact of plaque psoriasis on QoL has been widely studied, QoL of patients with palmoplantar psoriasis has scarcely been assessed [6–10].

Objectives

The aims of this study were to investigate the prevalence and the epidemiological and clinical features of localized palmoplantar psoriasis (PPP) in our population, to assess its severity using the modified Palmoplantar Pustular Psoriasis Area and Severity Index (m-PPPASI), and to evaluate the correlation with the Dermatology Life Quality Index (DLQI).

Methods

This was a descriptive study with prospective data collection over six months (January to June 2021). We enrolled 223 patients with psoriasis from all age groups. We excluded patients with no palmar and plantar involvement and those with a BSA ≥10%. The diagnosis was made by two dermatologists (DE and FR) based on clinical criteria. A mycological staining was requested in atypical, unilateral, or asymmetric forms. Histological examination of a skin biopsy of the palm or the sole using a four mm punch was performed in uncertain cases. Patients with non-concordant histology or with a positive mycological specimen were excluded. The m-PPPASI and DLQI were calculated for all included patients. PPP was considered severe if the m-PPPASI was >10 or if a systemic treatment and/or a phototherapy were required. PPP was considered to impair patients' QoL if the DLQI was >10 or in the case of repercussions on education or work. We divided our patients into two groups: those with a m-PPPASI ≤10 and those with a m-PPPASI >10, and we compared their DLQI scores.

Other epidemio-clinical factors associated with impaired DLQI were also evaluated. Clinical data were collected on a standardized form. All data were electronically compiled and analysed using IBM SPSS version 21. We calculated the absolute and relative values for qualitative variables and means and standard deviations and ranges (minimum and maximum) for quantitative variables. We assessed QoL impairment according to patients' demographic and clinical features and disease severity. Comparisons of two means between two independent samples were made using the Student t-test. Comparisons of percentages between independent series were made using Pearson Chi-square test. If this test was invalid, comparisons were made using Fisher two-tailed exact test. In all statistical tests, the level of significance was defined as 5%.

The forms were completed with the informed consent of the patients or their legal guardians. Measures were taken to ensure the protection of patients' personal data. Names have been replaced by numbers, and iconography has been made unrecognizable. The study was approved by the Ethics Committee of the Hospital: Decision number 85/2020/CLPP.

Results

We included 33 patients with PPP. This corresponded to a prevalence of PPP among all psoriasis phenotypes of 14.8% (Figure 1). The mean age at time of inclusion was 45 ± 18 years, with extremes between 9 and 69 years. Three children were included. The mean age at onset was 37.19 ± 17 years. The male-to-female ratio was 2.3. Fifteen patients were soldiers (45%). A family history of psoriasis was present in eight patients (24%). Personal history was dominated by smoking, dyslipidemia, hypertension, obesity, depression or anxiety, psoriatic arthritis, diabetes, and hypothyroidism, present in 36%, 30%, 27%, 21%, 18%, 18%, 15%, and 9% of patients included, respectively. We did not observe any personal history or comorbidities in the three children included.

Pruritus was the most frequent functional sign, with a point prevalence (during the previous seven days) at 82%. Pain and heat or burning were present in 24% and 12% of cases, respectively. None of the patients was asymptomatic. The positive diagnosis was based on clinical examination in 28 patients (85%): thick hyperkeratotic plaques overlying a bright red, well-defined erythematous background with or without fissures (Figure 2, A and B). A mycological swab was carried out in an atypical form with slightly thickened scales and was negative (3%). Four patients in whom the diagnosis was uncertain underwent pathological examination (12%). The most frequently associated psoriatic lesions were nail psoriasis (12 cases) and plaque psoriasis on the back of the hands (eight cases) (Figure 3, A and B).

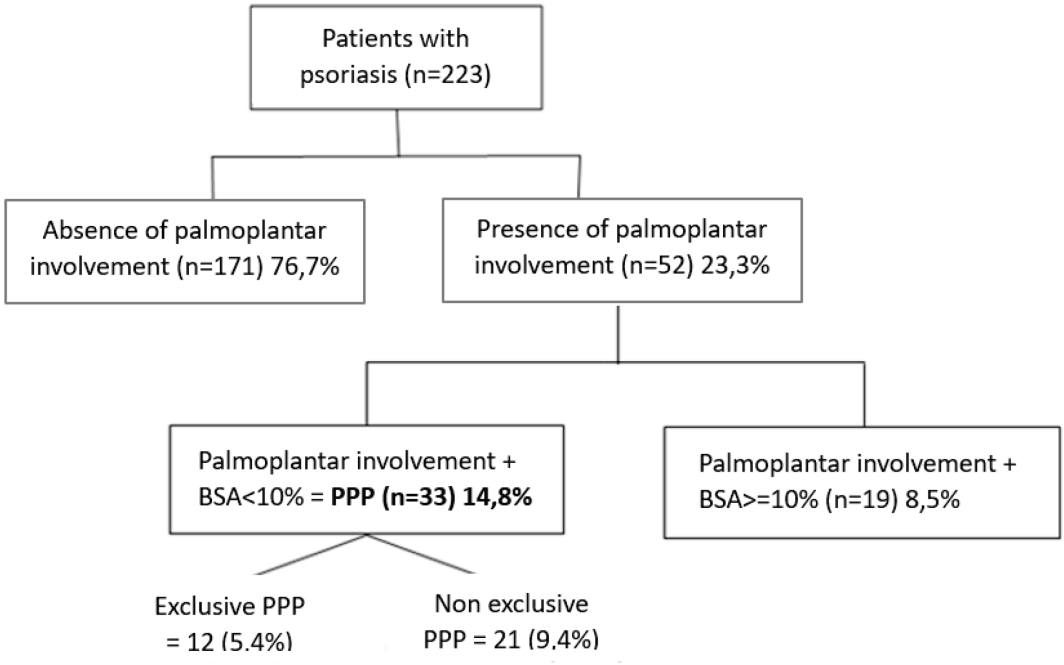

Figure 1. Prevalence of palmoplantar involvement in psoriasis.

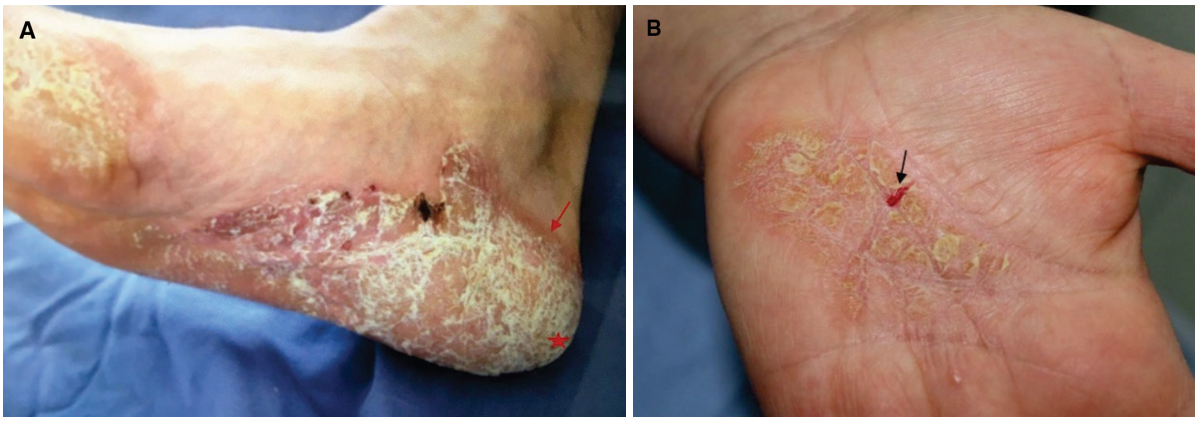

Figure 2. (A) Plantar keratoderma featuring thick white scales (star) on a sharply defined bright erythematous background that extends beyond the scaly patches (arrow). (B) Palmar keratoderma made of thick scaly plaques on an erythematous background with fissures (arrow).

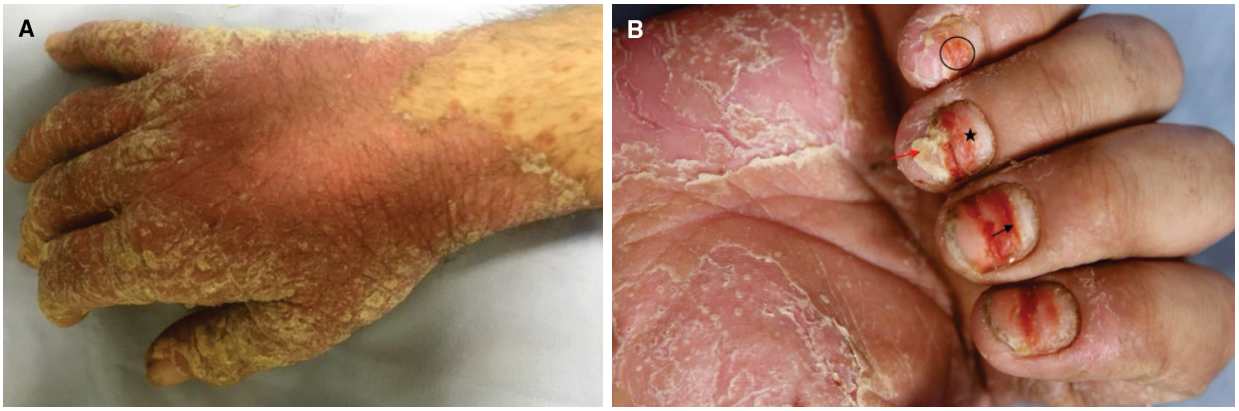

Figure 3. (A) Palmoplantar psoriasis (PPP) with involvement of the back of the hands. (B) Nail involvement in a PPP patient: onycholysis (red arrow), pachyonychia (star), trachyonychia (circle), and Beau's line (black arrow).

Table 1. Correlation between Impairment of Quality of Life (QoL) and Epidemiological and Clinical Parameters.

	Epidemiological Factors					
	Age (Years)			Sex		
	<14 (n=3)	>=14 (n=30)	P	M (n=23)	F (n=10)	P
Mean DLQI	8.67 ± 3	8.3 ± 5	NS	8.04 ± 5	9 ± 5	NS
DLQI > 10 n (%)	1 (33%)	9 (30%)	1	7 (30%)	3 (30%)	1

	Clinical Factors											
	Clinical subtypes			Duration of the disease (Years)			Pruritus			Nail psoriasis		
	Plaques (n=31)	Pustular (n=2)	P	<=5 (n=21)	>5 (n=12)	P	Yes (n=29)	No (n=4)	P	Yes (n=12)	No (n=21)	P
Mean DLQI	8.22 ± 5	10 ± 11	NS	8.16 ± 5	8.42 ± 6	NS	8.48 ± 5	7.25 ± 3	<0.001	9.58 ± 4	7.62 ± 4	<0.001
DLQI > 10 n (%)	9 (29%)	1 (50%)	NS	6 (29%)	5 (42%)	<0.001	12 (41%)	1 (25%)	<0.001	5 (42%)	5 (24%)	<0.001

	Severity: M-PPPASI		
	<=10 (n=17)	>10 (n=16)	P
Mean DLQI	5.6 ± 3	11.3 ± 5	**0.002**
DLQI > 10 n (%)	2 (11.8%)	8 (50%)	**0.026**

P: Level of significance. *P* values are statistically significant at a threshold of 5%

Twenty-three patients had severe PPP (70%). Eighteen patients had received or were receiving systemic treatment and/or phototherapy for PPP (55%): phototherapy (seven cases), oral treatment (five cases), and both phototherapy and oral treatment (six cases). The remaining patients (45%) were managed by topical treatment based on betamethasone 0.05% cream. Twenty patients had received at least one treatment before being included in the study. Sixteen patients (48%) had an m-PPPASI >10. The mean m-PPPASI was 11.77 [2.4–43.2].

Overall, 14 patients' QoL was impacted by PPP (42%). Eleven patients had their education or work life negatively impacted by PPP: absenteeism (seven cases), exemption from wearing military footwear in active soldiers (five cases), and difficulty holding a pen or writing in two of the included children. Ten patients (30%) had a DLQI >10. The mean DLQI was 8.33 [0–20].

A statistically significant correlation was found between the DLQI and the m-PPPASI in our patients: The mean DLQI in patients with an m-PPPASI ≤10 and an m-PPPASI >10 were 5.6 ± 3 and 11.3 ± 5, respectively (P = 0.002). Only two patients with an m-PPPASI ≤10 had a DLQI >10 (11.8%), whereas eight patients with an m-PPPASI >10 had a DLQI >10 (50%) (P = 0.026). The other factors that significantly impaired the DLQI score were disease duration exceeding five years, the presence of pruritus, and nail psoriasis. However, no significant correlation was found between the DLQI score and age group, sex, or clinical subtype. The correlation between impairment of QoL and epidemiological and clinical parameters is shown in Table 1.

Discussion

The prevalence of PPP in patients with psoriasis varies widely in the literature, from 2.8% to 40.9% [11–13]. This may be explained by the use of different inclusion criteria. For example, Ammar et al. [13], as in our series, calculated the prevalence of PPP with BSA to be less than 10% (9% vs. 14.8% in our study), while Pettey et al. [12] estimated the prevalence of patients with palmoplantar involvement, regardless of the extent of psoriasis on the rest of the tegument, at 39% (23.3% in our study). In the literature, family history of PPP has been observed to range from 3% [14] to 38.6% [4] in patients with PPP. In our study, this prevalence was 24%. Pruritus was observed in 82% of our patients. In this context, pruritus has been identified as a major functional sign of psoriasis, with a prevalence exceeding 90% in some series [15]. The prevalence of pruritus in different subtypes of psoriasis varies in the literature. Jaworecka et al. [15] did not find any significant difference between the different

subtypes. Conversely, Sampogna et al. [16] found that PPP is the form of psoriasis that is most associated with pruritus, and Damiani et al. [17] found that pustular psoriasis is the form of psoriasis that is most associated with pruritus. Other functional signs, such as pain and hot or burning sensation, were less frequently observed in our patients than in other series of patients with PPP [16]. Several other symptoms, such as bleeding and discomfort upon contact with water, have been reported in the literature [16].

According to the previously defined criteria, 70% of our patients had severe psoriasis. Indeed, PPP is now increasingly recognized as a criterion for the severity of the psoriatic disease. In 2009, the Psoriasis Group of the Spanish Academy of Dermatology and Venereology considered palmoplantar involvement to be an independent indicator of severity, in itself justifying the use of biological therapies [18]. More than half of our patients (55%) required systemic treatment and/or phototherapy. This can be explained by the thickness of the stratum corneum in the palms and soles, which acts as a barrier to the penetration of topical treatments, but also by the severity and degree of disability caused by this form of psoriasis. In this context, in 2020, the Delphi Consensus of the International Psoriasis Council divided psoriatic patients into two categories of severity: patients who were candidates for topical treatments and patients who were candidates for systemic treatments, and considered that the involvement of particular areas, including palmoplantar area, directly classified psoriasis as belonging to the second category, regardless of BSA [19]. Despite a reduced BSA, PPP is now recognized as a severe form of psoriasis. Thus, evaluating PPP severity based on BSA and PASI is problematic and even inconvenient [18]. The m-PPPASI is a specific score initially described to assess the severity of palmoplantar pustular psoriasis and then modified to evaluate all forms of PPP [20]. Afterwards, this score was used by several authors in therapeutic trials to compare the efficacy of treatments in patients with PPP [11,20,21]. It is therefore validated for assessing the severity of PPP [22]. Our study confirms that this score is convenient for assessing the severity of PPP as it significantly correlates with the well-recognized DLQI.

We considered that the DLQI enables us to assess the impairment of the QoL of our patients; this score has been used to assess the QoL of patients with palmoplantar dermatoses, including PPP [4], and in therapeutic trials in PPP [23]. As reported in the literature, we confirm that PPP is one of the psoriasis phenotypes most associated with pruritus [15]. Moreover, fissures are often present, causing pain and bleeding and preventing simple daily life activities, such as carrying a shopping bag or gardening. In addition, patients feel stigmatized and are sometimes rejected by people who do not know that the condition is not contagious. Also, the nature of the footwear of these patients is very much influenced by the disease. Furthermore, the application of topical treatments on the palms can restrict patients' activities since it causes more soiling than when applied on other affected areas. All these aspects are evaluated by the DLQI, and all these impacts are essentially related to the palmoplantar location of psoriasis. However, this tool was not specifically designed for the palmoplantar location. In the course of a retrospective study, Farley et al. [3] proposed a specific QoL score for PPP: the palmar-plantar Quality-of-life Index. This score seems simple and has the advantage of being specific to palmoplantar conditions but has not yet been verified in prospective studies.

In our study, we report a slightly lower mean DLQI than that reported by other authors [4,23,24]. In fact, we included patients irrespective of the severity of their disease. However, in Bissonnette's study, for example, only patients who were candidates for biotherapy were included [23]. Several authors have identified a significant association between the DLQI and the PASI in plaque psoriasis [25]. However, despite the significant impact of PPP, no studies have investigated the correlation between the DLQI and the m-PPPASI scores to date. Recent studies have analyzed this association in patients with palmoplantar pustulosis and found statistically significant correlations [26]. These observations are consistent with the results observed in our patients, in whom the QoL impairment was proportional to the severity as assessed by the m-PPPASI score ($P = 0.005$). The m-PPPASI is, therefore, an objective and reliable tool which enables clinicians to assess the severity of the disease in order to guide appropriate therapy by weighing up the risk-benefit balance for high m-PPPASI patients, who are profoundly affected by their disease. Furthermore, although not specific, and in the absence of specific validated tools, the DLQI can reasonably be considered an objective and useful tool to assess the QoL in patients with PPP.

Limitations

The main weaknesses are the monocentric nature of the research, the short duration of data collection, the inclusion of patients who had already received treatment, which may influence the severity scores, and the fact that approximately half of the patients belonged to the military, which may not be representative of the general population.

Conclusions

We present research investigating the correlation between the m-PPPASI and DLQI scores in PPP. The other highlights of our study are its prospective nature and its epidemiological and clinical approach, which analyzes the correlations between some epidemio-clinical parameters and the impairment of QoL.

There is no doubt that in order to fully appreciate the true impact of PPP on patients, we need to assess their QoL. Better quality and specific assessment tools are needed to further reduce the gap between what is experienced by patients and what is perceived by clinicians. We can hope that understanding this impact will lead to better, safer, more effective treatments.

References

1. Parisi, R. et al. National, regional, and worldwide epidemiology of psoriasis: systematic analysis and modelling study. *BMJ* 369, m1590 (2020). doi: 10.1136/bmj.m1590.
2. Merola, J. F., Qureshi, A. & Husni, M. E. Nuances of treating psoriasis affecting the scalp, face, intertriginous areas, genitals, hands, feet, and nails. *Dermatol. Ther.* 31, (2018). doi: 10.1111/dth.12589.
3. Farley, E., Masrour, S., McKey, J. & Menter, A. Palmoplantar psoriasis: A phenotypical and clinical review with introduction of a new quality-of-life assessment tool. *J. Am. Acad. Dermatol.* 60, 1024–1031 (2009). doi: 10.1016/j.jaad.2008.11.910.
4. Chung, J. *et al.* Palmoplantar psoriasis is associated with greater impairment of health-related quality of life compared with moderate to severe plaque psoriasis. *J. Am. Acad. Dermatol.* 71, 623–632 (2014). doi: 10.1016/j.jaad.2014.04.063.
5. Spuls, P., Hadi, S., Rivera, L. & Lebwohl, M. Retrospective analysis of the treatment of psoriasis of the palms and soles. *J. Dermatol. Treat.* 14, 21–25 (2003). doi: 10.1080/jdt.14.s2.21.25.
6. Gupta, M. A., Schork, N. J., Gupta, A. K., Kirkby, S. & Ellis, C. N. Suicidal ideation in psoriasis. *Int. J. Dermatol.* 32, 188–190 (1993). doi: 10.1111/j.1365-4362.1993.tb02790.x.
7. Basavaraj, K. H., Navya, M. A. & Rashmi, R. Stress and quality of life in psoriasis: an update: Stress and psoriasis. *Int. J. Dermatol.* 50, 783–792 (2011). doi: 10.1111/j.1365-4632.2010.04844.x.
8. Martínez-Ortega, J. M. *et al.* Quality of life, anxiety and depressive symptoms in patients with psoriasis: A case-control study. *J. Psychosom. Res.* 124, 109780 (2019). doi: 10.1016/j.jpsychores.2019.109780.
9. Kok, Y., Braue, A., Martyres, R. & Varigos, G. Assessing quality of life and depression in psoriasis patients: A cross□sectional study. *Australas. J. Dermatol.* 61, (2020). doi: 10.1111/ajd.13116.
10. Pompili, M. *et al.* Suicide risk and psychiatric comorbidity in patients with psoriasis. *J. Int. Med. Res.* 44, 61–66 (2016). doi: 10.1177/0300060515593253.
11. Janagond, A. B., Kanwar, A. J. & Handa, S. Efficacy and safety of systemic methotrexate vs. acitretin in psoriasis patients with significant palmoplantar involvement: a prospective, randomized study: Methotrexate vs. acitretin in palmoplantar psoriasis. *J. Eur. Acad. Dermatol. Venereol.* 27, e384–e389 (2013). doi: 10.1111/jdv.12004.
12. Pettey, Adam. A., Balkrishnan, R., Rapp, S. R., Fleischer, A. B. & Feldman, S. R. Patients with palmoplantar psoriasis have more physical disability and discomfort than patients with other forms of psoriasis: implications for clinical practice. *J. Am. Acad. Dermatol.* 49, 271–275 (2003). doi: 10.1067/s0190-9622(03)01479-8.
13. Ammar, M. *et al. CARD14* alterations in Tunisian patients with psoriasis and further characterization in European cohorts. *Br. J. Dermatol.* 174, 330–337 (2016). doi: 10.1111/bjd.14158.
14. Khandpur, S., Singhal, V. & Sharma, V. K. Palmoplantar involvement in psoriasis: a clinical study. *Indian J. Dermatol. Venereol. Leprol.* 77, 625 (2011). doi: 10.4103/0378-6323.84071.
15. Jaworecka, K. *et al.* Characteristics of Pruritus in Various Clinical Variants of Psoriasis: Results of the Multinational, Multicenter, Cross-Sectional Study. *Life* 11, 623 (2021). doi: 10.3390/life11070623.
16. Sampogna, F. *et al.* Prevalence of symptoms experienced by patients with different clinical types of psoriasis. *Br. J. Dermatol.* 151, 594–599 (2004). doi: 10.1111/j.1365-2133.2004.06093.x.
17. Damiani, G. *et al.* Pruritus characteristics in a large Italian cohort of psoriatic patients. *J. Eur. Acad. Dermatol. Venereol.* 33, 1316–1324 (2019). doi: 10.1111/jdv.15539.
18. Puig, L. *et al.* Documento de consenso sobre la evaluación y el tratamiento de la psoriasis moderada/grave del Grupo Español de Psoriasis**El Grupo Español de Psoriasis es un grupo de trabajo de la Academia Española de Dermatología y Venereología, formado por 50 dermatólogos de ámbito hospitalario, con especial dedicación al tratamiento de pacientes con psoriasis, que cooperan en la investigación clínica y terapéutica en el ámbito de esta enfermedad. de la Academia Española de Dermatología y Venereología. *Actas Dermo-Sifiliográficas* 100, 277–286 (2009). PMID: 19463230.
19. Strober, B. *et al.* Recategorization of psoriasis severity: Delphi consensus from the International Psoriasis Council. *J. Am. Acad. Dermatol.* 82, 117–122 (2020). doi: 10.1016/j.jaad.2019.08.026.
20. Brunasso, A., Salvini, C. & Massone, C. Efalizumab for severe palmo-plantar psoriasis: an open-label pilot trial in five patients. *J. Eur. Acad. Dermatol. Venereol.* 23, 415–419 (2009). doi: 10.1111/j.1468-3083.2008.03062.x.
21. Ara, S., Mowla, M. R., Alam, M. & Khan, I. Efficacy of oral methotrexate (MTX) monotherapy vs oral MTX plus narrowband ultraviolet light B phototherapy in palmoplantar psoriasis. *Dermatol. Ther.* 33, e13486 (2020). doi: 10.1111/dth.13486.
22. Miceli, A. & Schmieder, G. J. Palmoplantar Psoriasis. in *StatPearls* (StatPearls Publishing, Treasure Island (FL), 2021). Bookshelf ID: NBK448142.
23. Bissonnette, R. *et al.* Treatment of palmoplantar psoriasis with infliximab: a randomized, double-blind placebo-controlled study: Treatment of palmoplantar psoriasis with infliximab. *J. Eur. Acad. Dermatol. Venereol.* 25, 1402–1408 (2011). doi: 10.1111/j.1468-3083.2011.03984.x.
24. Callis Duffin, K. *et al.* Characterization of Patients with Psoriasis in Challenging-to-Treat Body Areas in the Corrona Psoriasis Registry. *Dermatology* 237, 46–55 (2021). doi: 10.1159/000504841.
25. Yavuz Daglioglu, E. B., Cadirci, D. & Aksoy, M. Effects of disease severity on quality of life in patients with psoriasis. *Dermatol. Ther.* 33, (2020). DOI: 10.1111/dth.14422.
26. Sarıkaya Solak, S. *et al.* Clinical characteristics, quality of life and risk factors for severity in palmoplantar pustulosis: a cross□sectional, multicentre study of 263 patients. *Clin. Exp. Dermatol.* ced.14829 (2021) doi:10.1111/ced.14829.