Understanding the enigmatic association between mycosis fungoides and psoriasis: Report of two cases and review of the literature

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\textbf{A R T I C L E   I N F O}

\textbf{Keywords:}
Anti-TNF
Biologics
Cutaneous lymphoma
Immunosuppressive
Lymphoma
Mycosis fungoides
Psoriasis

\textbf{A B S T R A C T}

Psoriatic patients present an increased risk for developing lymphoma, particularly cutaneous T-cell lymphoma (CTCL). To what degree psoriasis itself through chronic immune stimulation, or the immunosuppressive medications used for its treatment or comorbidities (obesity, diabetes mellitus, etc), or lifestyle (smoking, alcohol, diet, etc) may play a role in the onset of MF is not yet clear. Psoriasis and Mycosis Fungoides (MF), the most common variant of CTCL, represent two distinct entities sharing common pathogenetic mechanisms and a wide spectrum of common clinical features associated with the abnormal activation of T-cells. The aim of this study is to explore the relationship between MF and psoriasis by presenting two cases with clinical and histopathologic features of both psoriasis and MF with a particular emphasis on the time of presentation of both disorders, the use of previous immunosuppressive drugs as well as the therapeutic management of patients. Biopsy of the cutaneous lesions before the introduction of biologics should be incorporated in clinical practice. Biopsy of the cutaneous lesion should also be performed in the case of appearance of psoriasisform lesions during biologic treatment for autoimmune disorders because this may represent an indolent form of MF. Psoriatic patients with poor or no response to treatment should be examined thoroughly for MF using immunochemistry and, if necessary, molecular biology techniques. In concomitant MF and psoriasis, combination treatment may be beneficial for both entities. Finally, a large multicentric registry of MF patients who were treated for benign dermatoses (i.e. eczema, psoriasis) with classic immunosuppressive drugs and/or biologics is needed to collect data and further clarify the enigmatic relationship between psoriasis, MF and immunosuppressive treatment.

1. Introduction

Early stage mycosis fungoides (MF), the most common type of Cutaneous T-Cell Lymphoma (CTCL), can mimic frequent and benign dermatoses such as eczema or psoriasis, delaying the diagnosis by several years \cite{1}. MF has been characterized as a “dermatological masquerader” due to its multiple clinical variants, such as folliculotropic, poikilodermatous, hypopigmented, capillaritis-like, verrucous/hyperkeratotic, psoriasiform, ichthyosiform and bullous. In its erythrodermic form, the differential diagnosis between eczema or psoriasis and MF is virtually impossible based on clinical appearance \cite{1,2}.

Psoriasis is one of the commonest chronic dermatoses, with approximately 2–3\% of subjects affected worldwide, presenting with erythematous scaly plaques that can be clinically indistinguishable from psoriasiform MF \cite{2–12}. Psoriasis, a chronic immune-mediated inflammatory disorder, has been linked to a moderately higher risk of certain malignancies, particularly keratinocyte, lung, urinary/bladder, oropharynx/larynx, hepatic and colorectal cancers as well as lymphomas \cite{2,13,14}.

During the last century, the occurrence of lymphoma in autoimmune disorders including psoriasis has been extensively investigated. More specifically, in rheumatoid arthritis (RA), the overall incidence of lymphoma is approximately twice than that in the general population \cite{15–21}. A very recent collaborative analysis of 12 European registries

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https://doi.org/10.1016/j.metop.2021.100148
Received 31 October 2021; Accepted 2 November 2021
Available online 4 November 2021
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has shown that although the subtype of lymphoma distribution differed between RA and the general population, there were no differences in the distribution of lymphoma subtypes in patients with RA treated with Tumor Necrosis factor-alpha (TNF-\(\alpha\)) inhibitors compared with bio-naïve patients [22]. The association between psoriasis and lymphoma has also been discussed [2,14,23,24]. Two large population-based studies have shown that the incidence rates for Hodgkin lymphoma, non-Hodgkin lymphoma and CTCL were higher among patients with psoriasis compared with the general population [23,24]. A recent meta-analysis has shown that, compared to controls, patients with moderate-to-severe psoriasis presented a slightly elevated risk for developing lymphohematopoietic cancer (LHC), ranging from 1.7-fold for Hodgkin lymphoma, 1.3-fold for Non-Hodgkin lymphoma (NHL), multiple myeloma and leukemia to 6-fold for CTCL/MF [14].

On the other hand, based on case series and case reports [25,26], there have been cases of MF misdiagnosed as psoriasis. In these cases, it is very difficult to clarify: 1) whether patients also presented psoriasis that evolved to MF, and 2) what could be the potential link between MF and the use of immunosuppressive drugs such as TNF-inhibitors in psoriasis. However, it is worth noting that: 1) diagnosis of psoriasis is not supported by pathology most of the time and 2) histologic findings of lesions in early MF may be misinterpreted as psoriasis. Another intriguing point is the chronic sequence of the MF and psoriasis coexistence, and its connection with the use of biologics such as TNF-inhibitors in psoriasis. More specifically, regarding the time of MF appearance, it seems that MF appears frequently later in the course of an autoimmune or inflammatory disorder such as psoriasis and after the use of immunosuppressive drugs or biologics [25–28]. However, in a cohort of 177 patients with MF, MF preceded psoriasis diagnosis in 58.1% of cases, while 25.6% of psoriasis diagnoses were supported by pathology suggesting that the purported association between those two disorders is less likely due to misclassification bias [27].

The aim of this study is to explore the relationship of MF and psoriasis by presenting two cases with clinical and histopathologic features of both psoriasis and MF with a particular emphasis on the time of presentation of both disorders, the use of previous drugs as well as the therapeutic management of patients.

2. Case reports

2.1. First case

A 65-year-old Caucasian male patient with a history of refractory psoriasis to many previous systemic treatments, including several biologies had been hospitalized in our Dermatology Department, being erythrodermic upon admission (Body Surface Area/BSA: 100%) with a longstanding exfoliative dermatitis (Fig. 1A and B). At the age of 43, he presented with xeroderma of the shins and 7 years later with moderate generalized xerosis of his body without erythema. The skin biopsy revealed ichthyosis. After 4 years, he reported a progressive loss of scalp hair leading to alopecia totalis, and 8 years later a rapidly spreading macular erythroderma with scattered thicker plaques and intense pruritus. Histology of the latter revealed psoriasis. Since then, the patient has undergone a series of unsuccessful treatments depicted in Table 1.

A new skin biopsy during his hospitalization in our clinic was diagnostic of folliculotropic MF (Fig. 1C). CT scans of neck, chest, upper and lower limbs showed no evidence of lymphadenopathy.

Fig. 1. A & B. The patient presented with longstanding exfoliative dermatitis. No nail psoriasis or psoriatic arthritis were observed. C. H&E x40. Clear epidermotropism of atypical lymphocytes and one Pautrier’s microabscess are observed. D. Psoriasiform appearance of the patient’s lesions, one month after initiation of interferon-alpha-2b. E. H&E x40. Biopsy of a lesion of the shoulder revealed both epidermotropism of atypical lymphocytes, as well as Munro’s microabscesses, acanthosis, hyper- and parakeratosis and effacement of the granular layer, elements of both MF and psoriasis within the same lesion. F. Pustular eruption on the patient’s scalp after 1.5 month of treatment with interferon-alpha-2b. G. Pustular lesion of the scalp revealed regular acanthosis, effacement of the granular layer, intense neutrophilic infiltrate and presence of Munro’s microabscesses. No features of MF were observed.
lower abdomen were negative for enlarged lymph nodes and visceral involvement. The stage of MF was T4N0M0B0 (IIIA). Treatment for MF was initiated (Table 1). After 1 month of treatment with interferon monotherapy, lesions gave the clinical impression of psoriasis and histology from his posterior trunk and his right shoulder confirmed a limited infiltration by atypical cells diagnostic of MF, but the specimen from the shoulder demonstrated elements of both MF and psoriasis (Fig. 1D and E).

Low dose methotrexate (10 mg q.w per os) was added to interferon. Two weeks later, the patient initially showed slight improvement of his erythroderma (from 85% BSA to 75% BSA), but in a follow-up visit, he presented with pustular psoriasis of the scalp. New skin biopsies, one from the back and one from a pustule of the scalp (Fig. 1F and G), were diagnostic of MF and psoriasis respectively. The patient was

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**Table 1**

| SERIES OF TREATMENT | MEDICATION | TREATMENT DURATION | INITIAL BSA (%) | BEST RESPONSE (%) BSA | %BSA AT THE END OF TREATMENT |
|---------------------|------------|-------------------|-----------------|------------------------|-----------------------------|
| **PATIENT’S TREATMENT FOR PSORIASIS** | | | | | |
| 1 | Acitretin 35 mg qd | 3 months | 100 | 50 | 100 |
| 2 | Adalimumab 40 mg q2w + MTX 7.5 mg qw | 4 months | 100 | 0 | 100 |
| 3 | Acitretin 25 mg qd | 7 months | 100 | 60 | 100 |
| 4 | Secukinumab 300 mg q4w | 8 months | 100 | 70 | 80 |
| 5 | Adalimumab 40 mg q2w | 3 months | 80 | 70 | 80 |
| 6 | Ustekinumab 90 mg | Once | 80 | 80 | 100 |
| **PATIENT’S TREATMENT FOR MF** | | | | | |
| 7 | Bexarotene 300 mg qd | 6 months | 100 | 42 | 97 |
| 8 | Interferon a-2b 3MIU tiw | 6 weeks | 97 | 35 | 85 |
| 9 | Interferon a-2b 3MIU tiw + MTX 10 mg qw | 2 weeks | 85 | 75 | 75 |
| **PATIENT’S TREATMENT FOR MF AND PSORIASIS** | | | | | |
| 10 | MTX 20 mg qw | 6 weeks | 75 | 68 | 73 |
| 11 | Acitretin 30 mg qd | 3 weeks | 73 | 70 | 70 |
| 12 | Bexarotene 300 mg qd + acitretin 25 mg qd | 2 months | 70 | 35 | 35 |

Abbreviations: BSA: Body Surface Area; MF: mycosis fungoides; MTX: methotrexate.
consequently treated with a combination treatment targeting both MF and psoriasis (Table 1), and till today he has remained in partial remission.

2.2. Second case

A 55-year-old male Caucasian patient with a 4-year history of psoriasis presented with erythematous scaly plaques and recent diagnosis of bullous pemphigoid (BP) under remission, was hospitalized in the Dermatology Department with a newly appearing tumor on the right side of his chin. The latter appeared after 2 months of immunosuppressive treatment with cyclosporine for BP (Fig. 2A and B).

Histology from the tumor of the chin and two specimens from psoriasiform plaques from his back and thigh respectively revealed MF and MF plaques with psoriasiform characteristics. (Fig. 2C). CT imaging, peripheral blood smear examination and immunophenotyping by flow cytometry were unremarkable. The MF stage was T3N0M0B0 (stage Ib).

The patient underwent low dose Total Skin Electron Beam (TSEB) therapy (12 Gy) with complete response and remained completely clear for 18 months, after which he presented with a 1.5 cm psoriasiform plaque on his left sole (Fig. 2D), which was treated with electron beam therapy.

3. Discussion

Psoriasis and MF share common pathogenetic features associated with the abnormal function of T-cells although the precise mechanism of abnormal T-cell stimulation and migration is still under investigation. Both psoriasis and early MF exhibit a Th1 phenotype while recent data support a prevailing role of Th17 immune response in psoriasis and IL17 intracellular pathway [26,28]. Based on our cases, we underscore the abnormal T-cell stimulation and migration is still under investigation.

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Data on the association between CTCL and non-anti-TNFα biologics are scant. There have been no reported cases connecting the onset of MF with the anti-IL12/23 biologic ustekinumab. Interestingly, Yoo et al. have shown the histopathologic confirmation of MF after 12 and 8 weeks of secukinumab ( interleukin-17A antagonist) use for psoriasis treatment in two cases [28]. Inhibition of the Th17-mediated immune response may theoretically lead to further immunosuppression and disease progression in CTCL by shifting the Th17/Tregs equilibrium towards Tregs that may play an important role in the pathogenesis of CTLC [28]. However, the major limitation of this study was the non-performance of a baseline skin biopsy before secukinumab initiation, implying that the two patients may have probably suffered from MF instead of psoriasis. Additionally, these patients had failed to respond to other psoriasis treatments before secukinumab, such as apermilast, NB-UVB phototherapy and acitretin. Interestingly, there have also been reported CTCL-like cases triggered by drugs [67]. However, these cases should not be considered true lymphomas, but rather lymphomatoid drug reactions. Their prominent characteristic is that the dermopathy subsides with the withdrawal of the incriminating medication. Therefore, these cases should not be confused with true lymphomas that could be trig- erved by TNFα inhibitors [66].

4. Conclusion
Psoriasis and MF are two distinct entities sharing common patho- genetic features associated with the abnormal activation of T-cells. Nonetheless, there is growing evidence that psoriatic patients may develop MF in the course of the disease. Dermatologists should be aware of an elevated risk of CTCL, particularly MF, in patients with psoriasis. To what degree psoriasis itself through chronic immune stimulation, or the medications used for its treatment or comorbidities and lifestyle may play a role in the onset of MF is not yet clear. There is not sufficient evidence to support a causal association between the use of biological therapies and MF in patients with psoriasis. Besides, MF can be an imitator of psoriasis – both clinically and histopathologically – an entity referred to as “psoriasiform MF”. Biopsy of the cutaneous lesions before the introduction of biologics should be incorporated in the clinical practice. Biopsy of the cutaneous lesion should also be performed in the case of appearance of psoriasiform lesions during biologic treatment for autoimmune disorders because this may represent an indolent form of MF. Psoriatic patients with poor or no response to treatment should be examined thoroughly for MF using immunohistochemistry and, if necessary, molecular biology techniques. In cases where histologic features of both MF and psoriasis are found, combination treatment should be given addressing both disorders. A large multicentric registry of MF patients who were treated for benign dermatoses (i.e. eczema, psoriasis) with classic immunosuppressive drugs and/or biologics is needed to collect data and further clarify the enigmatic association between psoriasis, MF and immunomodulatory treatment. Finally, larger well-designed prospective studies in patients with histologically confirmed psoriasis are required to elucidate the association between psoriasis, its treatment and MF.

Financial support
None.

Declaration of competing interest
No conflict of interest to disclose.

References
[1] Scarsbrick JJ, Quaglini P, Prince HM, Papadavid E, Hodak E, Bagot M, Servije O, Berti E, Ortiz-Romero P, et al. The PROCLIPI international registry of early-stage mycosis fungoides identifies substantial diagnostic delay in most patients. Br J Dermatol 2019;181(2):350-7. https://doi.org/10.1111/bjd.17258.

[2] Biondo G, Cerroni L, Brunasso AMG, Sola S, Cota C, Javors S, Massone C. Risk of mycosis fungoides in psoriatic patients: a critical review. J Eur Acad Dermatol Venereol 2020;34(6):1186-95. https://doi.org/10.1111/jdv.15600.

[3] Papadavid E, Katsimitri P, Kapnari I, Koumaki D, Karamarpaa A, Dalamaga M, Tzannis K, Boumpas DT, Rigopoulos D. Prevalence of psoriatic arthritis and its correlates among patients with psoriasis in Greece: results from a large retrospective study. J Eur Acad Dermatol Venereol 2016;30(10):1749-52. https://doi.org/10.1111/jdv.13706.

[4] Papadavid E, Dalamaga M, Vlami K, Kapnaki D, Gyftopoulos S, Christodoulou GS, Papiris S, Rigopoulos D. Psoriasis is associated with risk of obstructive sleep apnea independently from metabolic parameters and other comorbidities: a large hospital-based case-control study. Sleep Breath 2017;21(4):949-58. https://doi.org/10.1007/s11327-017-1507-4.

[5] Dalamaga M, Papadavid E. Can we better stratify our choice of pharmacotherapy for patients with co-morbid psoriasis and obesity? Exp Opin Pharmacother 2019; 20(11):1303-8. https://doi.org/10.1080/14656666.2019.163294.

[6] Paroutoglou K, Papadavid E, Christodoulou GS, Dalamaga M. Deciphering the association between psoriasis and comorbidities: current evidence and future treatment considerations. Curr Obes Rep 2020;5(3):165-75. https://doi.org/10.1007/s13679-020-00380-3.

[7] Theodorakopoulou E, Dalamaga M, Katsimitri P, Boumpas DT, Papadavid E. How does the joint dermatology-rheumatology clinic benefit both patients and dermatologists? Dermatol Ther 2020;33(3):e13283. https://doi.org/10.1111/dth.13283.

[8] Korovessi A, Dalamaga M, Kotopoulou M, Papadavid E. Adherence to the Mediterranean diet is independently associated with psoriasis risk, severity, and quality of life: a cross-sectional observational study. Int J Dermatol 2019;58(9): e1645. https://doi.org/10.1111/ijd.14523.

[9] Papadavid E, Ferra D, Koumaki D, Dalamaga M, Stamou C, Theodorakopoulou K, Rigopoulos D. Ustekinumab induces fast response and maintenance of a baseline skin biopsy before secukinumab initiation, implying that the two patients may have probably suffered from MF instead of psoriasis. Therefore, these cases should not be confused with true lymphomas that could be trig- erved by TNFα inhibitors [66].

Financial support
None.

Declaration of competing interest
No conflict of interest to disclose.

References
[1] Scarsbrick JJ, Quaglini P, Prince HM, Papadavid E, Hodak E, Bagot M, Servije O, Berti E, Ortiz-Romero P, et al. The PROCLIPI international registry of early-stage mycosis fungoides identifies substantial diagnostic delay in most patients. Br J Dermatol 2019;181(2):350-7. https://doi.org/10.1111/bjd.17258.
Kamstrup MR, Skov L, Zachariae C, Thyssen JP, Egeberg A. Psoriasis and risk of malignant lymphoma: a population-based cohort study. Br J Dermatol 2018;178(2):343–6. https://doi.org/10.1111/bjd.17093.

Gelfand JM, Shin DB, Neiman AL, Wang X, Margolis DJ, Troxel AB. The role of lymphoma in patients with psoriasis. J Invest Dermatol 2006;126(10):2194–201. https://doi.org/10.1111/j.0022-202X.2006.21947.x.

Nikolaou V, Papadavid E, Aravantinos A, Marinou L, Moustou E, Karampolidou K, Papadaki T, Stratigos A, Antoniou C. Mycosis fungoides in the era of antitumour necrosis factor-α treatments. Br J Dermatol 2015;173(2):590–3. https://doi.org/10.1111/bjd.13185.

Nikolaou V, Marinou L, Moustou E, Papadavid E, Economidi A, Christofidou E, Gereochristou M, Tasidou A, Economaki E, Stratigos A, Antoniou C. Psoriasis in patients with mycosis fungoides: a clinicopathological study of 25 patients. J Eur Acad Dermatol Venereol 2017;31(11):1484–52. https://doi.org/10.1111/jdv.14365.

Donigian JM, Snowden C, Carter JB, Kimball AB. The temporal association between cutaneous T-cell lymphoma and psoriasis: implications for common biologic processes. J Eur Acad Dermatol Venereol 2016;30(10):e31–2. https://doi.org/10.1111/jdv.1328.

Joo Y, Shay F, Velangi S, Stewart G, Scarisbrick JS. Secukinumab for treatment of psoriasis: does secukinumab precipitate or promote the presentation of cutaneous T-cell lymphoma? Clin Exp Dermatol 2019;44(4):414–7. https://doi.org/10.1111/ced.13797.

Dalamaga M, Karanikolas K, Matekovich A, Migdalis I, Papadavid E. Cutaneous manifestations in relation to immunologic parameters in a cohort of primary myelodysplastic syndrome patients. J Eur Acad Dermatol Venereol 2008;22(5):543–8. https://doi.org/10.1111/j.1468-3083.2007.02520.x.

Papadavid E, Kapsimali V, Psarra A, Antoniou C, Papasteriadi C, Ekonomidou J, Papadavid E, Spanos N, Dionysios-Asteriou A. Platelet markers correlate with glycemic indices in diabetic, but not diabetic-myelodysplastic patients with normal platelet count. Dis Markers 2010;29(1):55–61. https://doi.org/10.3233/DMA-2010-010726.

Marouga A, Dalamaga M, Kastania AN, Kroupiu C, Lagiou M, Siamantos K, Dimas K, Vlahakos DV. Circulating resistin is a significant predictor of mortality independently from cardiovascular comorbidities in elderly, non-diabetic subjects with chronic kidney disease. PLoS ONE 2016;21(1):73–9. https://doi.org/10.1371/journal.pone.0151186.

Dalamaga M, Polyzos SA, Karanikolas K, Chamberland J, Leka A, Triantafili M, Migdalis I, Papadavid E, Mantzoros CS. Fetuin-A levels and free leptin index are reduced in patients with chronic kidney disease, with or without overt adiposopathy. Nephrol Dial Transplant 2016;31(8):1331–7. https://doi.org/10.1093/ndt/gfw209.

Dalamaga M, Potonis A, Dalamaga M, Karmaniolas K, Chamberland J, Nikolaidou A, Lekka A, Triantafilli M, Gerochristou M, Tasidou A, Economaki E, Stratigos A, Antoniou C, Koliaki C, Liatis S, Dalamaga M, Kokkinos A. Sarcopenic obesity: epidemiologic evidence, pathophysiology, and therapeutic perspectives. Curr Obes Rep 2019;8(2):344–8. https://doi.org/10.1007/s13679-019-00359-9.

Dalamaga M, Polyzos SA, Karanikolas K, Chamberland J, Leka A, Triantafili M, Migdalis I, Papadavid E, Mantzoros CS. Fetuin-A levels and free leptin index are reduced in patients with chronic kidney disease, with or without overt adiposopathy. Nephrol Dial Transplant 2016;31(8):1331–7. https://doi.org/10.1093/ndt/gfw209.
trial (RESTORE2). Br J Dermatol 2013;168(6):1325–34. https://doi.org/10.1111/bjd.12404.

[66] Martínez-Escala ME, Posligua AL, Wickless H, Rutherford A, Sable KA, Rubio-Gonzalez B, Zhou XA, Kaplan JB, Pro B, Choi J, Querfeld C, Rosen ST, Guitart J. Progression of undiagnosed cutaneous lymphoma after anti-tumor necrosis factor-alpha therapy. J Am Acad Dermatol 2018;78(6):1068–76. https://doi.org/10.1016/j.jaad.2017.12.068.

[67] Magro CM, Olson LC, Nguyen GH, de Feraudy SM. CD30 positive lymphomatoid angiocentric drug reactions: characterization of a series of 20 cases. Am J Dermopathol 2017;39(7):508–17. https://doi.org/10.1097/DAD.0000000000000692.