Co-existence of psoriasis and cutaneous T-cell lymphoma

Running head: Psoriasis and cutaneous T-cell lymphoma

Joseph Scott,¹,² Chester Lai,¹,² George Coltart,¹,² Andrew Bates,³ Luke Bennett,³ Matthew Sommerlad,⁴ Vipul Foria⁴ and Eugene Healy¹,²

1. Dermatopharmacology, Faculty of Medicine, University of Southampton, Southampton, UK
2. Dermatology, University Hospital Southampton NHS Foundation Trust, Southampton, UK
3. Oncology, University Hospital Southampton NHS Foundation Trust, Southampton, UK
4. Histopathology, University Hospital Southampton NHS Foundation Trust, Southampton, UK

Corresponding author: Prof Eugene Healy.

Email: ehealy@soton.ac.uk

Funding sources: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of interest: None declared.

Data Availability: The data underlying this article are available in the article and its online supplementary material.

Ethics Statement: Not applicable
Abstract

It has been reported that individuals with psoriasis are at an increased risk of developing cutaneous T-cell lymphoma (CTCL). However, the increased risk of lymphoma in these patients has been questioned because CTCL in its early stages may be incorrectly labelled as psoriasis, thus introducing potential for misclassification bias. We retrospectively reviewed patients with a confirmed diagnosis of CTCL seen in a tertiary cutaneous lymphoma clinic (n = 115) over a 5-year period and found that 6 (5.2%) patients had clinical evidence of co-existing psoriasis. This demonstrates that there is a small cohort of individuals who develop both psoriasis and CTCL.

Introduction

An increased risk of lymphoma in patients with psoriasis has been reported in the General Practice Research Database\textsuperscript{1,2}. While this risk includes cutaneous T-cell lymphoma (CTCL), it is recognised that the differential diagnosis of psoriasis can include CTCL\textsuperscript{3,4} hence clinicians may wonder whether the perceived risk of CTCL in patients with psoriasis might be due to the incorrect diagnosis of psoriasis in patients with early-stage CTCL. Indeed, Biondo et al\textsuperscript{5} conducted a critical review of this topic and concluded that the higher risk of CTCL in psoriatic patients “should be reconsidered in the light of the bias of misclassification and the low magnitude reported in previous studies”.

Report

Thirteen of 115 patients with CTCL (confirmed on histology, immunostaining, T-cell receptor (TCR) polymerase chain reaction) attending our tertiary CTCL clinic over a 5-year period (2017-2022) had psoriasis listed as a co-morbidity. Following review of patients in clinic and their case notes, six (5.2%) had clinical evidence of both psoriasis and CTCL; all six patients had been seen on multiple occasions by a consultant dermatologist (EH) with >30 years’ clinical dermatology experience, who has led the combined skin lymphoma clinic for >15 years and has led a separate complex psoriasis
Clinic for >20 years. Here, we report the clinical details of each of these six individuals so that the nature of, and basis for, both diagnoses is clear. None of these cases have previously been included in any other reported case series of coexisting psoriasis and CTCL.

**Case 1:** A 62-year-old woman with psoriasis since her mid-thirties presented to our dermatology department. Her psoriasis had affected the scalp, hands, elbows (Figure 1a, b), knees and vulva, with onycholysis and pitting of the fingernails. There was also a family history of psoriasis. She was treated with topical anti-psoriatic therapies with clinical improvement. The patient presented three years later with a different rash which appeared eczematous affecting the buttocks, chest, and neck (Figure 1c, d). Treatment with narrowband ultraviolet B (NB-UVB) phototherapy was planned but due to clinical deterioration, the patient was admitted to hospital. A skin biopsy showed an infiltrate consisting of atypical lymphocytes and epidermotropism on histology (Figure 1e). These lymphocytes expressed CD3 (Figure 1f), had loss of CD7 (Figure 1g) and showed clonal TCR beta and gamma profiles. Treatment of her CTCL with chlorambucil provided a good clinical response. Currently, she has minimal evidence of CTCL but has psoriasis affecting the elbows.

**Case 2:** A 57-year-old woman with psoriasis developed atrophic plaques with central areas of purpura in the infra-mammary and inguinal regions, consistent with the poikilodermatous variant of mycosis fungoides (MF) which was subsequently confirmed on biopsy. She had pustular psoriasis affecting the palms and soles and had previously been under the care of several dermatologists for >10 years with chronic plaque psoriasis and palmoplantar pustulosis and had received treatment with methotrexate, acitretin and hydroxycarbamide, with documented periods of psoriatic remission. Following development of her CTCL, the patient was reviewed in a regional dermatology meeting where it was agreed by multiple consultant dermatologists that the patient had both CTCL and psoriasis.

**Case 3:** A 64-year-old man had psoriasis affecting the elbows, knees and scalp since age 50 years and was managed in primary care with calcipotriol ointment (Figure 2a, b). He also had a family history of psoriasis. He presented to the dermatology department with an asymptomatic, purple nodule on the left buttock (Figure 2c). Biopsy of this lesion demonstrated a dense lymphoid infiltrate with epidermotropism on histology (Figure 2d, e), abnormal CD3-positive (Figure 2f) and
CD8-positive cells with loss of CD5 (Figure 2g). CD30 positive cells were also present. He was referred to the combined CTCL clinic whereupon he was noted to have erythematous patches with fine scale over the trunk and legs consistent with MF, but also had evidence of psoriasis affecting his elbows and knees. He subsequently developed another nodular lesion on the left buttock which displayed similar histological findings to the earlier nodule, and clonal TCR beta and gamma gene rearrangements consistent with CTCL. His CTCL remains stable with occasional use of topical corticosteroids.

Case 4: A 36-year-old woman developed a nodule on the left nasal ala whilst taking fingolimod for multiple sclerosis (MS). She had a history of psoriasis affecting the occiput and posterior vertex of the scalp, and behind the ears, since adolescence which she controlled with topical steroids. Biopsy of the nasal lesion demonstrated a dense dermal infiltrate of atypical CD3-positive lymphocytes, with some lymphocytes extending into the epidermis, loss of CD7 and CD8, and clonal TCR beta and gamma gene rearrangements. She was referred to the combined CTCL clinic and developed further lesions on the left arm, philtrum and lower lip. Biopsy of the philtrum and left arm lesions showed similar findings to the previous biopsy. She was treated with radiotherapy and fingolimod was discontinued. Her MS was subsequently treated with dimethyl fumarate, and she has not developed any new CTCL lesions.

Case 5: A 48-year-old man developed patches and plaques which were clinically considered as CTCL and confirmed as CTCL on biopsy. He had a history of psoriasis affecting the elbows, knees and scalp since adolescence and had been managed successfully for many years in primary care with topical anti-psoriatic agents. Treatment with denileukin diftitox (Ontak) resulted in clinical remission of his CTCL and a significant improvement in his psoriasis (for which Ontak had been trialled previously).

Case 6: A 44-year-old man had a 16-year history of patch and plaque stage MF which had been diagnosed and treated by his local dermatologist with input from another tertiary UK CTCL service for 15 years. Skin histology demonstrated epidermotropism and a dermal folliculotrophic lymphoid infiltrate, with loss of CD5 and a clonal TCR beta and gamma profile. He subsequently developed symmetrical papulosquamous lesions affecting his elbows consistent with psoriasis at age 40.
years. He was referred to our combined CTCL clinic in 2021 with CTCL lesions affecting his left eyelid and left hip and was noted to have psoriasis on both elbows and distal onycholysis of his fingernails. His CTCL is currently well-controlled following skin-directed radiotherapy.

While it can be challenging in some cases to distinguish whether a patient has CTCL with psoriasis or CTCL alone, we believe that the patients described here had both conditions. We accept that some dermatologists may query the validity of a psoriasis diagnosis without histological evidence of psoriasis in patients who subsequently develop CTCL. However, psoriasis is diagnosed clinically rather than histologically in the vast majority of cases and skin biopsy is rarely required to establish the diagnosis of psoriasis, which was also the case for the patients included in this report. It is also possible that some dermatologists may question reports of psoriasis and concomitant CTCL in cases where authors simply report on the number of patients with both conditions, rather than providing the clinical details of each individual case, hence our reason for providing the clinical details of each case separately in this report. Interestingly, the proportion (5.2%) of our CTCL patients with psoriasis is similar to the 7.8% of CTCL patients who had co-existing psoriasis reported by Nikolaou et al.7 Moreover, as the prevalence of psoriasis is 2.8% of the UK population8, the 5.2% prevalence of psoriasis in our CTCL patients is higher than expected, but it would not be possible to conclude from this observation that the risk of CTCL is raised in patients with psoriasis. Five of our patients developed CTCL after psoriasis, therefore we think it important to carefully examine patients with psoriasis for atypical areas that may represent concomitant CTCL and to investigate appropriately if the latter diagnosis is considered.

Learning points

• Patients with psoriasis have been reported to have an increased risk of developing lymphoma, including cutaneous T-cell lymphoma.
• Early-stage cutaneous T-cell lymphoma may sometimes be incorrectly diagnosed as inflammatory skin disease, including psoriasis.
• A critical review in 2020 on this topic concluded the association between cutaneous T cell lymphoma and psoriasis is still unclear.

• We report the clinical details of six patients who have both cutaneous T-cell lymphoma and psoriasis, confirming that some patients have both these skin disorders.

• Clinicians need to consider cutaneous T-cell lymphoma in patients with psoriasis who develop skin lesions which are atypical for psoriasis.

Acknowledgements

We are grateful to the patients with cutaneous T cell lymphoma and concomitant psoriasis who agreed to participate in the preparation of this report.

References


Legend for figures

Figure 1

(a,b) Psoriasis affecting the elbows. (c,d) Patch- and plaque-stage CTCL. Histological examination of CTCL skin (e) demonstrated a superficial dermal infiltrate consisting of atypical lymphocytes and epidermotropism. Haematoxylin and eosin, original magnification (e) x 100. Immunohistochemistry demonstrating (f) CD3 positive lymphocytes, with (g) relative loss of CD7 expression. Original magnification (f,g) x 40.

Figure 2

(a,b) Psoriasis affecting the elbows and knees. (c) Nodule on the left buttock confirmed as CTCL. Histological examination of skin nodule (d) demonstrated a dense lymphocytic infiltrate extending from the upper dermis into the superficial subcutis. (e) Infiltrate consisting of atypical medium-to-large lymphocytes with moderate cytoplasm and coarse nuclear chromatin. Haematoxylin and eosin, original magnification (d) x 10; (e) x 100. Immunohistochemistry demonstrating (f) CD3 positive lymphocytes, with (g) loss of CD5 expression. Original magnification (f,g) x 20.
Figure 1
190x245 mm (x DPI)
Figure 2
190x269 mm (x DPI)