University of Dundee

A new approach to Actinic Folliculitis

Butt, S.; Dawe, R.; Blair, R.; Ibbotson, S.

Published in:
Clinical and Experimental Dermatology

DOI:
[10.1111/ced.14518](https://doi.org/10.1111/ced.14518)

Publication date:
2021

Document Version
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):

Butt, S., Dawe, R., Blair, R., & Ibbotson, S. (2021). A new approach to Actinic Folliculitis: prophylactic narrowband ultraviolet B phototherapy. *Clinical and Experimental Dermatology*, 46(4), 675-679.
<https://doi.org/10.1111/ced.14518>

General rights

Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from Discovery Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

DR SANAA BUTT (Orcid ID : 0000-0001-8300-6552)

DR ROBERT S. DAWE (Orcid ID : 0000-0002-4732-071X)

DR SALLY H IBBOTSON (Orcid ID : 0000-0001-5685-752X)

Article type : Original Article

A new approach to Actinic Folliculitis: prophylactic narrowband UVB phototherapy

S. Butt,¹ R. Dawe,¹ R. Blair² and S. Ibbotson¹

¹ Photobiology Unit, Dermatology Department, University of Dundee, Ninewells Hospital & Medical School, Dundee, UK

² Dermatology Department, Royal Alexandra Hospital, Paisley

Corresponding author: Sanaa Butt,

Email: Sanaa.butt@gmail.com

Funding sources: none

Conflicts of interest: none declared

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/CED.14518](https://doi.org/10.1111/CED.14518)

This article is protected by copyright. All rights reserved

What's already known about this topic?

- Actinic folliculitis is a rare idiopathic photodermatosis presenting with a photodistributed monomorphic pustular eruption.
- Actinic folliculitis encompasses both acne aestivalis and superficial actinic folliculitis. The aetiology currently remains unknown.

What does this study add?

- We demonstrate the successful use of phototesting, using UVA provocation as a diagnostic tool in actinic folliculitis.
- We report on the first cases of successful management of actinic folliculitis using prophylactic narrowband Ultraviolet B (nb-UVB) phototherapy.

Summary

Background: We have observed an increasing number of patients referred to the Scottish Photobiology Service (SPS), who are diagnosed with Actinic Folliculitis (AF) and have positive phototesting. Treatment options for AF are limited, with only few reports in the literature. The use of prophylactic narrowband Ultraviolet-B (nb-UVB) phototherapy for AF has not previously been described and we report on this for the first time.

Aim: We analysed the clinical characteristics, phototesting results and responses to treatment for patients with AF diagnosed in the SPS.

Methods: We undertook a retrospective review over a ten-year period of all case notes of patients who were assessed and diagnosed with AF through the SPS, based in the Photobiology Unit, Dundee, Scotland.

Results: All 10 patients were female. Mean age of onset was 25 years; mean time to referral for investigation was seven years. The commonest site involved was the face, with the main clinical feature being monomorphic pustules appearing following sunlight exposure. The eruption was provoked with iterative doses of broadband UVA irradiation in five patients. All patients were offered photoprotective advice and prophylactic nb-UVB phototherapy. Five patients proceeded with phototherapy; four completed the desensitisation course and all four reported either a delay in symptom onset or total prevention of rash induction, with complete efficacy of desensitisation maintained for three years in one patient.

Conclusion: We demonstrate the successful use of UVA provocation testing as a diagnostic tool in AF. Additionally, we recommend the use of prophylactic nb-UVB phototherapy in AF as an effective and well-tolerated approach.

Introduction

Actinic folliculitis (AF) is a rare photodermatosis, which classically presents with clusters of monomorphic pustules on photo-exposed sites following sunlight exposure. We have been increasingly aware of such patients referred to the Scottish Photobiology Service (SPS), a tertiary photodiagnostic service, based at the Photobiology Unit in Dundee, Scotland. We sought to

describe the clinical features and phototesting findings of these patients diagnosed with AF and offer insights into the successful use of Narrowband UVB (nb-UVB) phototherapy.

Patients & Methods

This case series included all patients with a diagnosis of AF who presented to the SPS between January 2010 and December 2019. We retrospectively reviewed the case notes and investigation findings of patients identified. Consent was obtained from all patients.

Phototesting was undertaken on the back using a monochromator irradiation device (Bentham, Reading UK), with dose-series at UVB, UVA and visible wavebands ($305 \pm \frac{1}{2}$ maximum bandwidth) 5nm, 335 ± 27 nm, 365 ± 27 nm, 400 ± 27 n and 430 ± 27 nm). Erythema responses (minimal erythema doses; MEDs) were assessed immediately and at seven and 24 hours. Broadband UVA provocation ($5\text{--}20 \text{ Jcm}^{-2}$) was performed at a typically affected site using the metal halide UVASPOT 400T (Hönle, Munich Germany), with responses reviewed 24 hours following iterative doses over two days.

Clinical Features

All 10 patients were female. Mean age of onset was 25 (range 16 - 35) years, with mean time to presentation for investigation being 7 (range 2 - 12) years. Photo-exposed sites were commonly involved, typically the face (100%, $n = 10$), followed by chest (50%, $n = 5$), neck (50%, $n = 5$), back (40%, $n = 4$) and limbs (20%, $n = 2$) (**Table 1**).

The most notable clinical feature was clustered monomorphic pustules, seen in all patients (**Figure 1**). Other common features were erythema (80%, $n = 8$), scale (30%, $n = 3$), itch and a preceding tingling sensation (20%, $n = 2$). Papules were reported in one, tightness in another and resolution with fine scars that eventually resolved was also reported by one patient (10%, $n = 1$ respectively). All patients reported symptoms developing shortly after exposure to sunlight with a range of onset of 15 minutes to one week. The eruption resolved between two days and three weeks. Two patients also reported the phenomenon of hardening by the end of summer.

Both UK and overseas sunlight exposure was reported as a trigger. Two patients reported sunlight in the UK triggered the eruption, 3 patients reported sunlight on holiday alone and 5 patients reported both sunlight in the UK and on holiday triggered the eruption. Window glass-

transmitted sunlight could induce the eruption in six patients. Medications were the combined oral contraceptive (n=2) and amitriptyline (n=1), but were not considered relevant. Sunscreens could delay symptom onset in 3 patients.

One patient reported her mother had a similar sunlight-induced eruption, which resolved over time. There was a family history of atopy (n=2), psoriasis (n=2) and acne (n=2).

Investigation findings

Bacterial and fungal swabs and culture and antinuclear antibodies and extractable nuclear antigen were negative in all patients. Fungal scrapings showed hyphae on microscopy in one patient who also had concurrent pityrosporum folliculitis. Importantly, we felt this was a co-occidental to the main presentation as she only had the eruption provoked by sunlight exposure. Scraping from the UVA positive site were negative for pityrosporum.

Monochromator phototesting was normal in all cases except one (patient 9), who had abnormally low 24-hour UVA MEDs (centred at 335 and 365nm). Iterative broadband UVA irradiation provoked a pustular rash in keeping with described symptoms in five patients (**Table 1 & Figure 2**). In one further patient minimal erythema was induced, whilst the remaining four cases were negative. Photopatch testing was performed in two patients and was negative. Nb-UVB MED was in the normal reference range in all cases including those who did not receive nb-UVB as a treatment.

Management

Photoprotection in the form of behavioural modification, environmental advice, clothing and hat choices and broadspectrum sun protection factor 50 sunscreen was advised for all patients. The patient with coincidental pityrosporum folliculitis was treated with topical ketoconazole.

All patients were offered prophylactic nb-UVB phototherapy (Philips, Eindhoven) and five proceeded with treatment, planned for three times weekly over 5 weeks. The remaining five either declined treatment due to inconvenience, opted for alternative treatment or have yet to initiate treatment due to suspended services in the context of the 2020 COVID pandemic. Of those who proceeded with nb-UVB phototherapy two reported full resolution of their symptoms in terms of complete prevention of induction of further episodes, one patient reported a

moderate reduction in symptoms and delayed onset, indicative of partially effective prophylaxis and they have planned further sessions. Another patient reported mild improvement in the form of delayed onset of rash induction. One of the patients reported no improvement with phototherapy but discontinued early, after only six treatments. No side effects were reported.

One patient had trialled a tetracycline (type unknown) prior to referral to our centre, with resolution of rash, although recurrence on drug cessation. We also recommended lymecycline 408mg once daily for one patient, but with no effect.

Discussion

Hjorth et al described a seasonal acneiform eruption in 1972 and called this 'Acne Aestivalis' (AA) or 'Mallorca Acne'¹. A monomorphic pustular eruption on photodistributed sites following sunlight exposure was reported in 40 Scandinavian patients vacationing in the Mediterranean during springtime. Similar to our cohort, this predominantly affected women (female = 37) and young adults, between 20 - 30 years old. Conventional acne treatment was not found to be helpful.

An analogous entity Actinic Superficial Folliculitis (ASF) was described in 1985 by Neiboer. He reported two cases of a photoinduced non-pruritic superficial pustular eruption presenting in a similar distribution to AA². In 1985 Verbov postulated that AA and ASF were the same entity due to the prominent overlap of clinical features and suggested they both be classified as AF³.

Phototesting has not always been reported to produce the eruption in AF. However, in our case-series we were able to induce the eruption in half of the patients, through the use of iterative broadband UVA provocation. The pathogenesis of AF is thought to predominantly implicate UVA radiation, as supported by the spring time incidence and the trigger of sunlight exposure through window glass^{4,5}. An additional hypothesis is that follicular gland occlusion may result from epidermal thickening induced by UV radiation⁶. However, the aetiology remains elusive and as such AF remains an idiopathic photodermatosis.

Few successful treatment options have been described in the literature, with three cases of response to topical tretinoin^{1,6} and three cases to oral isotretinoin^{4,7} being described. Several of

our patients reported the phenomenon of hardening toward the end of summer supporting our proposition for the use of prophylactic nb-UVB phototherapy. The majority of those who did engage with the full course of treatment found a moderate to complete resolution of AF induction for the duration of that year, with the hardening effect being maintained for three years in one subject. We think that narrowband UVB should be discussed as a treatment option with patients. For many patients an advantage is not having to take a systemic medication. A disadvantage of phototherapy is that treatment often requires repeated hospital visits, although this inconvenience can be mitigated with the use of home phototherapy. We wished to highlight the use of prophylactic nb-UVB phototherapy as an effective and safe therapy for AF.

Acknowledgment: We would like to thank Hannah Naasan for her contribution to these cases.

References

1. Mills OH, Kligman AM. Acne Aestivalis. *Arch Dermatol*. 1975; 111(7):891-892.
2. Nieboer C. Actinic superficial folliculitis; a new entity? *Br J Dermatol*. 1985;May: 112(5):603–6.
3. Verbov J. Actinic Folliculitis. *Br J Dermatol*. 1985;Nov:113(5):630–1.
4. Veysey EC, George S. Actinic folliculitis. *Clin Exp Dermatol*. 2005 Nov;30(6):659-61
5. Jaeger C, Hartschuh W, Jappe U. Actinic superficial folliculitis. *J Eur Acad Dermatology Venereol*. 2003 Sep;17(5):562-5.
6. Rahman S, Powell J, Al-Ismael D. First reported cases of actinic folliculitis treated successfully with topical retinoid. *Clin Exp Dermatol*. 2020. Aug;45(6):716-718.
7. Norris PG, Hawk JLM. Actinic folliculitis—response to isotretinoin. *Clin Exp Dermatol*. 1989 Jan;14(1):69-71.

Patient	Age/ Gender/Skin Type^	Site	Time to onset/ clearance	Clinical features	Iterative UVA provocation	Management	Follow up
1	28/F/II	Lower face (chin, cheeks, nose, upper lip)	2 hours/6 days	Small erythematous papules, evolves to monomorphic pustules	2 x 20 Jcm ⁻² Forearm: grade 1 erythema Back: grade 1 erythema	Photoprotection*	Declined active treatment Improved with time & photoprotection measures
2	34/F/II	Face, neck, upper chest, back, frontal scalp	15 minutes/5 days	Erythema, pruritus, monomorphic pustules	2 x 20 Jcm ⁻² Right chest: Pustular response	Photoprotection* Ketoconazole shampoo Prophylactic nb-UVB phototherapy	Full resolution following nb-UVB phototherapy Additionally, a reduction in symptoms lasted for 3 years
3	38/F/II	Chin, cheeks, forehead, neck and anterior chest	unknown/4 days	Monomorphic pustules, preceding tingling	1x 10 Jcm ⁻² and 20 Jcm ⁻² Neck: pustular response	Photoprotection* Prophylactic nb-UVB phototherapy	Full resolution following nb-UVB phototherapy for 1 year
4	25/F/III	Central forehead, left cheek, left chin, left neck	72 hours/2-3 weeks	Erythema, monomorphic pustules, scale on clearance	1 x 10 and 20 Jcm ⁻² Jaw: brown pigment	Photoprotection* Prophylactic nb-UVB phototherapy	Did not complete nb-UVB phototherapy course, discontinued after 6 sessions No improvement

5	44/F/II	Forehead, chin, neck, anterior chest, upper back	2-3 hours/1-2 weeks	Erythema, pustules, resolve with scale	2 x 20 Jcm ⁻² Chest: grade 2 erythema and pustules	Photoprotection* Tetracycline antibiotic	Declined nb-UVB phototherapy Improvement with tetracycline
6	25/F/II	Face, upper chest and back, neck, occipital hair line, dorsal arms	30 mins/5 days	Erythema, pustules, resolves with scale	1 x 20 Jcm ⁻² Left upper back: grade 2 erythema + pustules and follicular response	Photoprotection*	Reduced flares with photoprotection Declined nb-UVB phototherapy
7	30/F/II	Lower cheeks, jaw line, sides of neck and forehead	24 hours/7 days	Pruritus, monomorphic pustules	1 x 10 Jcm ⁻² and 20 Jcm ⁻² Jawline: negative response	Photoprotection* Prophylactic nb-UVB phototherapy (at home)	Improvement with photoprotection Nb-UVB phototherapy delayed onset of rash
8	36/F/II	Mid face, nasolabial folds, cheeks, chin and forehead	12 hours/2-3 days	Erythema, preceding tightness, monomorphic pustules	2 x 20 Jcm ⁻² Back: grade 1 + pigment 2 x 5 Jcm ⁻² Neck: negative response	Photoprotection* Lymecycline 408mg Prophylactic nb-UVB phototherapy	Reduced flare with photoprotection No improvement with tetracycline Not yet tried nb-UVB phototherapy
9	27/F/II	Face, upper chest	2 days/4 days	Erythema, preceding tingling, monomorphic pustules, resolving with fine scars	2 x 20 Jcm ⁻² Left cheek: pustular response	Photoprotection* Prophylactic nb-UVB phototherapy	Moderate improvement with nb-UVB phototherapy Repeat nb-UVB phototherapy course suspended due to 2020 COVID pandemic

10	37/F/III	Chin, back of shoulders, thighs	1 week/3 weeks	Erythema, pustules	2 x 20 Jcm ⁻²	Photoprotection*	Nb-UVB phototherapy pending 2020 COVID pandemic
					Right inner forearm: brown pigment	Prophylactic nb-UVB phototherapy	

Table 1. Clinical features, phototesting results, treatment and outcomes of patients with actinic folliculitis. *Photoprotection advice includes behavioural and environmental advice as well as protective clothing & topical sunscreen use (all were advised to use a broadspectrum sunscreen). ^Fitzpatrick skin phototype.

Figure 1. (a) Distinct monomorphic pustules appearing across a photodistributed site, the forehead, of a patient following sunlight exposure. (see table, patient 5). (b) Widespread pustules scattered across the back in the same patient.

Figure 2. (a) Naturally provoked eruption, following exposure to sunlight, consisting of monomorphic pustules (see table, patient 6). (b) The appearance of erythema and early pustule formation, appearing at 24 hours following artificial UVA provocation, on the left upper shoulder. (c) At 48 hours post artificial UVA provocation there was clear evidence of monomorphic pustules.

ced_14518_f1a.jpg

ced_14518_f1b.jpg

ced_14518_f2a.jpg

ced_14518_f2b.jpg

ced_14518_f2c.png