Dermatol Ther (Heidelb) (2025) 15:697–705
https://doi.org/10.1007/s13555-025-01355-9

ORIGINAL RESEARCH

Diagnostic Accuracy of Polarized and Ultraviolet Fluorescence-Induced Dermoscopy in Scarring and Nonscarring Alopecias: a Retrospective Observational Multicentric Study

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Received: November 25, 2024 / Accepted: January 31, 2025 / Published online: February 21, 2025

ABSTRACT

Introduction: There is growing evidence that ultraviolet-induced fluorescence (UVF) dermoscopy may improve diagnostic accuracy in non-neoplastic dermatoses, yet data on hair disorders are scarce. The aim of this observational retrospective study was to compare the accuracy of polarized dermoscopy and UVF-dermoscopy in characterizing and distinguishing scarring and nonscarring alopecias.

Methods: A total of 84 patients were enrolled, with 43 and 41 patients suffering from nonscarring and scarring alopecias, respectively. Analyzed variables included scarring findings (i.e., dotted/globular, structureless or perifollicular bright white areas on both polarized and UVF-dermoscopy) and follicular unit (i.e., hair or follicular ostia, with the latter appearing as empty follicular openings and follicular red/blue fluoresce on polarized and UVF-dermoscopy, respectively). Comparative analysis between polarized and UVF-dermoscopy in detecting the above-mentioned features and differentiating scarring from nonscarring alopecias were performed, also assessing possible differences according to the skin tone. Interobserver agreement was evaluated for both dermoscopic settings.

Results: UVF-dermoscopy was superior ($p<0.01$) to polarized dermoscopy in detecting follicular ostia and white bright areas in general and fair-skinned patients, while only follicular ostia were better seen under this setting in skin of color. Additionally, UVF-dermoscopy was found to be more accurate ($p<0.01$) in differentiating nonscarring from scarring alopecias when considering all and light phototypes. Finally, Kappa values were 0.57 and 0.83 for polarized and UVF-dermoscopy, respectively.

Conclusions: UVF-dermoscopy may be a valuable and reliable complementary tool in differentiating scarring and nonscarring alopecias, especially in light phototypes.

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Keywords: Alopecias; Dermoscopy; Diagnosis; Differential diagnosis; Hair disorders

Key Summary Points

Why carry out this study?

Scarring and nonscarring alopecias can be challenging to differentiate, and current diagnostic tools have limitations, particularly in specific skin tones.

Despite evidence suggesting ultraviolet-induced fluorescence (UVF) dermoscopy may enhance diagnostic accuracy in non-neoplastic dermatoses, its utility in hair disorders remains underexplored.

This study investigated whether UVF-dermoscopy improved diagnostic accuracy compared with polarized dermoscopy in distinguishing scarring from nonscarring alopecias, and how skin tone influences these outcomes.

What was learned from the study?

UVF-dermoscopy outperformed polarized dermoscopy in identifying follicular ostia and bright white areas in all and fair-skinned patients, with superior accuracy in differentiating scarring from nonscarring alopecias, particularly in light phototypes.

The findings suggest the potential for UVF-dermoscopy to refine diagnostic algorithms in hair disorders, though further studies are needed to validate its application across diverse skin tones and broader clinical settings.

INTRODUCTION

Prompt diagnosis is a crucial step when it comes to both scarring and nonscarring alopecias to establish appropriate treatment and prevent further damage to the hair follicle. In this regard, dermoscopy has significantly improved diagnostic accuracy, thus decreasing the number of instances needing biopsy [1]. In particular, dermoscopic examination has been shown to facilitate the recognition of several alopecic disorders by revealing specific clues. However, distinguishing scarring from nonscarring alopecias may pose some difficulties in cases typified by poorly specific or subtle dermoscopic findings. Additionally, data on skin of color in such instances is limited, with consequent lack of information on a wide population suffering from hair disorders.

Over the last few years, ultraviolet fluorescence-induced (UVF) dermoscopy [UV-light source (365 nm) exciting skin chromophores and evokes fluorescence] is more frequently used as a complementary assessment to polarized dermoscopy, displaying a significant improvement in terms of diagnostic performance, including neoplastic, infectious, and inflammatory dermatoses [2]. In this retrospective observational multicentric study, we sought to investigate for the first time the diagnostic accuracy of polarized and UVF-dermoscopy in distinguishing scarring and nonscarring alopecias as compared with polarized dermoscopy in both fair and dark skin.

METHODS

This was a multicentric observational retrospective analysis involving five dermatological centers from Italy (Udine), India (Srinagar and Bhubaneswar), Nigeria (Nnewi), and Poland (Poznań). Consecutive patients with scarring and nonscarring alopecias were diagnosed according to either histology or typical clinical findings/course (only for nonscarring instances). We only considered cases with availability of high-quality dermoscopic iconography of the target area (i.e., area from which bioptic sample was taken or the most representative lesion on clinical ground) captured at 10× magnification under both UV-light (dry setting) and polarized-light (dry setting, with possible additional use of a fluid interface based on physician evaluation). Patients having received specific therapies within 3 months before examination were ruled out to avoid biases related to possible changes of dermoscopic patterns by treatment. Patients' age and gender were recorded. All the images,

collected by multiple investigators at the different centers, were randomly evaluated by two independent experienced investigators (not simultaneously) to identify findings of scarring (i.e., dotted/globular, structureless or perifollicular bright white areas on both polarized and UVF-dermoscopy) or evidence of follicular unit (i.e., hair or follicular ostia, with the latter appearing as empty follicular openings and follicular red/blue fluoresce on polarized and UVF-dermoscopy, respectively); see Tables 1 and 2 for further details. Evaluators were not involved in data collection to avoid recall bias. Interobserver agreement was evaluated for both polarized and UVF dermoscopic pictures through Cohen's kappa coefficient. Afterward, a second meeting between evaluators to reach a consensus was conducted, with the final decision to mark as present/absent based on unanimous agreement. Fisher's exact test with p-value set at 0.01 was used for comparative analyses. The patients in this manuscript provided informed consent for the publication of case details, and institutional approval was not required, as the study was based on data retrospectively collected in a routine clinical setting (AIFA Determination, 20 March 2008). This study complies with the Declaration of Helsinki and no ethical approval was required as it results from clinical routinary activity. Consent for publication of the images was obtained from all patients included in the study.

RESULTS

A total of 84 patients [43 patients with nonscarring alopecia and 41 patients with scarring alopecia; phototypes I–III 45 (24 of them with nonscarring alopecia and 21 with scarring alopecia) and phototypes IV–VI 39 (19 of them with nonscarring alopecia and 20 with scarring alopecia)] were included in the study. For all instances, hand-held dermatoscope *Dermlite DL5* (San Juan Capistrano, CA, United States) coupled with a high-resolution camera or smartphone was employed.

In terms of prevalence of dermoscopic findings regardless of skin tone, follicular ostia were detected more commonly in nonscarring alopecias by using UVF-dermoscopy (83.7% versus 34.9%; $p<0.001$), while no statistically significant difference was found when it came to other dermoscopic features. Further, the only finding showing significant different prevalence between polarized and UVF-dermoscopic assessment in scarring alopecias turned out to be bright white areas (70.7% versus 30.1%; $p=0.002$). Similar results ($p<0.01$) were observed when considering the subgroup of patients with fair skin, with follicular ostia (especially sparse distribution) and bright white areas being better visible with UFV-dermoscopy in nonscarring and scarring alopecias, respectively. Conversely, only follicular ostia (especially diffuse distribution) were detected more frequently in the cohort of dark-skinned patients with nonscarring alopecias ($p<0.01$). For further analytical details see Table 1; Figs. 1 and 2 depict some examples of the main clues in fair and dark skin.

Moving to the comparative analysis between polarized and UVF-dermoscopy in distinguishing nonscarring from scarring alopecias, we found the latter to be the only dermoscopic setting showing statistically significant differences between the two groups when considering all the phototypes. Specifically, UFV-dermoscopic examination showed a higher accuracy in highlighting follicular ostia (in general, 83.7% versus 26.8%, and diffuse distribution, 46.5% versus 26.8%; $p<0.001$) and white bright areas (70.7% versus 34.1; $p=0.002$) as points of differentiation. When considering instances according to phototypes (fair and dark skin), we found overlapping results, apart from the detection of bright white areas, which were significantly more common in scarring alopecias under both polarized and UVF-dermoscopy ($p<0.001$). Details are presented in Table 2.

Finally, in terms of interobserver concordance, we found significant agreement between evaluators, with Kappa values being 0.57 ("moderate") and 0.83 ("almost perfect") for polarized and UVF-dermoscopy, respectively.

Table 1 Comparative analysis between polarized and ultraviolet-induced fluorescence (UVF) dermoscopy in highlighting findings typical of nonscarring and scarring alopecias in general and considering fair (I–III) and dark (IV–VI) phototypes

Dermoscopic findings	Nonscarring alopecia			Scarring alopecia		
	Polarized dermoscopy	UVF-dermoscopy	*p*-value*	Polarized dermoscopy	UVF-dermoscopy	*p*-value*
All phototypes (n = 43 nonscarring and 41 scarring alopecia)						
Hairs[a]	81.4% (35)	74.4% (32)	0.604	68.6% (24)	51.2% (21)	0.658
Sparse distribution	46.5% (20)	39.5% (17)	0.663	41.5% (17)	34.1% (14)	0.649
Diffuse distribution	34.9% (15)	34.9% (15)	1.000	17.1% (7)	17.1% (7)	1.000
Follicular ostia[b]	34.9% (15)	83.7% (36)	< **0.001**	17.1% (7)	26.8 (11)	0.424
Sparse distribution	23.3% (10)	46.5% (20)	0.041	17.1% (7)	26.8 (11)	0.424
Diffuse distribution	11.6% (5)	47.2% (16)	0.011	0.0% (0)	0.0% (0)	1.000
Bright white areas[c]	11.6% (5)	7.0% (3)	0.713	34.1% (14)	70.7% (29)	**0.002**
Phototypes I–III (n = 24 nonscarring and 21 scarring alopecia)						
Hairs[a]	83.3% (20)	75.0% (18)	0.724	66.7% (14)	61.9% (13)	1.000
Sparse distribution	50.0% (12)	45.8% (11)	1.000	47.6% (10)	42.8% (9)	1.000
Diffuse distribution	33.3% (8)	29.2% (7)	1.000	19.1% (4)	19.1% (4)	1.000
Follicular ostia[b]	33.3% (8)	83.3% (20)	**0.001**	14.3% (3)	28.6% (6)	0.454
Sparse distribution	20.8% (5)	62.5% (15)	**0.008**	14.3% (3)	28.6% (6)	0.454
Diffuse distribution	12.5% (3)	20.8% (5)	0.701	0.0% (0)	0.0% (0)	1.000
Bright white areas[c]	16.7% (4)	12.5% (3)	1.000	19.1% (4)	95.2% (20)	< **0.001**
Phototypes IV–VI (n = 19 nonscarring and 20 scarring alopecia)						
Hairs[a]	78.9% (15)	73.7% (14)	1.000	50.0% (10)	40.0% (8)	0.751
Sparse distribution	42.1% (8)	31.6% (6)	0.737	35.0% (7)	25.0% (5)	0.731
Diffuse distribution	36.8% (7)	42.1% (8)	1.000	15.0% (3)	15.0% (3)	1.000
Follicular ostia[b]	36.8% (7)	84.2% (16)	**0.007**	20.0% (4)	25.0% (5)	1.000
Sparse distribution	26.3% (5)	26.3% (5)	1.000	20.0% (4)	25.0% (5)	1.000
Diffuse distribution	10.5% (2)	57.9% (11)	**0.005**	0.0% (0)	0.0% (0)	1.000
Bright white areas[c]	5.3% (1)	0.0% (0)	1.000	50.0% (10)	45.0% (9)	1.000

Bold is used to highlight results with a degree of statistical significance (e.g., a *p*-value less than 0.01)

**p*-value < 0.01 deemed as statistically significant (analyses performed according to Fisher's exact test)

[a]Either dystrophic or non-dystrophic hairs

[b]Follicular openings on polarized dermoscopy; red/blue fluoresce on UVF-dermoscopy

[c]Dotted/globular, structureless or perifollicular bright white areas

Table 2 Comparative analysis between polarized and ultraviolet-induced fluorescence (UVF) dermoscopy in distinguishing nonscarring from scarring alopecias in general and considering fair (I–III) and dark (IV–VI) phototypes separately

Dermoscopic findings	Polarized dermoscopy			UVF-dermoscopy		
	Nonscarring alopecias	Scarring alopecias	*p*-value*	Nonscarring alopecias	Scarring alopecias	*p*-value*
All phototypes	(*n* = 43 patients)	(*n* = 41 patients)		(*n* = 43 patients)	(*n* = 41 patients)	
Hairs[a]	81.4% (35)	68.6% (24)	0.031	74.4% (32)	51.2% (21)	0.041
Sparse distribution	46.5% (20)	41.5% (17)	0.666	39.5% (17)	34.1% (14)	0.656
Diffuse distribution	34.9% (15)	17.1% (7)	0.084	34.9% (15)	17.1% (7)	0.084
Follicular ostia[b]	34.9% (15)	17.1% (7)	0.084	83.7% (36)	26.8 (11)	< **0.001**
Sparse distribution	23.3% (10)	17.1% (7)	0.590	46.5% (20)	26.8 (11)	0.074
Diffuse distribution	11.6% (5)	0.0% (0)	0.056	47.2% (16)	0.0% (0)	< **0.001**
Bright white areas[c]	11.6% (5)	34.1% (14)	0.019	7.0% (3)	70.7% (29)	< **0.001**
Phototypes I–III	(*n* = 24 patients)	(*n* = 21 patients)		(*n* = 24 patients)	(*n* = 21 patients)	
Hairs[a]	83.3% (20)	66.7% (14)	0.299	75.0% (18)	61.9% (13)	0.520
Sparse distribution	50.0% (12)	47.6% (10)	1.000	45.8% (11)	42.8% (9)	1.000
Diffuse distribution	33.3% (8)	19.1% (4)	0.329	29.2% (7)	19.1% (4)	0.503
Follicular ostia[b]	33.3% (8)	14.3% (3)	0.177	83.3% (20)	28.6% (6)	< **0.001**
Sparse distribution	20.8% (5)	14.3% (3)	0.705	62.5% (15)	28.6% (6)	0.036
Diffuse distribution	12.5% (3)	0.0% (0)	0.236	20.8% (5)	0.0% (0)	0.051
Bright white areas[c]	16.7% (4)	19.1% (4)	1.000	12.5% (3)	95.2% (20)	< **0.001**
Phototypes IV–VI	(*n* = 19 patients)	(*n* = 20 patients)		(*n* = 19 patients)	(*n* = 20 patients)	
Hairs[a]	78.9% (15)	50.0% (10)	0.096	73.7% (14)	40.0% (8)	0.054
Sparse distribution	42.1% (8)	35.0% (7)	0.748	31.6% (6)	25.0% (5)	0.731
Diffuse distribution	36.8% (7)	15.0% (3)	0.155	42.1% (8)	15.0% (3)	0.082

Table 2 continued

Dermoscopic findings	Polarized dermoscopy			UVF-dermoscopy		
	Nonscarring alopecias	Scarring alopecias	*p*-value*	Nonscarring alopecias	Scarring alopecias	*p*-value*
Follicular ostia[b]	36.8% (7)	20.0% (4)	0.301	84.2% (16)	25.0% (5)	< **0.001**
Sparse distribution	26.3% (5)	20.0% (4)	0.716	26.3% (5)	25.0% (5)	1.000
Diffuse distribution	10.5% (2)	0.0% (0)	0.231	57.9% (11)	0.0% (0)	< **0.001**
Bright white areas[c]	5.3% (1)	50.0% (10)	< **0.001**	0.0% (0)	45.0% (9)	< **0.001**

Bold is used to highlight results with a degree of statistical significance (e.g., a *p*-value less than 0.01)

*p-value < 0.01 deemed as statistically significant (analyses performed according to Fisher's exact test)

[a]Either dystrophic or non-dystrophic hairs

[b]Follicular openings on polarized dermoscopy; red/blue fluoresce on UVF-dermoscopy

[c]Dotted/globular, structureless or perifollicular bright white areas

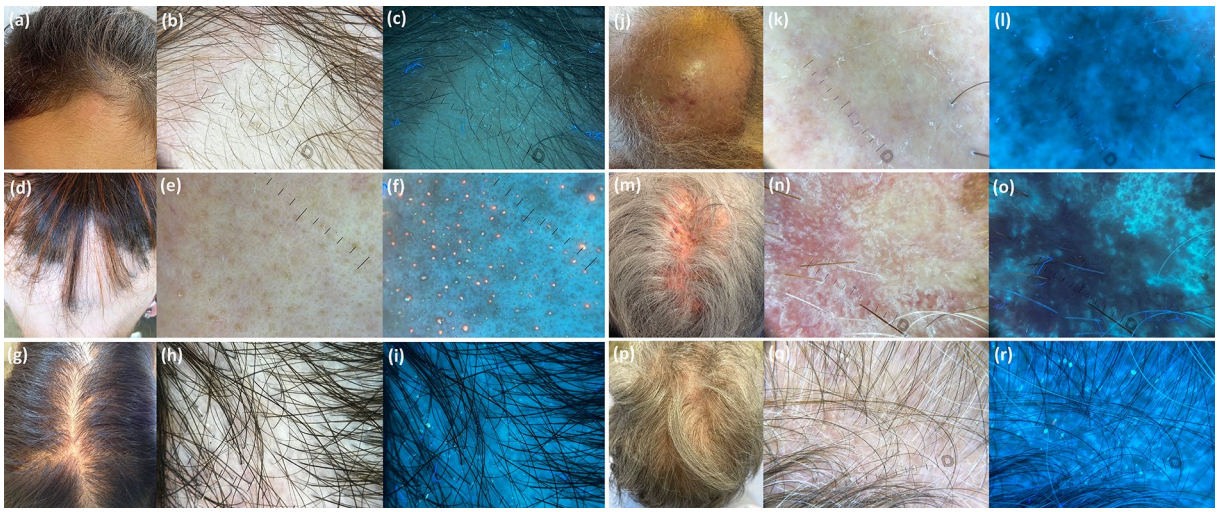

Fig. 1 Examples of nonscarring and scarring alopecias in fair-skinned patients. A case of *tinea capitis* (clinical image—**a**); on both polarized (**b**) and ultraviolet fluorescence-induced (UVF)-dermoscopy (**c**) is possible to see residual hairs but no clear follicular ostia. *Alopecia areata* (clinical image—**d**); polarized dermoscopy displays empty follicular openings seen as yellow dots (**e**), more evident under UVF-dermoscopy as red fluorescent follicular dots (**f**). *Androgenetic alopecia* (clinical image—**g**); polarized dermoscopic examination shows residual thinned hairs but no follicular ostia (**h**), partially seen under UV-light as sparse blue follicular dots related to follicular hyperkeratosis (**i**). *Lichen planopilaris in advanced stage* (clinical image—**j**); polarized dermoscopy reveals loss of hairs and some bright white fibrotic areas (**k**), by far more evident by UVF-dermoscopic assessment (**l**). *Discoid lupus erythematosus* (clinical image—**m**); white fibrotic areas are not very clear under polarized dermoscopy (**n**), whereas they are very evident by using UVF-dermoscopy (**o**). *Lichen planopilaris* in early stage (clinical image—**p**); globular fibrotic white areas are subtle on polarized dermoscopy (**q**), while they are much more clear under UV-light along with sparse blue follicular fluorescence due to follicular hyperkeratosis (**r**)

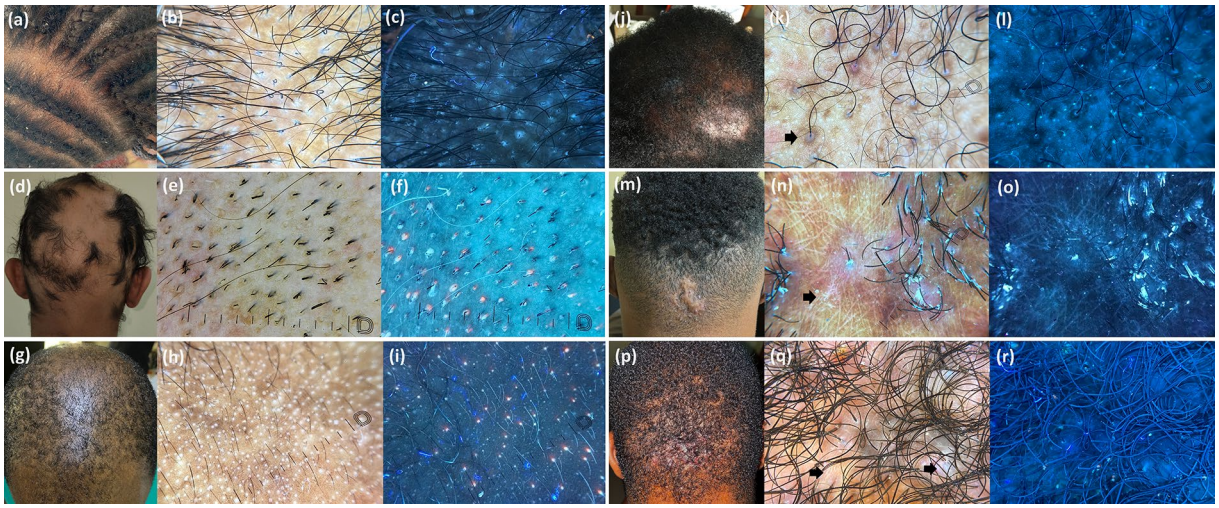

Fig. 2 Examples of nonscarring and scarring alopecias in dark-skinned patients. *Tinea capitis* (clinical image—**a**); residual hairs are visible under both polarized (**b**) and ultraviolet fluorescence-induced (UVF)-dermoscopy (**c**), but clear follicular ostia are not distinguishable in both cases. *Alopecia areata* (clinical image—**d**); polarized dermoscopy shows some yellow dots (**e**) and UVF dermoscopy reveals red fluorescent dots corresponding to empty follicular openings (**f**). *Androgenetic alopecia* (clinical image—**g**), follicular openings are difficult to see under polarized dermoscopy (**h**), while UV dermoscopy displays diffuse red follicular fluorescence (**i**). *Central centrifugal cicatricial alopecia* (clinical image—**j**); polarized dermoscopy reveals peripilar white–grey halo (arrow) corresponding to perifollicular concentric fibrosis (**k**), less evident under UVF-dermoscopy (**l**). *Acne keloidalis nuchae in advanced stage* (clinical image—**m**); white fibrotic areas are better seen under polarized dermoscopy examination (arrow) (**n**) compared with UVF-dermoscopy, likely due to the presence of overlying scaling reducing light reflection from fibrosis (**o**). *Acne keloidalis nuchae in early stage* (clinical image—**p**); even in this instance, white fibrotic areas are better evident with polarized dermoscopy (arrows) (**q**) than UVF-dermoscopy (**r**) due to the higher contrast with surrounding dark scalp in the former

DISCUSSION

Our analysis supports the usefulness of UVF-dermoscopy as a supportive diagnostic tool in the recognition of scarring and nonscarring alopecias thanks to the evidence of specific skin chromophores elicited by UV light. In particular, such a dermoscopic setting was more accurate to highlight both follicular openings and fibrotic areas, thereby allowing a more precise characterization of both such groups of alopecias compared with polarized dermoscopic assessment. Specifically, follicular openings in balding regions appeared as either red or blue fluorescent follicular dots, with the former likely resulting from the presence of coproporphyrin III/protoporphyrin IX produced by *Corynebacteria* and the latter possibly due to follicular scaling/hyperkeratosis [3–7]. The presence of these fluorescent findings was already described as a possible point of characterization of nonscarring hair disorders in a recent case report [8].

Additionally, along with the better visualization of follicular ostia under UVF-dermoscopy, we found that such a dermoscopic setting also turned out to be superior in identifying white bright areas, likely due to the higher contrast with surrounding normal skin resulting from the intense UV-light reflection of fibrotic tissue [3].

Importantly, no data on specific skin tone were available from the literature. This was a relevant bias, as diagnostic performance significantly changes between fair and dark phototypes according to our findings. In particular, UVF-dermoscopy showed a superior accuracy in terms of follicular ostia and bright white areas detection only in light-skinned patients,

whereas just the former finding was better visible compared with polarized dermoscopy in skin of color. The lack of significant differences between the two settings in highlighting white bright areas might be explained by (I) the higher performance of polarized light in identifying fibrotic findings in dark scalp (because of the greater contrast between white areas and normal pigmented background typical of darker phototypes) and (II) the higher tendency to have overlying scaling reducing the UV-reflection of scarring areas [3].

Notably, besides revealing the higher performance of UVF over polarized dermoscopy in showing the presence of follicular ostia and fibrotic areas, our study also confirmed a diagnostic superiority of the former when comparing scarring and nonscarring alopecias, thus making a valuable assessment in their differential diagnosis. Moreover, the interobserver agreement analysis showed a significant superiority when it comes to UVF-dermoscopy, thereby supporting that findings visible under this dermoscopic assessment are much easier to detect, with consequent higher reproducibility in research settings.

Limitations

The main limitations of the study include (I) the retrospective design, which is prone to recall and observation biases, addressed by involving evaluators who did not contribute to the sample collection; (II) the lack of dermoscopic-pathological correlation analysis; and (III) the potential variability introduced by having multiple investigators collecting the images at different centers, however, the use of the same dermoscopic device reduced the relevance of such a bias. Therefore, future studies addressing such points are needed to confirm our preliminary data.

CONCLUSIONS

Our findings corroborate the growing evidence that UVF dermoscopy can serve as a valuable diagnostic adjunct to polarized dermoscopy for the recognition and distinction of scarring and nonscarring alopecias, especially in fair-skinned populations.

ACKNOWLEDGEMENTS

Authorship. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published.

Author Contributions. Noemi Plozner, MD: data collection, analysis, and drafting of the manuscript; Enzo Errichetti, MD: conceptualization, design and methodology design, statistical analysis, interpretation of results, and critical revision of the manuscript; Nkechi Anne Enechukwu: data collection, drafting and reviewing of the manuscript; Yasmeen J Bhat: data collection, drafting and reviewing of the manuscript; Biswanath Behera: data collection, drafting and reviewing of the manuscript; Pawel Pietkiewicz: data collection, drafting and reviewing of the manuscript.

Funding. No funding or sponsorship was received for this study or publication of this article.

Data Availability. All data generated or analyzed during this study are included in the article.

Declarations

Conflict of Interest. Enzo Errichetti is a member of the journal's Editorial Board; he was not involved in the selection of peer reviewers for the manuscript nor any of the subsequent editorial decisions. Noemi Plozner, Nkechi Anne Enechukwu, Yasmeen J Bhat, Biswanath Behera, and Paweł Pietkiewicz have nothing to disclose.

Ethical Approval. The patients in this manuscript provided informed consent for the publication of case details, and institutional approval was not required, as the study was based on data retrospectively collected in a routine clinical setting (AIFA Determination, 20 March 2008). This study complies with the Declaration of Helsinki and no ethical approval was required as it results from clinical routinary activity. Consent for publication of the images was obtained from all patients included in the study.

REFERENCES

1. Errichetti E. Dermoscopy of inflammatory dermatoses (inflammoscopy): an up-to-date overview. Dermatol Pract Concept. 2019;9:169–80.
2. Pietkiewicz P, Navarrete-Dechent C, Goldust M, Korecka K, Todorovska V, Errichetti E. Differentiating Fordyces pots from their common simulators using ultraviolet-induced fluorescence dermatoscopy—retrospective study. Diagnostics (Basel). 2023;13:985.
3. Errichetti E, Pietkiewicz P, Bhat YJ, Salwowska N, Szlązak P, Stinco G. Diagnostic accuracy of ultraviolet-induced fluorescence dermoscopy in non-neoplastic dermatoses (general dermatology): a multicentric retrospective comparative study. J Eur Acad Dermatol Venereol. 2024. https://doi.org/10.1111/jdv.19795.
4. Yasuma A, Ochiai T, Azuma M, et al. Exogenous coproporphyrin III production by *Corynebacterium aurimucosum* and *Microbacterium oxydans* in erythrasma lesions. J Med Microbiol. 2011;60:1038–42.
5. Gupta LK, Singhi MK. Wood's lamp. Indian J Dermatol Venereol Leprol. 2004;70:131–5.
6. Klatte JL, van der Beek N, Kemperman PM. 100 years of Wood's lamp revised. J Eur Acad Dermatol Venereol. 2015;29:84.
7. Dyer JM, Foy VM. Revealing the unseen: a review of Wood's lamp in dermatology. J Clin Aesthet Dermatol. 2022;15:25–30.
8. Li X, Zhou C. Ultraviolet-induced fluorescence dermoscopy aids in distinguishing scarring and nonscarring alopecia: enhancing identification of hair follicle openings: the potential of ultraviolet-induced fluorescence dermoscopy in hair loss diagnosis. J Am Acad Dermatol. 2024;91:e1-2.