Section: DVL

Original Research Article

ROLE OF DERMOSCOPY IN ASSESSING THERAPEUTIC RESPONSE TO TACROLIMUS VERSUS TOPICAL CLOBETASOL IN PATIENTS WITH LIMITED ALOPECIA AREATA

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Received *: 16/04/2026*
Received in revised form *: 08/06/2026*
Accepted *: 23/06/2026*

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DOI: 10.70034/ijmedph.2026.3.262

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 1648-1652

ABSTRACT

Background: Alopecia areata is a common autoimmune disorder characterized by non-scarring hair loss, often associated with unpredictable clinical course and psychological distress. Dermoscopy has emerged as a valuable, non-invasive tool for diagnosis and monitoring therapeutic response. Topical corticosteroids and calcineurin inhibitors are widely used treatments. However, comparative data assessing their efficacy using dermoscopic parameters remain limited, necessitating studies to evaluate their role in monitoring treatment outcomes.
Aims: To assess and compare the therapeutic response of topical tacrolimus versus topical clobetasol in patients with limited alopecia areata and to determine the utility of dermoscopy in monitoring treatment response.
Materials and Methods: This prospective comparative study was conducted over a period of 10 months at a tertiary care center, including 60 patients clinically diagnosed with limited alopecia areata. Patients were randomly divided into two groups of 30 each. Group A received topical tacrolimus (0.1%) ointment, while Group B received topical clobetasol propionate (0.05%) cream. Treatment was administered twice daily for 12 weeks. Clinical assessment and dermoscopic evaluation was performed. Assessments were conducted at baseline, 6 weeks, and 12 weeks. Data were analyzed using appropriate statistical tests, with $p < 0.05$ considered statistically significant.
Results: The majority of patients were in the 21–30 years age group (24; 40.0%), with a slight female predominance (34; 56.7%). At baseline, dermoscopic features such as yellow dots (48; 80.0%), black dots (42; 70.0%), and broken hairs (39; 65.0%) were commonly observed. At 12 weeks, Group B (clobetasol) showed significantly greater clinical improvement, with a mean SALT score reduction of 62.5% compared to 41.3% in Group A ($p < 0.05$). Dermoscopically, a marked reduction in black dots and broken hairs was noted in 23 (76.7%) patients in Group B versus 16 (53.3%) in Group A. Vellus hair regrowth was observed in 21 (70.0%) patients in the clobetasol group compared to 14 (46.7%) in the tacrolimus group.
Conclusion: Dermoscopy is a reliable and sensitive tool for assessing therapeutic response in alopecia areata. Topical clobetasol demonstrated superior clinical and dermoscopic improvement compared to tacrolimus. However, tacrolimus remains a safer alternative for long-term use due to fewer side effects. Early dermoscopic changes can help guide treatment decisions and improve patient outcomes.
Keywords: Alopecia areata; Clobetasol; Dermoscopy; Tacrolimus; Therapeutic response.

INTRODUCTION

Alopecia areata is a common, chronic, immune-mediated disorder characterized by non-scarring hair loss affecting the scalp and other hair-bearing areas. It is estimated to affect nearly 1–2% of the general population at some point in their lifetime.[2] The disease typically presents as well-defined patches of

hair loss and may progress to more extensive forms such as alopecia totalis or universalis.[3] Although the exact etiology remains unclear, it is widely accepted that autoimmune mechanisms targeting hair follicles in the anagen phase play a central role. Genetic predisposition, environmental triggers, and psychological stress have also been implicated in disease onset and progression.[3]

The clinical course of alopecia areata is highly variable and unpredictable, with spontaneous remissions and recurrences commonly observed. This uncertainty often leads to significant psychological distress, impacting self-esteem, social interactions, and overall quality of life. Therefore, early diagnosis and timely initiation of effective treatment are crucial in improving outcomes and minimizing disease progression.[4,5]

Topical corticosteroids, particularly clobetasol propionate, remain the mainstay of treatment for limited alopecia areata due to their potent anti-inflammatory and immunosuppressive effects.[6] They act by suppressing T-cell mediated immune responses around the hair follicle, thereby promoting hair regrowth.[7] However, prolonged use is associated with potential adverse effects such as skin atrophy, telangiectasia, and folliculitis.8 On the other hand, topical tacrolimus, a calcineurin inhibitor, offers an alternative therapeutic approach by selectively inhibiting T-cell activation without causing skin atrophy. Despite its favorable safety profile, its efficacy in alopecia areata remains variable and less well established compared to corticosteroids.[9]

Traditionally, assessment of treatment response in alopecia areata has been primarily based on clinical observation and scoring systems such as the Severity of Alopecia Tool (SALT).[10] However, these methods may not detect early or subtle changes in disease activity. In this context, dermoscopy (trichoscopy) has emerged as a valuable, non-invasive diagnostic and monitoring tool. It allows visualization of characteristic features such as yellow dots, black dots, broken hairs, exclamation mark hairs, and vellus hair regrowth, which correlate with disease activity and therapeutic response. Dermoscopy can detect early regrowth before it becomes clinically apparent, thereby aiding in timely modification of treatment strategies.[11,12]

The role of dermoscopy extends beyond diagnosis to include prognostication and monitoring of treatment efficacy. Reduction in dystrophic hairs and appearance of regrowing vellus hairs are considered early indicators of therapeutic success.[13] Thus, dermoscopy provides an objective and reproducible method to evaluate response, minimizing reliance on subjective clinical assessment alone.

Despite the widespread use of topical corticosteroids and tacrolimus in the management of alopecia areata, there is a paucity of comparative studies evaluating their therapeutic outcomes using dermoscopic parameters. Most existing studies rely predominantly on clinical assessment, with limited emphasis on objective, tool-based monitoring. Furthermore, data from the Indian population, particularly in a tertiary care setting, remain scarce. The present study is designed to bridge this gap by systematically comparing the efficacy of topical tacrolimus and clobetasol using both clinical and dermoscopic parameters.

Aims and Objectives

- To assess and compare the therapeutic response of topical tacrolimus versus topical clobetasol in patients with limited alopecia areata using dermoscopic evaluation
- To determine the utility of dermoscopy in monitoring treatment response.

MATERIALS AND METHODS

This prospective comparative study was conducted in the Department of Dermatology, Venereology, and Leprosy at Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamil Nadu, over a period of 10 months from April 2025 to January 2026. A total of 60 patients clinically diagnosed with limited alopecia areata were enrolled in the study after obtaining informed written consent.

Inclusion criteria comprised patients aged 18–50 years with clinically diagnosed limited alopecia areata involving less than 25% of the scalp, those with disease duration less than one year, and patients who were willing to participate and provide informed consent. Both male and female patients were included in the study.

Exclusion criteria included patients with extensive alopecia areata (involvement >25% of the scalp), alopecia totalis or universalis, patients who had received systemic or topical treatment for alopecia areata within the past 4 weeks, individuals with other causes of hair loss such as androgenetic alopecia or scarring alopecia, patients with active scalp infections, pregnant or lactating women, and those with known hypersensitivity to study medications. Patients with significant systemic illness or immunosuppression were also excluded from the study to avoid confounding factors affecting treatment response.

Detailed history regarding onset, duration, progression of hair loss, associated symptoms, and previous treatment was recorded. A thorough clinical examination was performed in all cases, including assessment of the number, size, and site of alopecic patches. Baseline severity was assessed using the Severity of Alopecia Tool (SALT) score. Dermoscopic evaluation (trichoscopy) was carried out using a handheld dermoscope to document characteristic features such as yellow dots, black dots, broken hairs, exclamation mark hairs, and vellus hairs.

Patients were selected using a convenience sampling method from those attending the dermatology outpatient department. The study population was randomly divided into two groups of 30 patients

each. Group A received topical tacrolimus 0.1% ointment, and Group B received topical clobetasol propionate 0.05% cream. Patients were instructed to apply the medication twice daily over the affected areas for a duration of 12 weeks. Follow-up assessments were performed at 6 weeks and 12 weeks. At each visit, clinical improvement was assessed using the SALT score, and dermoscopic examination was repeated to evaluate changes in disease activity and regrowth patterns. Any adverse effects related to treatment were noted and documented.

The collected data were entered into Microsoft Excel and analyzed using SPSS version 26 software. Descriptive statistics such as mean and standard deviation were used for quantitative variables, while frequency and percentage were used for qualitative data. The independent t-test and paired t-test were applied to compare mean differences within and between groups. The chi-square test was used to assess associations between categorical variables. A p-value of <0.05 was considered statistically significant.

RESULTS

Most patients were young adults aged 21–30 years (40.0%) with a slight female predominance (56.7%). Single patch involvement (60.0%) and scalp-only disease (73.3%) were common, with the majority presenting early (<6 months). [Table 1]

Table 1: Sociodemographic and Clinical Profile

Variable	Category	n (%)
Age (years)	18–20	12 (20.0%)
	21–30	24 (40.0%)
	31–40	14 (23.3%)
	41–50	10 (16.7%)
Gender	Male	26 (43.3%)
	Female	34 (56.7%)
Number of patches	Single	36 (60.0%)
	Multiple	24 (40.0%)
Site of involvement	Scalp only	44 (73.3%)
	Scalp + others	16 (26.7%)
Duration	<6 months	38 (63.3%)
	6–12 months	22 (36.7%)

Yellow dots (80.0%) and black dots (70.0%) were the predominant dermoscopic features, indicating active disease. These findings support the utility of dermoscopy in baseline disease assessment. [Table 2]

Table 2: Baseline Dermoscopic Findings

Feature	Present n (%)
Yellow dots	48 (80.0%)
Black dots	42 (70.0%)
Broken hairs	39 (65.0%)
Exclamation mark hairs	28 (46.7%)

Clobetasol demonstrated significantly greater clinical and dermoscopic improvement compared to tacrolimus ($p < 0.05$). Enhanced vellus hair regrowth and reduction of dystrophic hairs highlight better therapeutic response. [Table 3]

Table 3: Comparison of Clinical and Dermoscopic Response (12 Weeks)

Parameter	Group A (Tacrolimus) n (%)	Group B (Clobetasol) n (%)	p-value
Mean SALT reduction	41.3%	62.5%	0.021
Reduction in black dots	16 (53.3%)	23 (76.7%)	0.048
Reduction in broken hairs	15 (50.0%)	22 (73.3%)	0.041
Vellus hair regrowth	14 (46.7%)	21 (70.0%)	0.045

Clobetasol group showed significantly better overall response ($p < 0.05$). Early disease and single patch involvement were strongly associated with favorable outcomes, emphasizing the importance of early intervention. [Table 4]

Table 4: Treatment Response and Correlation Factors

Variable	Category	Good Response n (%)	Poor Response n (%)	p-value
Overall response	Group A	25 (83.3%)	5 (16.7%)	0.039
	Group B	28 (93.3%)	2 (6.7%)	
Duration	<6 months	28 (73.7%)	10 (26.3%)	0.006
	6–12 months	8 (36.4%)	14 (63.6%)	
Number of patches	Single	26 (72.2%)	10 (27.8%)	0.018
	Multiple	10 (41.7%)	14 (58.3%)	

Adverse effects were more frequent in the clobetasol group, with statistically significant differences ($p < 0.05$). Tacrolimus showed a better safety profile with minimal side effects. [Table 5]

Table 5: Adverse Effects

Adverse Effect	Group A n (%)	Group B n (%)	p-value
Erythema	3 (10.0%)	7 (23.3%)	0.032
Folliculitis	1 (3.3%)	5 (16.7%)	
Skin atrophy	0 (0%)	3 (10.0%)	

DISCUSSION

Alopecia areata is a common autoimmune disorder characterized by variable clinical presentation and therapeutic response. In the present study of 60 patients with limited alopecia areata, the majority belonged to the 21–30 years age group, followed by 31–40 years, indicating a higher prevalence among young adults. A slight female predominance was observed, possibly reflecting increased cosmetic concern and healthcare-seeking behavior. Similar age distribution has been reported by Bains P et al,[14] and Raj C et al,[15] who also noted that alopecia areata commonly affects younger individuals. However, Fatima R et al,[16] reported a male predominance, suggesting that gender distribution may vary across populations.

Clinically, most patients in the present study had single patch involvement and lesions confined to the scalp, indicating early-stage disease. This was in agreement with Raj C et al,[15] who observed patchy alopecia as the most common presentation. A shorter duration of illness (<6 months) in the majority of patients highlights the importance of early diagnosis, as prolonged disease duration has been associated with poorer prognosis.

Dermoscopy findings in the present study, including yellow dots, black dots, broken hairs, and exclamation mark hairs, were indicative of active disease. These findings were consistent with studies by Bains P et al,[14] and Fatima R et al,[16] where yellow dots and black dots were the most frequent dermoscopic features. Furthermore, Raj C et al,[15] demonstrated that such dermoscopic markers are associated with disease severity and prognosis, reinforcing their diagnostic and predictive value. Additionally, Mahmoudi H et al,[17] documented similar dermoscopic patterns, including yellow dots and vellus hairs, emphasizing their role in disease assessment and prognosis.

In terms of treatment, the present study demonstrated superior efficacy of topical clobetasol over tacrolimus, with higher rates of clinical and dermoscopic improvement. These findings are supported by Sajjad D et al,[18] who reported significantly better hair regrowth with clobetasol (74.3%) compared to tacrolimus, and Ishaq M et al,[19] who also found higher treatment success with clobetasol (74.2% vs. 45.2%). Similarly, Fahim M et al,[20] observed greater reduction in SALT scores and higher efficacy with clobetasol.

However, other therapeutic approaches have also shown benefit. Nassar A et al,[21] reported significant reduction in SALT scores across multiple treatment groups, suggesting that various modalities can be effective. In contrast, Mahmoudi H et al,[22] noted significant improvement with isotretinoin in specific forms of alopecia, while Brinks AL et al,[23] reported favorable outcomes with topical calcineurin modulators, indicating their role as alternative or adjunct therapies.

The present study also found that shorter disease duration and limited disease extent (single patch) were associated with better outcomes. This was comparable to the study done by Raj C et al,[15] who observed that longer disease duration and higher severity scores were linked to poorer prognosis.

In terms of safety, although clobetasol was associated with mild adverse effects such as erythema, folliculitis, and skin atrophy, tacrolimus exhibited a better safety profile with minimal side effects. This is consistent with general clinical observations that topical calcineurin inhibitors are safer for long-term use, particularly in sensitive areas. This was similar to the findings by Brinks AL et al,[22] who reported good tolerability with calcineurin inhibitors.

The findings indicate that while both clobetasol and tacrolimus were effective in the management of limited alopecia areata, clobetasol demonstrates superior efficacy in terms of clinical and dermoscopic improvement. Dermoscopy serves as a valuable non-invasive tool for diagnosis and monitoring. However, given the variability in response and potential side effects, individualized treatment strategies and further large-scale studies are recommended to optimize management protocols.

CONCLUSION

Dermoscopy is a valuable, non-invasive tool for assessing disease activity and monitoring therapeutic response in patients with limited alopecia areata. Topical clobetasol demonstrated superior efficacy with greater clinical improvement and earlier dermoscopic signs of hair regrowth compared to topical tacrolimus. However, tacrolimus showed a better safety profile with fewer adverse effects. Early disease duration and limited lesion number were associated with improved outcomes. Thus, while clobetasol remains the more effective option, tacrolimus can be considered a safer alternative, particularly for long-term use, with dermoscopy aiding in objective and timely evaluation of treatment response.

Financial support and sponsorship: Nil.
Conflicts of interest: There are no conflicts of interest.

REFERENCES

1. Lintzeri DA, Constantinou A, Hillmann K, Ghoreschi K, Vogt A, Blume- Peytavi U. Alopecia areata–Current understanding and management. JDDG: Journal der Deutschen Dermatologischen Gesellschaft. 2022 Jan;20(1):59-90.
2. Ungar B, Renert-Yuval Y, Dlova NC, Jabbari A, King B, Mesinkovska NA et al. Alopecia areata. Nature Reviews Disease Primers. 2025 Nov 6;11(1):77.
3. Abarca YA, Scott-Emuakpor R, Tirth J, Moroz O, Thomas GP, Yateem D et al. Alopecia areata: understanding the pathophysiology and advancements in treatment modalities. Cureus. 2025 Jan 31;17(1).
4. Al-Sowayan NS, AlRebdi AK, AlMarwani MK. Understanding alopecia areata: types, causes, and latest therapeutic approaches. J Biosci Med. 2024;12(11):323-33.
5. Pratt CH, King LE, Messenger AG, Christiano AM, Sundberg JP. Alopecia areata. Nature reviews Disease primers. 2017 Mar 16;3(1):17011.
6. Gregoire S, McIntosh B, Sanchez K, Biba U, Mostaghimi A. Local corticosteroids for alopecia areata: A narrative review. Dermatology and Therapy. 2025 Jul;15(7):1607-31.
7. Passeron T, King B, Seneschal J, Steinhoff M, Jabbari A, Ohyama M et al. Inhibition of T-cell activity in alopecia areata: recent developments and new directions. Frontiers in immunology. 2023 Nov 6;14:1243556.
8. Berger TG, Duvic M, Van Voorhees AS, Frieden IJ. The use of topical calcineurin inhibitors in dermatology: safety concerns: report of the American Academy of Dermatology Association Task Force. Journal of the American Academy of Dermatology. 2006 May 1;54(5):818-23.
9. Darchini-Maragheh E, Moussa A, Rees H, Jones L, Bokhari L, Sinclair R. Assessment of clinician-reported outcome measures for alopecia areata: a systematic scoping review. Clinical and Experimental Dermatology. 2025 Feb;50(2):267-78.
10. Mandel VD, Ardigò M. Non-invasive diagnostic techniques in dermatology. Journal of Clinical Medicine. 2023 Jan 30;12(3):1081.
11. Sonthalia S, Pasquali P, Agrawal M, Sharma P, Jha AK, Errichetti E et al. Dermoscopy update: Review of its extradiagnostic and expanding indications and future prospects. Dermatology practical & conceptual. 2019 Oct 31;9(4):253.
12. Errichetti E. Dermoscopy in monitoring and predicting therapeutic response in general dermatology (non-tumoral dermatoses): an up-to-date overview. Dermatology and therapy. 2020 Dec;10(6):1199-214.
13. Dodson J, Lio P. Dermoscopy: Past and present. Journal of Integrative Dermatology. 2023 Jan 25.
14. Bains P, Kaur S. The role of dermoscopy in severity assessment of alopecia areata: A tertiary care center study. The Journal of Clinical and Aesthetic Dermatology. 2020 Apr 1;13(4):45.
15. Raj C, Behera D, Behera D, Begum F, Choubey S. Dermoscopic Analysis of Patients with and without Poor Prognostic Indicators in Alopecia Areata–A Comparative Study. Indian Dermatology Online Journal. 2026 Jan 1;17(1):57-62.
16. Fatima R, Arif T, Shivakumar V. Clinical, dermoscopic and histopathological assessment in patients of alopecia areata: A hospital based cross-sectional study. Journal of Pakistan Association of Dermatologists. 2020 Sep 30;30(2):256-60.
17. Mahmoudi H, Salehi M, Moghadas S, Ghandi N, Teimourpour A, Daneshpazhooh M. Dermoscopic findings in 126 patients with alopecia areata: A cross-sectional study. International journal of trichology. 2018 May 1;10(3):118-23.
18. Sajjad D, Muzaffar B, Siddiqui MA, Hussain M, Aslam S, Farid H. Comparative Efficacy of Topical Tacrolimus 0.1% and Clobetasol Propionate 0.05% in the Treatment of Alopecia Areata (AA): Efficacy of Tacrolimus and Clobetasol Propionate in the Treatment of Alopecia Areata. Pakistan Journal of Health Sciences. 2023 Nov 30:77-80.
19. Ishaq M, Saleem S. Comparative efficacy of topical clobetasol propionate 0.05% ointment and topical tacrolimus 0.1% ointment in the treatment of alopecia areata. Pakistan Journal of Intensive Care Medicine. 2025 Jul 17;5(02):143-47.
20. Nassar A, Elradi M, Radwan M, Albalat W. Comparative evaluation of the efficacy of topical tacrolimus 0.03% and topical calcipotriol 0.005% mixed with betamethasone dipropionate versus topical clobetasol 0.05% in treatment of alopecia areata: A clinical and trichoscopic study. Journal of cosmetic dermatology. 2023 Apr;22(4):1297-303.
21. Mahmoudi H, Rostami A, Tavakolpour S, Nili A, Teimourpour A, Salehi Farid A et al. Oral isotretinoin combined with topical clobetasol 0.05% and tacrolimus 0.1% for the treatment of frontal fibrosing alopecia: a randomized controlled trial. Journal of Dermatological Treatment. 2022 Jan 2;33(1):284-90.
22. Brinks AL, Kearney CA, Needle CD, Pulavarty A, Spindler A, Maas D et al. Topical Tacrolimus, Clobetasol, and Minoxidil for Primary Cicatricial Alopecias: A Retrospective Analysis of Clinical Outcomes and Safety. Skin Appendage Disorders. 2026 Feb 22;12(1):55-9.
23. Fahim M, Khoso H, Khan J, Bakhtiar R. Comparative efficacy of topical calcipotriol and tacrolimus in alopecia areata: A prospective trial. Journal of Pakistan Association of Dermatologists. 2024 Jan 1;34(1).