A Comparative Study of the Therapeutic Effects of Intralesional Triamcinolone Acetonide and Platelet-Rich Plasma in Alopecia Areata at a Tertiary Health-Care Centre

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Abstract
Background: Alopecia areata (AA) is a chronic, immune-mediated, non-scarring hair-loss disorder arising from a collapse of follicular immune privilege. Intralesional corticosteroids and platelet-rich plasma (PRP) are both used for localized disease, but comparative long-term data remain limited.
Objective: To compare the efficacy, safety and relapse rates of intralesional triamcinolone acetonide (TAC) and PRP in patients with patchy AA.
Methods: In this prospective interventional study, 60 patients aged 18–50 years with scalp-limited AA were allocated by systematic randomization into two groups of 30. Group A received double-centrifugation PRP and Group B received TAC (5 mg/mL); injections were given at 4-week intervals for 12 weeks. Response was assessed using the Severity of Alopecia Tool (SALT) score at baseline, 4, 8 and 12 weeks, with adverse events and relapse monitored to 9 months. Data were analysed in SPSS v25.0 with $p < 0.05$ considered significant.
Results: Both groups improved progressively, but TAC produced significantly faster early reduction in SALT scores at 4, 8 and 12 weeks ($p = 0.03$, 0.04 and 0.05). Excellent improvement (>75%) at 12 weeks was seen in 46.7% of TAC versus 33.3% of PRP patients. At 9 months, mean SALT scores were comparable (6.8 ± 4.1 vs 6.1 ± 3.5; $p = 0.42$). Skin atrophy (20%) and hypopigmentation (13.3%) occurred only in the TAC group, and relapse was lower with PRP (10% vs 26.7%). Shorter disease duration, fewer patches and lower baseline SALT predicted better response.
Conclusion: TAC and PRP are both effective for patchy AA. TAC achieves faster early regrowth, whereas PRP offers comparable long-term efficacy with a superior safety profile and a lower relapse tendency, making it a useful steroid-sparing alternative.

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1. Introduction

Alopecia areata (AA) is a common, chronic, immune-mediated form of non-scarring hair loss characterized by the sudden appearance of well-circumscribed bald patches on the scalp or other hair-bearing areas. It affects individuals of all ages and both sexes and most commonly presents before the fourth decade of life [1, 2]. The condition arises from a collapse of the immune privilege of the anagen hair follicle, allowing autoreactive cytotoxic T lymphocytes to infiltrate the peribulbar region and disrupt

the hair cycle [3, 7].

Although AA is medically benign, its unpredictable course and visible cosmetic impact cause considerable psychological distress, particularly among young adults. Population-based studies estimate a lifetime risk of around 2%, with substantial geographic and demographic variation [4, 5, 6]. A wide range of therapies has been employed, broadly aimed either at suppressing perifollicular inflammation or at stimulating follicular regeneration [8, 9].

Intralesional triamcinolone acetonide (TAC) is regarded as a first-line option for limited patchy disease owing to its potent local anti-inflammatory action, but it carries a recognized risk of skin atrophy, hypopigmentation and telangiectasia. Platelet-rich plasma (PRP), an autologous concentrate of growth factors, has emerged as a regenerative alternative that may promote follicular neogenesis with a favourable safety profile [18, 20]. Direct comparative data, especially on long-term efficacy and relapse, remain limited. The present study was therefore undertaken to compare the therapeutic efficacy, safety and relapse rates of intralesional TAC and PRP in patients with patchy AA at a tertiary care centre.

2. Materials and Methods

2.1. Study Design and Setting

This prospective, interventional, comparative study was conducted in the Department of Dermatology, Venereology and Leprology of a tertiary care teaching hospital in Hapur, Uttar Pradesh, over a two-year period from March 2024 to February 2026, after obtaining institutional ethics committee approval and written informed consent from all participants.

2.2. Participants and Sample Size

Sixty clinically diagnosed patients with scalp-limited AA were enrolled. The minimum sample size derived from Jindal *et al*. using OpenEpi was 20 per group; to improve reliability, 30 patients were recruited in each arm. Eligible patients were aged 18–50 years, had disease confined to the scalp, and had received no AA treatment in the preceding three months. Pregnant or lactating women, patients with more than 50% scalp involvement, active local infection, or rapidly progressive disease were excluded.

2.3. Group Allocation and Intervention

Patients were allocated by systematic randomization (alternate assignment) to Group A (PRP) or Group B (TAC). PRP was prepared by a double-centrifugation technique: approximately 20 mL of antecubital venous blood was collected with 3.2% sodium citrate, centrifuged first at 1500 rpm for 15 minutes and then at 3000 rpm for 5–10 minutes, and the platelet-rich fraction was injected into the deep dermis using an insulin syringe (0.1 mL per site, 1 cm apart). Group B received intralesional TAC 5 mg/mL using an identical injection technique.

2.4. Treatment Protocol and Outcome Assessment

Injections were administered at 4-week intervals for a maximum of 12 weeks (three sessions) or until satisfactory regrowth; no other treatment was permitted. The primary outcome was the reduction in Severity of Alopecia Tool (SALT) score, calculated from weighted scalp regions (vertex 40%, right and left profiles 18% each, posterior 24%). Patients were assessed at baseline, 4, 8 and 12 weeks with serial digital photography, and were followed to 9 months for sustained response, adverse effects and relapse.

2.5. Statistical Analysis

Data were analysed using SPSS v25.0. Continuous variables were expressed as mean ± standard deviation and categorical variables as proportions. The Student t-test and chi-square test were used for comparison, Pearson correlation for associations, and a p-value < 0.05 was considered statistically significant.

3. Results

The two groups were well matched at baseline. The 21–30-year age band was most represented overall (35.0%), with a mild male predominance (58.3%). Most patients presented within six months of onset (43.3%) and with two to three patches (66.7%). Mean baseline SALT scores were comparable (PRP 20.4 ± 6.1; TAC 18.9 ± 5.7; p = 0.34), confirming similar disease severity at entry (Table 1).

Table 1: Baseline demographic and clinical characteristics of the study groups.

Characteristic	PRP (n=30)	TAC (n=30)	Total (n=60)
Age 21–30 years	12 (40.0%)	9 (30.0%)	21 (35.0%)
Age 31–40 years	8 (26.7%)	10 (33.3%)	18 (30.0%)
Male sex	16 (53.3%)	19 (63.3%)	35 (58.3%)
Duration < 6 months	14 (46.7%)	12 (40.0%)	26 (43.3%)
2–3 patches	21 (70.0%)	19 (63.3%)	40 (66.7%)
Mean baseline SALT ± SD	20.4 ± 6.1	18.9 ± 5.7	p = 0.34

Both groups showed progressive reduction in SALT scores. TAC produced significantly greater early improvement at 4, 8 and 12 weeks, but by 9 months the difference was no longer significant, indicating equivalent long-term efficacy (Table 2).

Table 2: Mean SALT scores (± SD) at successive follow-up intervals.

Follow-up	PRP (Mean ± SD)	TAC (Mean ± SD)	p-value
Baseline	20.4 ± 6.1	18.9 ± 5.7	0.34
4 weeks	16.1 ± 5.2	13.4 ± 4.6	0.03
8 weeks	11.8 ± 4.9	9.1 ± 4.2	0.04
12 weeks	7.3 ± 3.8	5.6 ± 3.3	0.05
9 months	6.1 ± 3.5	6.8 ± 4.1	0.42

At 12 weeks, excellent improvement (>75%) was more frequent with TAC (46.7%) than with PRP (33.3%), and complete regrowth was likewise higher with TAC (43.3% vs 30.0%); however, overall good-response rates (>50%) were statistically comparable (76.7% vs 73.3%; p = 0.77) (Table 3).

Table 3: Clinical response and hair-regrowth pattern at 12 weeks.

Outcome category	PRP (n=30)	TAC (n=30)
Excellent improvement (>75%)	10 (33.3%)	14 (46.7%)
Good improvement (50–75%)	12 (40.0%)	9 (30.0%)
Poor improvement (<50%)	8 (26.7%)	7 (23.3%)
Complete regrowth	9 (30.0%)	13 (43.3%)
Good response (>50%, overall)	22 (73.3%)	23 (76.7%)

Overall good response between groups: p = 0.77 (not significant).

Adverse effects were significantly more common in the TAC group (63.3% vs 33.3%; p = 0.03). Steroid-specific complications—skin atrophy and hypopigmentation—occurred exclusively with TAC, while PRP caused only mild, transient pain and erythema. Relapse at 9 months was lower with PRP (10.0% vs 26.7%) (Table 4).

Table 4: Adverse effects and 9-month relapse rates.

Event	PRP (n=30)	TAC (n=30)
Pain	8 (26.7%)	6 (20.0%)
Erythema	2 (6.7%)	3 (10.0%)
Skin atrophy	0 (0%)	6 (20.0%)
Hypopigmentation	0 (0%)	4 (13.3%)
Any adverse effect	10 (33.3%)	19 (63.3%)
Relapse at 9 months	3 (10.0%)	8 (26.7%)

Difference in any adverse effect between groups: p = 0.03 (significant).

Disease-related variables, rather than demographic factors, predicted outcome. Shorter disease duration (p = 0.03), single-patch disease (p = 0.04) and lower baseline SALT (≤20; p = 0.02) were each significantly associated with a good response. Correlation analysis confirmed moderate negative relationships between percentage improvement and baseline SALT (r = −0.44, p = 0.002), disease duration (r = −0.39, p = 0.004) and number of patches (r = −0.46, p = 0.001). Neither age (p = 0.94) nor sex (p = 0.98) significantly influenced response.

4. Discussion

In this comparative study, both intralesional TAC and PRP produced meaningful clinical improvement in patchy AA, but with distinct temporal and safety profiles. TAC achieved significantly faster early regrowth, consistent with its rapid anti-inflammatory action and with comparative reports by Kapoor *et al*., Jindal *et al*. and Khan *et al*. [10, 13, 17]. The young-adult predominance and mild male majority of our cohort mirror established epidemiological patterns [1, 2, 4].

Importantly, the early advantage of TAC did not translate into superior long-term efficacy. By nine months, mean SALT scores and overall good-response rates were statistically comparable between the two arms, echoing the long-term equivalence described in the meta-analysis by Meznerics *et al*. and in the comparative work of Balakrishnan *et al*. [11, 18]. PRP thus appears to achieve a slower but sustained regenerative effect.

The safety findings reinforce this distinction. Steroid-specific complications such as atrophy and hypopigmentation were confined to the TAC group, whereas PRP-related events were limited to mild local reactions—an observation aligned with the favourable safety profile reported by Bahri *et al*. and Ranpariya *et al*. [15, 20]. The lower relapse tendency observed with PRP suggests more durable disease control, plausibly mediated by platelet-derived growth factors promoting follicular neogenesis.

Prognostic analysis showed that disease burden, not demographics, governed response. Shorter duration, fewer patches and lower baseline severity each predicted better outcomes, supporting early intervention and concurring with Muhaidat *et al*., Ninama *et al*. and Su *et al*. [14, 16, 19]. The absence of an age or sex effect is consistent with prior comparative studies.

This single-centre study is limited by its modest sample size, systematic (rather than fully randomized) allocation and the absence of investigator blinding, and SALT scoring carries inherent observer variability. Larger, blinded, multicentre trials with longer follow-up—and evaluation of combination TAC–PRP regimens—are warranted to refine treatment selection.

5. Conclusion

Both intralesional TAC and PRP are effective treatments for patchy alopecia areata. TAC delivers faster initial regrowth, whereas PRP offers comparable long-term efficacy together with a significantly superior safety profile and a lower relapse tendency. PRP therefore represents a valuable steroid-sparing alternative, particularly for cosmetically sensitive sites, patients at risk of steroid-related complications, and those prone to relapse. Early presentation, limited patch number and lower baseline severity remain favourable prognostic indicators.

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References

1. Pratt CH, King LE Jr, Messenger AG, Christiano AM, Sundberg JP. Alopecia areata. Nat Rev Dis Primers. 2017;3:17011.
2. Wasserman D, Guzman-Sanchez DA, Scott K, McMichael A. Alopecia areata. Int J Dermatol. 2007;46(2):121-31.

3. Gilhar A, Etzioni A, Paus R. Alopecia areata. N Engl J Med. 2012;366(16):1515-25.
4. Darwin E, Hirt PA, Fertig R, Doliner B, Delcanto G, Jimenez JJ. Alopecia areata: review of epidemiology, clinical features, pathogenesis, and new treatment options. Int J Trichol. 2018;10(2):51-60.
5. Lee HH, Gwillim E, Patel KR, Hua T, Rastogi S, Ibler E, *et al*. Epidemiology of alopecia areata, ophiasis, totalis, and universalis: a systematic review and meta-analysis. J Am Acad Dermatol. 2020;82(3):675-82.
6. Jeon JJ, Jung SW, Kim YH, Parisi R, Lee JY, Kim MH, *et al*. Global, regional and national epidemiology of alopecia areata: a systematic review and modelling study. Br J Dermatol. 2024;191(3):325-35.
7. Rajabi F, Drake LA, Senna MM, Rezaei N. Alopecia areata: a review of disease pathogenesis. Br J Dermatol. 2018;179(5):1033-48.
8. Alkhalifah A. Topical and intralesional therapies for alopecia areata. Dermatol Ther. 2011;24(3):355-63.
9. Strazzulla LC, Wang EHC, Avila L, Lo Sicco K, Brinster N, Christiano AM, *et al*. Alopecia areata: an appraisal of new treatment approaches and overview of current therapies. J Am Acad Dermatol. 2018;78(1):15-24.
10. Kapoor P, Kumar S, Brar BK, Kukar N, Arora H, Brar SK. Comparative evaluation of therapeutic efficacy of intralesional triamcinolone acetonide versus intralesional autologous platelet-rich plasma injection in alopecia areata. J Cutan Aesthet Surg. 2020;13(2):103-11.
11. Balakrishnan A, Joy B, Thyvalappil A, Mathew P, Sreenivasan A, Sridharan R. A comparative study of therapeutic response to intralesional injections of platelet-rich plasma versus triamcinolone acetonide in alopecia areata. Indian Dermatol Online J. 2020;11(6):920-4.
12. Shumez H, Prasad PVS, Kaviarasan PK, Deepika R. Intralesional platelet-rich plasma vs intralesional triamcinolone in the treatment of alopecia areata: a comparative study. Int J Med Res Health Sci. 2015;4(1):118-22.
13. Jindal S, Jerajani H, Agrawal P. Intralesional platelet-rich plasma therapy versus intralesional triamcinolone acetonide for the treatment of alopecia areata. J Med Sci. 2018;5(2):68-75.
14. Ninama K, Mahajan R, Bilimoria F, Vaghani A. A clinical study on alopecia areata. Int J Res Dermatol. 2018;4(1):66-71.
15. Ranpariya RH, Gupta SB, Deora MS, Agrawal PV, Mathur R, Raheja A. Intralesional triamcinolone acetonide versus platelet-rich plasma: a comparative study in the treatment of alopecia areata of scalp. Int J Res Dermatol. 2019;5(3):521-7.
16. Muhaidat J, Al-Qarqaz F, Khader Y, Alshiyab D, Alkofahi H, Almalekh M. A retrospective comparative study of two concentrations of intralesional triamcinolone acetonide in the treatment of patchy alopecia areata on the scalp. Clin Cosmet Investig Dermatol. 2020;13:795-803.
17. Khan F, Hussain M, Khan B, Afsar S, Shafique M, Haq S, *et al*. Comparative study between intralesional injection of platelet-rich plasma and intralesional triamcinolone for the treatment of alopecia areata. J Ayub Med Coll Abbottabad. 2022;34(4):762-5.
18. Meznerics FA, Illes K, Dembrovszky F, Fehervari P, Kemeny LV, Kovacs KD, *et al*. Platelet-rich plasma in alopecia areata—a steroid-free treatment modality: a systematic review and meta-analysis of randomized clinical trials. Biomedicines. 2022;10(8):1829.
19. Su H, Chen Y, Chen Y. The optimal concentration of intralesional triamcinolone acetonide for patchy alopecia areata: a systematic review and meta-analysis. Dermatol Sin. 2022;40(2):85-93.
20. Bahri R, Maleki S, Shafiee A, Ghandi N, Abedini R, Ehsani A, *et al*. Efficacy and safety of platelet-rich plasma therapy in alopecia areata patients: a systematic review. Dermatol Ther. 2023;2023:8827644.

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