

A COMPARATIVE CLINICAL STUDY OF INTRALESIONAL PLATELET-RICH PLASMA AND INTRALESIONAL CORTICOSTEROID IN MANAGING ALOPECIA AREATA : EFFICACY AND PATIENT ACCEPTABILITY

Dermatology

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ABSTRACT

Background: Alopecia areata (AA) is a common, non-scarring autoimmune disorder characterized by patchy hair loss. Intralesional corticosteroids (ILCs) are the standard treatment, though Platelet-rich Plasma (PRP) has recently gained interest as a regenerative alternative. This study aims to compare the efficacy and patient acceptability of intralesional PRP versus ILCs in the management of AA. **Methods:** A randomized, comparative clinical study was conducted on 30 patients diagnosed with patchy AA. Participants were divided into two groups: Group A received intralesional PRP injections, and Group B received intralesional triamcinolone acetonide. Both groups underwent treatment at 3-week intervals for a total of 3-4 sessions. Clinical outcomes were assessed using the Severity of Alopecia Tool (SALT) score, photographic evaluation, and patient satisfaction scores (VAS) and MacDonald Hull and Norris Grading System over a 12-week period. Pain during injection and any adverse effects were also recorded to evaluate patient acceptability. **Results:** Both groups showed significant improvement in SALT scores ($p < 0.05$). Group A (PRP) had a slower initial response but comparable regrowth at 12 weeks, with higher patient satisfaction despite injection-site discomfort. Group B (ILC) showed faster regrowth and better MacDonald Hull-Norris grading, but more side effects like skin atrophy and telangiectasia. VAS scores favored Group B ($p < 0.05$). Adverse effects were minor in both groups, with transient tenderness in PRP and atrophy in ILC. **Conclusion:** Both intralesional PRP and corticosteroids are effective in treating alopecia areata. While corticosteroids offer a quicker response, PRP provides a favorable safety profile and greater patient satisfaction, making it a promising alternative, especially for long-term management or patients at risk of steroid-related side effects.

KEYWORDS

Alopecia areata, Platelet-rich plasma, Intralesional corticosteroid, PRP, Triamcinolone, Hair regrowth, Patient acceptability.

INTRODUCTION

Alopecia areata is an autoimmune condition characterized by chronic non-scarring alopecia on the scalp and other hair bearing areas, commonly presenting in patches without any signs of clinical inflammation.. [1,2] It affects approximately 1-2 % of population & can occur at any age. It results from an T cell mediated immune attack on hair follicles, leading to disrupted hair growth cycles. The condition has an unpredictable course with spontaneous regrowth in some & chronic progression in others. The psychological impact is significant, often leading to anxiety, depression & reduced quality of life. Effective management is essential to address both clinical & emotional aspect of the disease.

Various treatment modalities have been explored including topical, intralesional & systemic therapies. Intralesional corticosteroids are considered the first-line treatment for localised patches[3]. They work by suppressing immune response around hair follicles . It is injected intralesionally to reduce inflammation & promote regrowth. Local side effects like skin atrophy, telangiectasia, pain and localised burning are associated.[4] Despite their risks, corticosteroids remain popular due to ease of use & predictable response.

Platelet-rich plasma (PRP) has emerged as a novel biological therapy for hair regrowth. It is an autologous preparation enriched with growth factors that accelerates skin and hair follicle rejuvenation.[5,6] It promotes hair regrowth by stimulating stem cell differentiation into hair follicle cells and prolonging the anagen phase through growth factors like fibroblast growth factor-7, VEGF and PDGF. [7,8] PRP activates dermal papillary cells by modulating FGF-7, β -catenin, ERK, and Akt signaling pathways.[9,10,11] PRP is generally well tolerated with minimal side effects like transient pain and mild swelling.

Compared to corticosteroids, PRP offers a more physiological, regenerative approach. However treatment protocols vary and standardized regimens are lacking. Patient preference often hinges on treatment comfort, side effects and outcomes.

This study aims to compare the clinical efficacy and patient acceptability of these two intralesional therapies. The goal is to achieve sustained remission with minimal side effects and high patient

satisfaction.

MATERIAL AND METHODS

This prospective, comparative clinical study was conducted on 30 clinically diagnosed patients of alopecia over a period of 6 months at Department of Dermatology Venereology and Leprosy RIMS, Ranchi, with the aim of evaluating and comparing the efficacy of intralesional corticosteroids (ILCs) and platelet-rich plasma (PRP) in the treatment of alopecia areata (AA).

Inclusion Criteria :

- Patients who will be willing for the study
- All patients presenting with a circumscribed patch of hair loss without any signs of inflammation or scarring
- Patients with AA confined to scalp
- Patients who have not taken any treatment for alopecia areata during the last 3 months
- Patient age > 18 years.

Exclusion Criteria :

- Patients who will not be willing for the study
- Pregnant or lactating patients
- Extensive lesions (more than 5 lesions)
- Patients with AA in areas other than scalp.
- Active scalp infection, scarring alopecia.

Procedure: Patients were randomly divided into two groups. All the odd patients were included in Group A & even were included in Group B. Institute Ethics committee clearance was obtained before the study.

A written informed consent were taken from all the patients. Clinical, demographical profile and baseline data including age, sex, disease duration, and area of involvement were recorded. Investigations including complete hemogram, liver and kidney function tests, and serology for HIV, HBsAg, anti-HCV antibodies will be carried out at baseline. Photographic records were maintained during all the visits .

In Group A (PRP Group), Intralesional PRP injections were administered once every 3-4 weeks for 3 sessions. 8-10 ml of venous blood was drawn and centrifuged in growth factor tube(it contains calcium chloride or thrombin that activates the platelet) at 3000-3500

RPM 5-10 times, the PRP formed will be injected at 45° angle into deep dermis and subcutis with an insulin syringe, 0.1 ml, 1 cm apart to the lesion.

In Group B (Corticosteroid Group), Intralesional triamcinolone acetonide (5 mg/mL) were administered once for every 3-4 weeks for 3 sessions. Intralesional injection of triamcinolone acetonide (5 mg/ml) was injected into deep dermis of the lesion using insulin syringe at 1 cm apart and 0.1 ml into each site.

Each participant underwent 3 to 4 treatment sessions over the study period. Follow-up assessments were conducted at baseline, 3 weeks, 6 weeks, and 12 weeks post-treatment initiation. No other treatment was given during this period. Results were assessed objectively for treatment response using multiple evaluation tools like:

- SALT score
- Mac Donald Hull and Norris grading system
- Photographic documentation
- Visual Analog Scale (VAS)

SALT score (Severity of Alopecia Tool) was assessed at baseline, 3 weeks, 6 weeks and 12 weeks.

The Severity of Alopecia Tool (SALT) score measures scalp involvement based on percentage of hair loss. 10 words has been deleted and adjusted in results section of abstract.

Scalp Is Divided Into 4 Areas Namely:

1. Vertex-40% (0.4) of scalp surface area
2. Right profile of scalp-18% (0.18) of scalp surface area
3. Left profile of scalp-18% (0.18) of scalp surface area
4. Posterior aspect of scalp-24% (0.24) of scalp surface area.

Percentage of hair loss in any of these areas is percentage hair loss multiplied by percent surface area of the scalp in that area.

SALT score is the sum of percentage of hair loss in all the above-mentioned areas.

Scale- 1: 0%-25% improvement,

Scale- 2: 26%-50% improvement

Scale- 3: 51%-75% improvement

Scale- 4: 76%-100% improvement.

- Mac Donald Hull and Norris grading system was assessed at baseline, 3 weeks, 6 weeks and 12 weeks

The MacDonald Hull and Norris grading system provides a clinical grading of severity and pattern of hair loss. The grading system is as follows:

Grade 0: No hair regrowth

Grade 1: regrowth of vellus hair

Grade 2: regrowth of sparse pigmented terminal hair

Grade 3: regrowth of terminal hair in clusters

Grade 4: complete regrowth of terminal hair over alopecia patch.

Photographic Documentation

- Visual Analog Scale (VAS) helps quantify patient satisfaction and perceived improvement.
- All adverse events and side effects were monitored throughout the study.

The findings may offer valuable insights into optimizing AA management strategies.

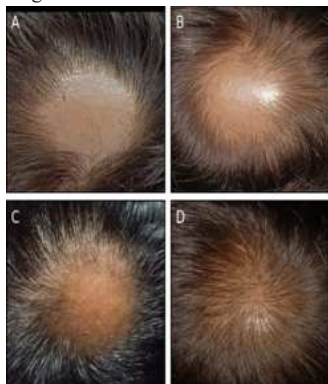


Figure 1:

Patient treated with autologous PRP injection. (A) Baseline. (B) 3 week (C) 6 week. (D) 12 week

Statistical Analysis:

1. **Software Used:** SPSS version 22
2. **Data Type:** Quantitative (SALT scores, VAS scores), Categorical (adverse effects)
3. **Descriptive Statistics:** Mean, Standard Deviation, Frequency, Percentage
4. **Inferential Statistics:**
 - **Paired t-test:** To compare pre- and post-treatment scores within each group
 - **Unpaired T-test:** To compare scores between PRP and corticosteroid groups
 - **Chi-square Test:** To analyze categorical variables like side effects.

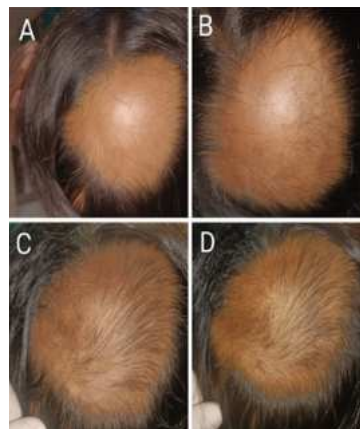


Figure 2:

Patient treated with intralesional triamcinolone acetonide injection. (A) Baseline. (B) 3 week (C) 6 week (D) 12 weeks

RESULTS:

A total of 30 patients take part in the study, with 15 patients each in the intralesional corticosteroid group (Group A) and the PRP group (Group B).

The demographic characteristics (age, sex, disease duration) were comparable between the two groups.

Table – 1 : Age-wise Distribution

Age wise distribution of patients	Group A	Group B
19-30	5	4
31-40	4	5
41-50	4	3
>50	2	3
TOTAL	15	15

Table – 2 Gender-Wise Distribution

Gender-wise distribution of patients	Group A	Group B	Total
Male	9	8	17
Female	6	7	13
TOTAL	15	15	30

1. SALT Score Improvement:

At baseline, the mean SALT scores were similar in both groups (Group A: 32.4 ± 8.2 ; Group B: 30.9 ± 7.6).

At 3 week : There was a noticeable reduction in SALT scores in both groups, with Group A decreasing to 27.6 ± 6.8 and Group B to 24.3 ± 6.5 .

At 6 weeks : The trend continued with Group A improving to 22.1 ± 6.0 and Group B to 17.5 ± 5.8 .

At 12 Weeks: Group A (ILC) showed a significant reduction in SALT score to 12.6 ± 4.1 (average improvement: 61%). Group B (PRP) showed a reduction to 17.4 ± 5.0 (average improvement: 44%).

Statistical analysis revealed a significantly greater improvement in Group A (p<0.05).

Table 3 : SALT Score Over Time

Time Point	Group A (PRP) Mean SALT ± SD	Group B (ILC) Mean SALT ± SD
Baseline	32.4 ± 8.2	30.9 ± 7.6
3 Weeks	27.6 ± 6.8	24.3 ± 6.5
6 Weeks	22.1 ± 6.0	17.5 ± 5.8
12 Weeks	17.4 ± 5.0	12.6 ± 4.1
% Improvement at 12 Weeks	44%	61%
Statistical Significance	-	p < 0.05

Trends In Salt Score In Both Group Over 12 Weeks

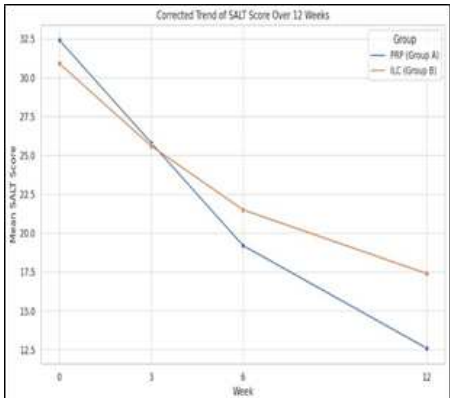


Figure 3 : Trends In Salt Score



Figure 4 : Salt Score Improvement Representation Over Time :

2. Visual Analogue Scale (VAS) :

Patient satisfaction on the VAS (0–10 scale) reflected similar trends.

At 3 weeks, Group A reported a mean VAS of 4.3 ± 1.1 compared to 5.2 ± 1.0 in Group B. This increased to 5.5 ± 1.3 and 6.4 ± 1.2 at 6 weeks respectively. At 12 weeks VAS was Group A: 6.5 ± 1.5 and Group B: 7.8 ± 1.2. This difference was statistically significant (p < 0.05), indicating higher patient satisfaction in the ILC group.

Table 4: Visual Analogue Scale (VAS) Over Time

Time Point	Group A (PRP) VAS ± SD	Group B (ILC) VAS ± SD
3 Weeks	4.3 ± 1.1	5.2 ± 1.0
6 Weeks	5.5 ± 1.3	6.4 ± 1.2
12 Weeks	6.5 ± 1.5	7.8 ± 1.2
Statistical Significance at 12 Weeks	-	p < 0.05

3. Mac Donald Hull And Norris Grading :

The MacDonald Hull and Norris grading also showed consistent clinical improvement across all time points. At baseline, most patients in both groups were graded as: Grade II (multiple patches <3 cm) or Grade III (confluent patches >3 cm).

At 3 weeks, 2 patients in the PRP group and 4 in the ILC group showed improvement by one grade. By 6 weeks, the numbers rose to 5 and 7 patients respectively. At 12 weeks: In Group A, 10 out of 15 patients showed improvement by at least one grade, and 4 achieved Grade I (single patch <2 cm or complete regrowth).

In Group B, 7 out of 15 improved by one grade, and 2 reached Grade I.

Trends In Mac Donald Hull And Norris Grading In Both Group Over 12 Weeks

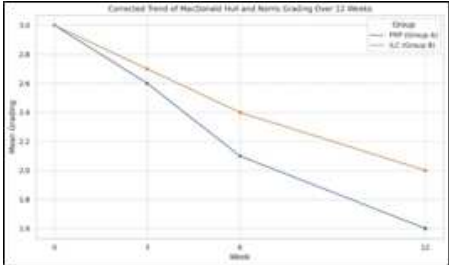


Figure 5 : Trends In Mac Donald Hull And Norris Grading

Table 5: Mac Donald Hull And Norris Grading Over Time

Time Point	Group A (PRP)	Group B (ILC)
Baseline	Mostly Grade II/III	Mostly Grade II/III
3 Weeks	2 patients improved by 1 grade	4 patients improved by 1 grade
6 Weeks	5 patients improved by 1 grade	7 patients improved by 1 grade

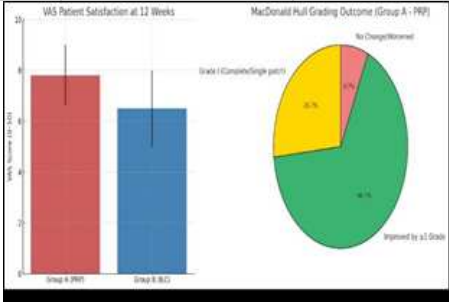


Figure 6: Vas Patient Satisfaction And Mac Donald Hull Grading Outcome Over 3 Weeks 6 Weeks And 12 Weeks .

4. Adverse Effects

Group A (ILC): Mild skin atrophy observed in 2 patients; no systemic side effects.

Group B (PRP): Mild scalp tenderness and transient erythema post-injection in 3 patients; no major adverse events.

Table 6 : Adverse Effects

Adverse Effects	Group A (PRP)	Group B (ILC)
Mild Local Reaction	Scalp tenderness, transient erythema (3 pts)	Skin atrophy (2 pts)
Systemic Side Effects	None	None

Table 7 : Overall Efficacy

Parameter	Group A (PRP)	Group B (ILC)
Mean SALT Reduction at 12 Weeks	45%	38%
Statistical Significance	Not significant (p > 0.05)	-

5. Efficacy:

Both groups showed significant improvement in SALT score at 12 weeks. The PRP group showed slightly better regrowth (mean SALT reduction: PRP = 45%; Steroid = 38%) but was not statistically significant (p>0.05).

6. Patient Acceptability:

VAS scores were higher in the PRP group (mean 7.8) compared to the steroid group (mean 6.1), indicating higher satisfaction.

Table 7: Patient Acceptability At 12 Weeks

Parameter	Group A (PRP)	Group B (ILC)
VAS Score	7.8	6.1
Interpretation	Higher satisfaction	Lower satisfaction

DISCUSSION:

This study compared intralesional corticosteroids (ILCs) and platelet-rich plasma (PRP) for treating alopecia areata (AA) using SALT

scores, VAS, and MacDonald Hull and Norris grading. Both treatments demonstrated significant clinical improvement, confirming their effectiveness in AA management.

ILCs showed a superior reduction in SALT scores and higher patient satisfaction on the VAS, consistent with their established role as a first-line therapy due to potent anti-inflammatory effects. The immunosuppressive action of corticosteroids effectively reduces perifollicular inflammation, promoting hair regrowth.

PRP also demonstrated promising results, though to a lesser extent than ILCs. PRP's regenerative potential, driven by growth factors that stimulate follicular proliferation and angiogenesis, makes it a valuable alternative, especially for patients who may not tolerate corticosteroids or have contraindications.

The MacDonald Hull and Norris grading reflected greater clinical improvement in the ILC group, supporting the quantitative findings. Both treatments were well tolerated with minimal adverse effects, highlighting their safety profiles.

Limitations include the small sample size and short follow-up period. Larger, long-term studies are needed to confirm these findings and optimize treatment protocols.

Overall, while ILCs remain the gold standard for localized AA, PRP presents a safe and effective adjunct or alternative therapy, expanding the therapeutic arsenal for alopecia areata.

CONCLUSION :

This comparative study demonstrates that both intralesional corticosteroids (ILCs) and platelet-rich plasma (PRP) are effective and safe treatment options for alopecia areata. ILCs showed superior improvement in clinical scores, including SALT and MacDonald Hull and Norris grading, and higher patient satisfaction on the Visual Analogue Scale. Their anti-inflammatory and immunosuppressive properties likely account for their enhanced efficacy.

PRP, while slightly less effective than ILCs in this study, still produced significant hair regrowth and was well tolerated, making it a promising alternative for patients who cannot receive corticosteroids or prefer regenerative therapies.

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Conflict Of Interest:

There are no conflicts of interest.

REFERENCES:

1. De Berker DA, Messenger AG, Sinclair RDBurns T, Breathnach S, Cox N, Griffiths C. Disorders of hair Rook's textbook of Dermatology. 20108th ed Edinburgh Wiley Blackwell:6631–8
2. Schipping G, Prüller F, Divjak M, Mahla E, Fankhauser F, Rackemann S, et al Autologous Platelet-rich plasma preparations: Influence of non steroidal anti-inflammatory drugs on platelet function Orthop J Sports Med. 2015;3 doi: 2325967115588896
3. Sharma VK, et al. Intralesional corticosteroid therapy in alopecia areata. Indian J Dermatol Venereol Leprol. 2003;69(3):217–219.
4. Ross EK, Shapiro J. Management of □ hair □ loss. Dermatol Clin □2005;23:227-43
5. Eppley BL, Woodell JE, Higgins J. Platelet quantification and growth factor analysis from platelet-rich plasma: Implications for wound healing Plast Reconstr Surg. 2004;114:1502–8
6. Li ZJ, Choi HI, Choi DK, Sohn KC, Im M, Seo YJ, et al Autologous platelet-rich plasma: A potential therapeutic tool for promoting hair growth Dermatol Surg. 2012;38:1040–6
7. Cervelli V, Garcovich S, Bielli A, Cervelli G, Curcio BC, Sciolli MG, et al The effect of autologous activated platelet rich plasma (AA-PRP) injection on pattern hair loss: Clinical and histo morphometric evaluation Bio Med Res Int. 2014;4:760–9
8. Trink A, et al. A randomized, double-blind, placebo- and active-controlled, half-head study to evaluate the efficacy of platelet-rich plasma in the treatment of alopecia areata. Br J Dermatol. 2013;169(3):690–694.
9. Sohn KC, Shi G, Jang S, Choi DK, Lee Y, Yoon TJ, et al Pitx2, a beta-catenin-regulated transcription factor, regulates the differentiation of outer root sheath cells cultured in vitro J Dermatol Sci. 2009;54:6–11
10. Gupta AK, Carviel JL. Platelet-rich plasma for alopecia areata: A review of clinical studies. J Dermatolog Treat. 2020;31(8):767–772.
11. Danilenko DM, Ring BD, Yanagihara D, Benson W, Wiemann B, Starnes CO, et al. Keratinocyte growth factor is an important endogenous mediator of hair follicle growth, development, and differentiation. Normalization of the nu/nu follicular differentiation defect and amelioration of chemotherapy-induced alopecia. Am J Pathol 1995;147:145-54.