

Efficacy of 5% Minoxidil Versus Platelet Rich Plasma in Treatment of Alopecia Areata

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ABSTRACT

Objective: To determine the efficacy of 5% Minoxidil versus Platelet Rich Plasma in treatment of alopecia areata.

Study Design: Quasi experimental study.

Place and Duration of Study: Department of Dermatology, Sheikh Zayed Hospital, Lahore, Pakistan, from Apr to Sep 2022.

Methodology: A total of 122 patients with alopecia areata, aged between 18-40 years and belonging to both genders, were enrolled after taking written, informed consent and were randomly and equally divided between two groups, of which, group A, received 5% Minoxidil, while group B, received intralesional Platelet Rich Plasma. Efficacy was assessed over 12 weeks in terms of improvement in Severity of Alopecia Tool (SALT) score.

Results: The mean age of the patients in group A was 25.1±6.1 years while in group B, it was 26.3±5.0 years. The mean SALT score at baseline was 74.3±7.8 versus 73.0±6.8 ($p=0.311$), while the mean SALT score at 12 weeks was 37.3±9.6 versus 33.6±8.7 ($p=0.029$) respectively. Comparison of efficacy of Minoxidil versus Platelet Rich Plasma revealed that Minoxidil was effective in 33 patients (54.1%), whereas, Platelet Rich Plasma was effective in 46 patients (75.4%), with this difference being statistically significant (p -value ≤ 0.05).

Conclusion: Platelet Rich Plasma was significantly more effective than Minoxidil in the treatment of patients presenting with alopecia areata.

Keywords: Alopecia, Efficacy, Minoxidil, Platelet Rich Plasma.

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INTRODUCTION

Alopecia is a term that refers to hair loss, occurring in patchy or widespread distribution, which may result in total baldness on the scalp,¹ often presenting among patients as a slow thinning of scalp hair due to hormonal or hereditary causes.² Alopecia areata (AA) is a non-inflammatory hair loss condition leading to patchy hair loss,² which can worsen and lead to full body or scalp baldness (alopecia totalis), or both, in extreme situations (alopecia universalis).² AA has a significant negative impact on patients' quality of life and self-esteem, especially those belonging to younger age group,³ As AA is thought to be an auto-immune illness, the majority of treatments are immunosuppressive, leading to difficulty in attaining full recovery.⁴ At present, systemic, topical and intralesional corticosteroids, immunotherapy, psoralen plus UVA light therapy, anthralin and other treatments are frequently prescribed with varying degrees of success⁵ with IL-17 inhibitors, IL-2 agonists, Platelet Rich Plasma (PRP) and Jak inhibitors being among the newer therapies under research.⁶ Topical

Minoxidil promotes differentiation above the dermal papilla and proliferation at the base of the hair bulb,⁷ while PRP is an autologous preparation of concentrated platelets in plasma which promotes the proliferation of cells within the dermal papilla by upregulating fibroblast growth factor.⁷⁻⁸ For hair restoration in these patients, more knowledge about the long-term implications of such treatment can have an impact on adherence and compliance,⁹ as some AA patients are not candidates for standard treatments and can be offered alternative approaches that, in addition to being effective, are more suitable for their needs with minimal side effects,¹⁰ As there is a lack of local data on comparison of conventional versus novel treatments of AA, therefore, this current study was planned with the aim to determine the efficacy of 5% Minoxidil versus PRP in treatment of AA, which will help in planning treatment strategies associated with fewer side effects and aid in reducing patients distress.

METHODOLOGY

This was a quasi-experimental study, which commenced at the Department of Dermatology, Sheikh Zayed Hospital, Lahore, Pakistan, from April to September 2022, after taking approval of the Ethics Review Committee via ERC letter number

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SZMC/170/2022. The sample size was calculated using the World Health Organization (WHO) sample size calculator, which came out to be 122 with 61 participants in each group. Non-probability consecutive sampling technique was used.

Inclusion Criteria: Patients with AA confined to scalp, between the ages of 18-40 years and belonging to both genders, with no history of any treatment over the last 3 months, presenting to outpatient department (OPD) were included in the study.

Exclusion Criteria: Patients with AA on areas other than scalp, those with active scalp inflammation, having 5 or more lesions and pregnant and lactating women, were excluded.

The diagnosis of AA was established clinically by the presence of patchy, circumscribed hair loss on the scalp without the presence of inflammation or scarring and features of active disease including exclamation point hairs, broken or dystrophic hairs, yellow dots and black dots on trichoscopy. Treatment efficacy was labeled if on follow up at 12 weeks after treatment, a grade of 4 or more was achieved on Severity of Alopecia Tool (SALT) score as per assessment of the dermatologist. Detailed history and physical examination of all patients was carried out and findings were noted down on a predesigned proforma, with a single dermatologist evaluating all patients. Severity of AA was also noted according to SALT score. Patients in group A were treated with topical Minoxidil 5% twice daily while patients in group B were treated with PRP injections every 4-weeks for 12 weeks. Patients were followed up at 4, 8 and 12 weeks. Digital camera serial images of the lesions were used for clinical evaluation and follow-up. At each follow-up, all patients were assessed by the same dermatologist. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Chi-square test was applied to compare the efficacy between groups and a *p*-value of ≤ 0.05 was considered as statistically significant.

RESULTS

We enrolled a total of 122 patients with mean age of the patients in group A being 25.1±6.1 years and 26.3±5.0 years in group B, while the mean duration of disease was 29.5±5.0 months versus 30.7±6.2 months and the mean SALT score at baseline was 74.3±7.8 versus 73.0±6.8 with a non-significant difference at the start of study (*p*=0.311). The mean SALT score at 12 weeks was 37.3±9.6 versus 33.6±8.7, with the difference between groups being statistically

significant (*p*=0.029) as shown in Table-I. Our participants included 34(55.7%) males and 27(44.3%) females in the Minoxidil group while the PRP group included 36(59.0%) males and 25(41.0%) females (*p*=0.714). The distribution of patients according to severity of AA is listed in Table-II with the distribution of patients according to grades of improvement was found to be statistically significant (*p*=0.039). Minoxidil was effective in 33(54.1%) patients, whereas PRP was effective in 46(75.4%) patients, and this difference between both groups was statistically significant (*p*=0.014) as shown in Table-III.

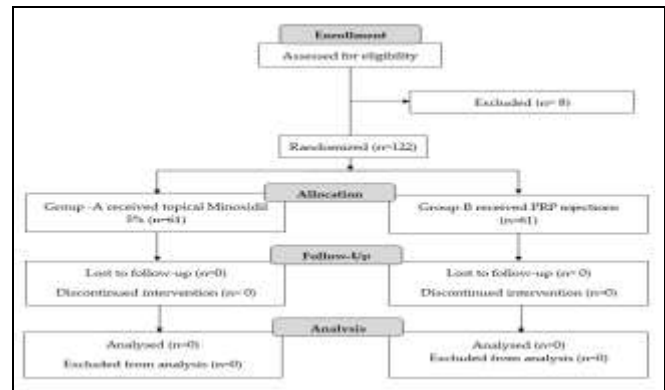


Figure: Patient Flow Diagram (n=122)

Table-I: Means of Quantitative Variables (n=122)

Variable	Group A (n=61) Mean±SD	Group B (n=61) Mean±SD	<i>p</i> -value (≤0.05)
Age (Years)	25.1±6.1	26.3±5.0	0.228
Duration of Disease (Months)	29.5±5.0	30.7±6.2	0.261
SALT Score at Baseline	74.3±7.8	73.0±6.8	0.311
SALT Score at 12 Weeks	37.3±9.6	33.6±8.7	0.029

Table-II: Frequency of Qualitative Variables (n=122)

Variable	Variable Groups	Group A (n=61) n (%)	Group B (n=61) n (%)	<i>p</i> -value (≤0.05)
Severity of AA	Severe	51(83.6%)	54(88.5%)	0.433
	Very severe	10(16.4%)	7(11.5%)	
Improvement at 12 weeks in SALT score	Grade II	2(3.3%)	1(1.6%)	0.039
	Grade III	36(59.0%)	23(37.7%)	
	Grade IV	23(37.7%)	37(60.6%)	

Table-III: Comparison of Efficacy Between Both Groups (n=122)

Efficacy	Group A (n=61)	Group B (n=61)	p-value (≤ 0.05)
Yes	33(54.1%)	46 (75.4%)	0.014
No	28(45.9%)	15 (24.6%)	

DISCUSSION

The current study results revealed that in patients with AA, PRP was more efficacious compared to Minoxidil in terms of improvement in the SALT score, and this difference was statistically significant ($p=0.014$). Majority of the patients in our study were males and were less than 30 years in age. While hair loss caused by AA can affect the scalp, beard, body, eyebrows, or eyelashes without leaving scars,¹¹ it can also be limited, complete, or all-encompassing with trichoscopic findings showing yellow dots, dystrophic hair, black dots, exclamation mark hair, and sprouting hairs along with short vellus hair.¹² As the primary goals of current hair loss treatment plans are to encourage cellular proliferation and differentiation throughout the hair development cycle,¹³ Minoxidil would be beneficial and lengthen hair follicles,¹⁴ however, dermal papilla cells have been shown to proliferate when activated autologous PRP is applied,¹⁵ by increasing FGF-7 as one of the crucial elements for active hair development has been identified as anagen-associated angiogenesis.¹⁶ PRP and Minoxidil have been evaluated for the treatment of AA in one study,¹⁷ which revealed that when compared to patients with more severe hair loss, Minoxidil and PRP treatments produced the highest hair growth rates in patients with patchy AA. In another comparison of PRP and Minoxidil, PRP treated patients had earlier hair regrowth and considerably fewer yellow spots than Minoxidil treated individuals.¹⁷ Our study revealed that both PRP and Minoxidil had high rates of efficacy, however, there was no statistically significant difference. One author reported that AA is distinguished by a sizable inflammatory infiltrate and PRP's anti-inflammatory properties helped to reduce it.¹⁸ Using microscopic analysis, another study noted an increase in epidermal thickness and the quantity of hair follicles within two weeks after the final PRP treatment as compared to the initial thickness.¹⁹ While this study does suggest that PRP and Minoxidil are both promising therapies for AA, however, research

has shown that the advantages of Minoxidil are short-lived and may not affect hair growth when used for less than six months.¹⁹ Cost, availability, and time should also be considered while choosing between these two treatments.²⁰

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LIMITATIONS OF STUDY

This study has several limitations. First, as it was conducted at a single center, the findings may not be generalizable to broader populations. Second, the analysis did not evaluate the cost-effectiveness of the treatment. Finally, the study did not include long-term follow-up of patients, limiting insights into the durability of the observed outcomes. Future studies must be carried out on a large sample size and must incorporate comparison with other treatment options as well in order to validate the findings of current study.

CONCLUSION

We found that PRP was more effective than Minoxidil and this effect was statistically significant. However, cost, availability, and time should also be taken into account while choosing between these two treatments in addition to effectiveness.

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Authors' Contribution

The following authors have made substantial contributions to the manuscript as under:

SIG & SA: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

BJB & BR: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

TA & RN: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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