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COMPARATIVE STUDY BETWEEN EFFICACY OF MINOXIDIL (5%) AND PLATELET RICH PLASMA IN THE TREATMENT OF ANDROGENETIC ALOPECIA IN MALES

Dermatology

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ABSTRACT

Androgenetic alopecia (AGA) is a common form of hair loss affecting men, characterized by progressive miniaturization of hair follicles. Platelet-rich plasma (PRP) and topical Minoxidil 5% are widely used treatment modalities, but their comparative efficacy remains a topic of investigation. This study aims to evaluate and compare the effectiveness of PRP therapy and Minoxidil 5% in treating AGA. This prospective study included 28 male patients diagnosed with AGA, divided equally into two groups: Group-P (PRP therapy) and Group-M (Minoxidil 5%). Baseline demographic characteristics, family history, and clinical parameters such as age of onset, Norwood-Hamilton classification, hair density, hair thickness, and hair pull test results were recorded. PRP was prepared and injected in Group-P, while Group-M applied Minoxidil 5% twice daily. Patients were followed up at baseline, 3 months, and 6 months, and outcomes were assessed using hair density, hair thickness, hair pull test, bald spot reduction, hair growth response, effectiveness in slowing hair loss, and overall patient satisfaction. At 6 months, Group-P demonstrated significant improvement in hair density (120.47 ± 6.34 hairs/cm²) and hair thickness (53.88 ± 4.26 µm) compared to Group-M (105.53 ± 5.95 hairs/cm², 46.33 ± 4.17 µm, $p < 0.0001$). PRP therapy showed a better response in bald spot reduction and hair growth, with 35.7% of PRP patients rating it as very effective versus 14.3% in the Minoxidil group. Patient satisfaction was significantly higher in Group-P, particularly for top-of-head coverage ($p = 0.0493$).

KEYWORDS

Androgenetic alopecia, PRP, Minoxidil

INTRODUCTION

Androgenetic alopecia (AGA) is a common hair loss disorder characterized by a receding frontal hairline in men and diffuse thinning in women. It is primarily driven by dihy- drotestosterone (DHT) and 5-alpha-reductase activity, which shorten hair growth cycles and miniaturize follicles [10]. Given its impact on self-esteem and appearance, AGA significantly affects quality of life [2]. Given the increasing prevalence of AGA and its im- pact on individuals, this study aims to assess and compare two treatments—Platelet-Rich Plasma (PRP) and Minoxidil 5%—to determine their effectiveness, providing evidence- based guidance for dermatologists and patients seeking optimal management strategies.

MATERIALS AND METHODS

Study Population: Male patients diagnosed with androgenetic alopecia attending the Outpatient Depart- ment (OPD) of the Dermatology Department at Dr. KNS Memorial Institute of Medical Sciences, Barabanki, Uttar Pradesh.

Study Design: This is Prospective study with simple random sampling of 28 patients (14 in each group) for a duration of 18 month

Subjects Were Randomly Allocated Into Two Groups:

- **Group-M:** 14 patients applied Minoxidil 5% twice daily.
- **Group-P:** 14 patients received intradermal PRP injections at 0, 1, and 2 months.

Parameters such as hair density, hair thickness, bald spot reduction, and patient satis- faction were measured at baseline, 3 months, and 6 months.

Statistical Analysis:

Data was entered in Microsoft Excel and analyzed using SPSS version 26 (SPSS Inc., Chicago, IL, USA). Continuous variables were evaluated by mean (standard deviation). Dichotomous variables were presented in number/frequency and analyzed using Chi- square and Fisher's exact tests. A p-value of < 0.05 or < 0.001 was considered significant.

RESULTS:

At 6 months, Group-P (PRP) demonstrated significant improvement in hair density (120.47 ± 6.34 hairs/cm²) and hair thickness (53.88 ± 4.26 µm) compared to Group- M (Minoxidil 5%) (105.53 ± 5.95 hairs/cm², 46.33 ± 4.17 µm, $p < 0.0001$). PRP therapy showed a better response in bald spot reduction and hair growth, with 35.7% of PRP patients rating it as very effective versus 14.3% in the Minoxidil group. Patient satisfaction was significantly higher in Group-P, particularly for top-of-head coverage ($p = 0.0493$). The mean satisfaction score in Group-P was 6.93 ± 1.36, while in Group-M, it was 5.25 ± 1.61 ($p = 0.0061$).

Table 1: Demographic Characteristics Of Enrolled Patients

Variable		GROUP-P [n=14]	GROUP-M [n=14]	P-Value
Age (mean ± SD)		26.16 ± 3.51	25.82 ± 4.23	t=0.2314 p=0.8188
BMI (mean ± SD)		23.72 ± 1.87	24.14 ± 2.05	t=0.5663 p=0.5760
Family History of AGA	Yes	8 (57.1%)	7 (50.0%)	X=0.1436 p=0.7047
	No	6 (42.9%)	7 (50.0%)	
Age of onset of AGA (mean±SD)		21.54 ± 1.62	21.36 ± 2.94	t=0.2006 p=0.8425

Table 2: Grade Of Aga (Norwood-Hamilton Classification) At Baseline

Grade	GROUP-P [n=14]	GROUP-M [n=14]	P-Value
I	0 (0%)	0 (0%)	X=2.091 p=0.5538
II	5 (35.7%)	6 (42.9%)	
III	3 (21.4%)	1 (7.1%)	
IIIA	6 (42.9%)	6 (42.9%)	
IV	0 (0%)	1 (7.1%)	

Table 3: Hair Growth Response In The Enrolled Patients Among The Groups

Response	GROUP-P [n=14]	GROUP-M [n=14]	P-value
Greatly increased	2 (14.3%)	1 (7.1%)	X=4.626 p=0.2014
Moderately increased	7 (50.0%)	3 (21.4%)	
Slightly increased	5 (35.7%)	8 (57.1%)	
No change	0 (0%)	2 (14.3%)	

Table 4: Effectiveness In Slowing Hair Loss Among The Groups

Response	GROUP-P [n=14]	GROUP-M [n=14]	P-value
Very effective	5 (35.7%)	2 (14.3%)	X=4.019 p=0.1341
Somewhat effective	8 (57.1%)	7 (50.0%)	
Not very effective	1 (7.1%)	5 (35.7%)	

Table 5: Overall Hair Satisfaction In Enrolled Patients Among The Groups

Response	GROUP-P [n=14]	GROUP-M [n=14]	P-Value
Very satisfied	1 (7.1%)	0 (0%)	X=2.844 p=0.4163
Satisfied	8 (57.1%)	5 (35.7%)	
Neutral	4 (28.6%)	7 (50.0%)	
Dissatisfied	1 (7.1%)	2 (14.3%)	

Table 6: Patient Satisfaction Among The Enrolled Groups

Patient Satisfaction Score	GROUP-P [n=14]	GROUP-M [n=14]	P-Value
Mean Score ± SD	6.93 ± 1.36	5.25 ± 1.61	t=2.983 **p=0.0061***

DISCUSSION

Our study confirms that a greater percentage of participants in Group-P (PRP) reported success in decreasing hair loss compared to Group-M (Minoxidil 5%). Although the p- value (0.183) showed no significant difference in slowing hair loss, these results align with a study by Verma K. et al. [1], where 37.5% of patients in the PRP group felt the therapy was extremely successful in decreasing hair loss, compared to 14.2% in the Minoxidil group. The higher platelet count in PRP and its ability to promote hair follicle regeneration may explain the better outcomes observed in this group. The sample size in both groups was relatively small (n=14), which may limit the generalizability of the findings. The study duration of six months may not be sufficient to assess long-term effects, and external factors such as diet, lifestyle, or concurrent medications were not accounted for.

CONCLUSION

The comparative study highlights the superior efficacy of PRP in terms of hair density, thickness, and overall patient satisfaction compared to Minoxidil 5%. PRP's ability to promote hair follicle regeneration may explain these outcomes. While Minoxidil showed moderate effectiveness, PRP emerged as a more promising therapy for AGA, making it a preferable option for individuals seeking noticeable and lasting results. Further large- scale, long-term studies are recommended to validate these findings.

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