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Research Article

COMPARITIVE STUDY OF TOPICAL MINOXIDIL (5%) PLUS FINASTERIDE (0.1%) VERSUS PLATELET-RICH PLASMA PLUS TOPICAL MINOXIDIL (5%) PLUS FINASTERIDE (0.1%) IN PATIENTS WITH ANDROGENIC ALOPECIA

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ABSTRACT

Objective: Androgenic alopecia is progressive loss of terminal hairs in patterned distribution. It causes psychoemotional problems and affects the quality of life. Therefore, to achieve optimal results, multiple modalities are required. In this study, the combination of platelet-rich plasma (PRP) along with topical drugs such as minoxidil and finasteride is compared with the conventional combination of topical minoxidil (5%)+Finasteride (0.1%)

Methods: A prospective randomized study was conducted on a total of 50 males with androgenetic alopecia (AGA) at the Department of Dermatology, Parul Institute of Medical Sciences and Research for 1 year. A total of 50 males diagnosed with AGA were divided into two groups randomly. Patients in in Group A were recommended topical minoxidil (5%)+finasteride (0.1%), and Group B was treated with PRP along with topical minoxidil (5%)+finasteride (0.1%). PRP was done every month for 6 months and minoxidil applied over scalp twice daily for 6 months. Both groups were followed up monthly for 6 months and then after 6 months of last visit. Hair density was assessed using the Hamilton–Norwood scale using photographs and patient's self-assessment scores. Data were evaluated applying Chi-square test.

Results: After 6 months of the last visit subjective response with minoxidil (5%) +finasteride (0.1%) showed good response in 26%, moderate in 39%, and poor in 35%, whereas PRP+minoxidil (5%)+finasteride (0.1%) group showed good response in 65%, 26% responded moderately and 9% responded poorly.

Conclusion: The combination therapy of PRP and topical minoxidil+finasteride being safe and effective can be used for patients unresponsive to conventional therapy and for faster outcome.

Keywords: Platelet rich plasma, Androgenic alopecia, Minoxidil, Finasteride, Subjective response.

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INTRODUCTION

The appearance of hair plays an important role in symbolizing ageing of a person. It has been associated with youth and beauty in women and masculinity in men. Androgenic alopecia is a progressive miniaturization and thinning of hair follicles, with conversion of terminal hair into vellus hair. Many genetic and environmental factors affect the disease.

Medical and surgical treatments such as minoxidil, finasteride, and hair transplantation surgery are available. Among them, only topical minoxidil and oral finasteride are Food and Drug Administration approved treatment. The changes with these modalities may not always be effective; they might be slow, expensive, require long-term compliance, and may be associated with unacceptable adverse effects [1].

Platelet-rich plasma (PRP) contains growth factors and cytokines, which are proven effective in hair growth. These growth factors include platelet-derived growth factor, transforming growth factor, vascular endothelial growth factor, and epithelial growth factor. Since regeneration of hair growth of PRP depends on the levels of growth factors which are released on activation; hence, it has emerged as an effective and safe way to treat androgenetic alopecia (AGA) [2].

Combination therapy with topical minoxidil plus topical finasteride plus PRP provides a promising, effective, and safe modality for the treatment of AGA.

METHODS

Study design

It was an interventional comparative study conducted in the outpatient Department of Dermatology of Parul Institute of Medical Sciences and Research over a period of 1 year from March 2023 to March 2024. Ethical approval for the study was obtained.

Sample size

The sample size was calculated at 95% confidence interval assuming 70% or more efficacy for each procedure and 20% relative allowable error was taken. The sample size was calculated using the formula for sample size for estimation of proportion:

$$2N=Z^2_{1-\alpha/2}\, P\,(1-P)/E^2$$

α=standard normal deviate for 95% confidence interval (taken as 1.96), p=expected efficacy of each procedure (assumed to be 70%), E=relative error that can occur (20% of p). The sample size was calculated to be 43 subjects. Considering 10% attrition, sample size was equalized to 50 subjects.

Inclusion criteria

All male patients aged 18–60 years presenting with grade 2–5, as per Hamilton–Norwood scale, and patient not taking any treatment for 6 months.

Exclusion criteria

Patients with alopecia other than AGA, application of topical lotions like minoxidil, finasteride during the last 6 months, systemic disorders

like hypertension and diabetes, any history of bleeding diathesis, erythema or swelling over the scalp, history of malignancy or any immunocompromised patients were excluded [3].

Methodology

A detailed medical history was recorded for each patient including duration of hair fall, history of intake of any medications, any systemic disorder, and family history to exclude other causes. Smoking history was taken in account since it can aggravate AGA. A complete clinical examination was done and diagnosis of AGA was made. Patients were investigated for HIV, Hbsag, and Platelet count. Grading of AGA was based on the Hamilton Norwood scale as one in Table 2 and baseline clinical photography.

PRP preparation

Under aseptic precautions, 18 mL of whole blood was obtained from the median cubital vein mixed with 2 mL sodium citrate solution into a Falcon tube. 1st spin 1500/min for 10 min was done and separated into three layers, red blood cell layer, buffy coat layer and platelet-poor plasma (PPP) form bottom to top consecutively. Buffy coat was collected and spinned at 3500/min for 10 min. PPP was discarded and PRP was filled in insulin syringes.

Group B patients were injected with PRP by an intradermal technique (multiple insulin injections in a linear pattern 1 cm apart) under proper aseptic precautions in the scalp at a monthly interval of 6 months. Group A and Group B patients both were told to apply 1 mL of topical 5% minoxidil plus (0.1% finasteride) solution twice a day on both sides and were followed up similarly.

Improvement was assessed by the serial hair pull test [4], global photography as shown in Figs. 1 and 2 [5], and hair density. Subjective improvements of patients were noted on a dermatology life quality index (DLQI) scale.

Questionnaire	Score
Bald spot getting smaller	1
Increase in hair count	1
Improvement in appearance of hair	1
Overall improvement in hair after Therapy	1
Decrease shedding of hair	1

Response was graded by patients as follow:

Response	Score
Good	>4
Moderate	2–3
Poor	<2

Statistical analysis

Was done using Statistical Packages for the Social Sciences software, categorical data were presented as numbers and were compared using the χ^2 test.

RESULTS

There was no significant difference among the patient's groups at baseline with respect to the age of the patients, the age onset of alopecia, grade of hair loss, and family history.

A total of 50 male patients were enrolled, and the most common age group was 20–30 year-age group. In the case of family history, out of 50 patients, 46% (n=23) of the patients had a positive family history of AGA and 54 % (n=27) had no family history as shown in Table 1.

The most common morphological type in our study was Norwood-Hamilton Grade II (38% [n=19]), followed by Grades IV, III, and V having 36% (n=18), 22% (n=11), and 4% (n=2) of the patients, respectively.

According to post-procedure subjective response as per DLQI of the last visit 43% (n=10) of patients receiving minoxidil showed Good response, moderate in 22% (n=5), and poor in 35% (n=8), whereas in the PRP+minoxidil 5% +Finasteride 0.1% side, 56% (n=13) of the patients responded Good, 30% (n=7) responded moderately, and 13% (n=3) responded poorly (Table 3). Subjective response score as per DLQI after 6 months of follow-up was increased in Group B to Good in 83% (n=19), moderate 13% (n=3), and poor 4% (n=1) (Table 4). Hence, a significant result ($p<0.05$) was found.

The mean change in DLQI from the first to the last visit, we found a significant ($p<0.05$) decline in DLQI in both sides. In the minoxidil 5% side, the DLQI reduced from a mean value of 16.64±2.3 before treatment to 4.80±4.0 after treatment; in the PRP +minoxidil 5% +finasteride (0.1%) side, decreased from value of 16.64±2.23 to 3.0±3.6, thus suggesting that minoxidil 5+finasteride (0.1%) %+PRP had better DLQI response.

Hair pull test was done at the beginning of treatment and then at the end of 6 months. Results shown as per Table 5. Seventeen patients in Group A (74%) had a negative hair pull test as compared to 19 patients in Group B (84%); however, p-value was not significant.

Out of 25 patients, two patients opted out from the study due to side effects with topical minoxidil such as erythema and scaling.

DISCUSSION

AGA is one of the most common causes of hair loss observed in our practice. Due to the limited treatment options available, many newer treatment options are still being sought for AGA, among them PRP therapy has shown promising results in the recent past.

Table 1: Demographic correlation

Demographic profile	Group A	Group B
No. of patients	25	25
Age (mean age)	28.6±4.89 SD	27.9±4.89 SD
Age (mean age) of onset of AGA	21.6	21.9
Family history of AGA	13	10

SD: Standard deviation, AGA: Androgenetic alopecia

Table 2: Modified Norwood Hamilton's scale

Grade	Group A (topical minoxidil+finasteride)	Group B (topical minoxidil+finasteride+prp)
I	0	0
II	9	10
III	6	5
IV	10	8
V	0	2
Total	25	25

Table 3: Post-procedure subjective response after last visit

Response	Group A (n=23) (%)	Group B (n=23) (%)
Good	10 (43)	13 (56)
Moderate	5 (22)	7 (30)
Poor	8 (35)	3 (13)

Table 4: Post-procedure subjective response after 6 months of last visit

Response	Group A (n=23) (%)	Group B (n=23) (%)
Good	6 (26) (1.93)	15 (65) (1.93)
Moderate	9 (39) (0.30)	6 (26) (0.30)
Poor	8 (35) (1.80)	2 (9) (1.80)

Table 5: Hair pull test

Result	Group A (%)	Group B (%)
Negative	17 (74)	19 (82)
Positive	6 (26)	4 (18)

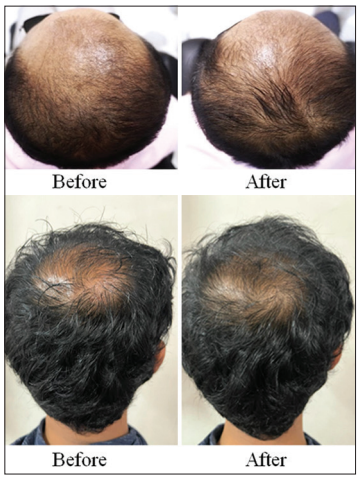

Fig. 1: Group A

Although many studies have been done in the past demonstrating the efficacy of minoxidil plus topical finasteride therapy and PRP therapy independently, there has not been much literature about the comparison of the combination of these two forms of therapies. Hence, in this study, we compared the established minoxidil plus finasteride therapy with relatively newer PRP therapy along with minoxidil plus finasteride topically. This could help us to conclude that there is a safer, convenient, and efficient form of therapy in the treatment of AGA.

Mean age of onset is between 20 and 25 years in majority of the patients with AGA. A family history was positive in 50% and 42% of the patients of AGA, respectively, in Group A and Group B. Serial negative hair pull tests were done every month and clinical photographs showed promising results after 6 months of follow-up from the last treatment and the response in terms of photographs was faster in Group B.

PRP preparation was done using standardized parameters in our study which generated good platelet concentration. Considering the previous literature on the success of PRP in hair growth in Grades II and III of AGA, the choice of subjects in this study was made accordingly [6]. As per the literature, the required number and frequency of injections of PRP were taken into consideration accordingly, where 3 months time was of maximal benefit [7]. The outcome assessments comprised objective-based, subjective-based as well as quantitative parameters.

In this study both the group showed results that were well tolerated and promising but Group B showed faster results as compared to Group A; hence, compliance was better due to faster results.

Various studies done showing similar results to our study are as follow,

We observed a similar decrease of hair loss as in study conducted by Maria-Angeliki *et al*. [8] 5 sessions done at 12 days interval with injections showed clinical examination digital images hair pull test, patient's satisfaction. All patients after the third treatment were observed to have a negative hair pull test and a 25% decrease of hair loss and patients' satisfaction: 7.0 on a scale of 1–10.

Group study was conducted by Gentile *et al*. [9] of 20 male patients with male pattern hair loss Stages II-IV of the Norwood–Hamilton classification. After three treatments at an interval of 1 month, patients showed an improvement in mean hair count and total hair

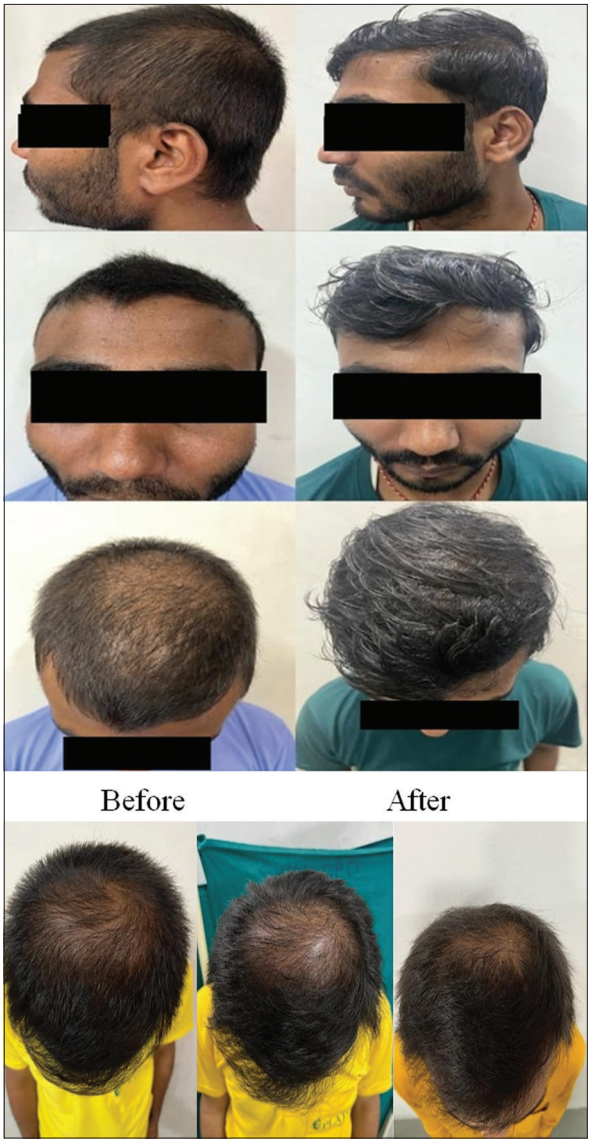

Fig. 2: Group B

density compared to those who received placebo. We observed similar improvement in our study.

Study done by Krupa Shankar *et al.* [10], 27.27% of patients presenting with Grade II alopecia, 22.12% of patients presenting with Grade I alopecia, 21.78% of patients, with Grade III alopecia, 10.8% of patients with Grade IV alopecia, and 6% with Grade V alopecia. In our study, about 36% and 24% of patients presented with Grade II and Grade III of Norwood–Hamilton scale at the baseline.

The side effects of PRP are usually mild and the most common side effect that has been reported is pain; hence. it is rarely a reason for discontinuation of therapy. The technique used is subdermal injection for PRP which is associated with less pain and is considerable for future use. However, the proportion of those who reported adverse effects due to therapy in the study does not include those who lost to follow-up due to therapy dissatisfaction.

CONCLUSION

Both forms of therapies are equally effective in improving hair growth and density in AGA. However, PRP therapy along with topical minoxidil and finasteride has an early improvement in hair regrowth and therefore has a slight advantage over minoxidil + finasteride lotion.

Therefore, the combination can not only improve hair growth and hair density but also reduces progression of hair fall overtime proving to be a promising treatment.

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AUTHOR'S CONTRIBUTION

Dhara Patel – Introduction, Discussion, Conclusion, Spandan Shah – Abstract formulation, Krunal Tralsawala – Table formulation, Som Lakhani – Overall supervision.

CONFLICTS OF INTEREST

None.

AUTHOR SOURCE OF FUNDING

Nil.

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