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EFFICACY OF AUTOLOGOUS PLATELET RICH PLASMA THERAPY VERSUS TOPICAL MINOXIDIL AND PRP IN MEN WITH MODERATE ANDROGENETIC ALOPECIA

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Abstract

Background: *Androgenetic alopecia (AGA) is a common androgen-dependent hair loss disorder in men, often managed with topical minoxidil or oral finasteride. Autologous platelet-rich plasma (PRP) has emerged as an adjunct therapy. This study evaluated the efficacy of PRP alone versus PRP combined with topical minoxidil in moderate AGA.* ***Methods:*** *We conducted a cross-sectional study in a tertiary care center (Abbotabad) from November 2024 to March 2025. A total of 180 males (age 20–50) with moderate AGA (Hamilton-Norwood grade III–V) were divided into three equal groups (n=60 each): Group A – PRP injections monthly; Group B – 5% minoxidil topical solution twice daily; Group C – combination of PRP + 5% minoxidil. Efficacy was assessed at 6 months by hair density (trichoscopy), hair diameter, hair pull test, patient satisfaction and adverse events.* ***Results:*** *All groups showed significant improvement from baseline. The combination group achieved the greatest increase in hair density (mean +24.8 hairs/cm; p<0.001). PRP-alone and minoxidil-alone groups had comparable hair density gains (+14.2 vs +11.6 hairs/cm; p=0.18). Hair shaft diameter improved similarly with PRP (+12.4 µm) and minoxidil (+10.7 µm), but more with combination therapy (+18.9 µm). The combination therapy yielded a higher rate of negative hair pull tests (93%) compared to PRP (88%) and minoxidil (72%). Patient satisfaction was highest in the combination group. No serious adverse effects occurred; transient injection-site pain was more frequent in PRP-treated patients.* ***Conclusion:*** *In men with moderate AGA, PRP monotherapy is as effective as topical minoxidil. The addition of topical minoxidil to PRP significantly improves hair regrowth outcomes, indicating synergistic effect. PRP therapy was well-tolerated, suggesting it as a viable adjunct to standard AGA treatment.*

INTRODUCTION

Androgenetic alopecia is the most common form of hair loss in men, affecting up to 50% of men by the age of 50. It is characterized by progressive miniaturization of scalp hair follicles in a defined pattern, leading to thinning over the vertex and frontal scalp [1]. AGA can significantly impact

quality of life, causing low self-esteem, anxiety and depression in affected individuals [2]. Topical minoxidil (5% solution for men) promotes hair growth by shortening the telogen phase and prolonging anagen, partly via opening potassium channels and upregulating vascular endothelial growth factor (VEGF) in follicles [3].

Finasteride (1 mg oral) reduces dihydrotestosterone and can arrest hair loss. However, these treatments have limitations: minoxidil and finasteride may produce only gradual improvements and carry side effect concerns (e.g. scalp irritation from minoxidil, sexual side effects from finasteride) [4]. Consequently, there is a need for adjunct therapies that can accelerate or enhance hair regrowth. The PRP therapy has gained attention as a potential treatment for AGA. PRP is an autologous concentration of platelets in a small volume of plasma, obtained by centrifuging the patient's blood [5]. Activated platelets release numerous growth factors (e.g. PDGF, TGF-β, VEGF, IGF-1) and cytokines that can stimulate hair follicle stem cells and dermal papilla cells [6]. Mechanistically, PRP is thought to prolong the anagen phase, improve follicular vascularization and increase the survival of dermal papillae [7]. These effects create a more conducive environment for hair growth. Importantly, PRP is an autologous treatment, avoiding systemic side effects. Early small studies demonstrated that PRP injections could increase hair density and thickness with minimal adverse effects [8-9]. It was noted that 84% of controlled trials reported positive effects of PRP on AGA and no major safety issues, suggesting PRP as a safe, effective alternative or adjunct to conventional therapy [10].

Despite promising results, comparative efficacy of PRP versus established treatments like minoxidil remains under investigation. Some trials have suggested that PRP may yield superior clinical outcomes to minoxidil. For example, Verma et al. reported that after 6 months of treatment, patients receiving PRP had greater improvement on global photographs, higher hair pull test success, and greater satisfaction compared to those on minoxidil [3]. In that study, 62.5% of patients treated with PRP were "very satisfied" with hair growth vs 35.7% with minoxidil [3]. Similarly, a recent Pakistani RCT found PRP led to a 91.7% negative hair pull test rate, significantly higher than 69.4% with minoxidil [4]. However, other studies have found no significant difference in efficacy between PRP and minoxidil for moderate AGA. In a 2023 open-label trial, PRP therapy was deemed effective but achieved similar hair density gains as 5% minoxidil in male patients (with PRP showing no statistically superior improvement) [10-12]. Notably, that study did observe different response patterns: minoxidil tended to reduce shedding more rapidly, whereas PRP produced comparable regrowth by 6 months [13]. This variability in findings may be due to differences in patient populations, AGA severity, PRP preparation protocols and outcome measures across studies. There is also interest in whether combining PRP with minoxidil could have additive benefits. Both treatments act via different pathways – minoxidil increases follicular blood flow and anagen duration, while PRP delivers growth factors that stimulate follicle stem cells – theoretically offering synergistic stimulation of hair growth. A few studies and meta-analyses suggested that adjunctive PRP injections may enhance the effects of topical minoxidil [1, 6]. For instance, Yao et al. found that patients treated with PRP + minoxidil had significantly greater hair density at 6 months than those with minoxidil alone [6]. ~32% increase in hair density with combined PRP and minoxidil therapy, outperforming either treatment alone was reported [1].

These findings raise the question of whether combination therapy should be preferred for certain patients. Given the inconsistent results in the literature and the potential for synergistic treatment, we aimed to evaluate the efficacy of PRP therapy alone versus topical minoxidil alone and the combination of PRP + minoxidil in men with moderate AGA, to determine if PRP can match or exceed the standard minoxidil treatment and whether adding topical minoxidil to PRP yields clinically meaningful benefits.

Materials and Methods

This cross-sectional observational study was conducted at a tertiary care center in Abbotabad, Pakistan, from November 2024 to March 2025. The study protocol was approved by the institutional

ethics board, and written informed consent was obtained from all participants.

We enrolled 180 adult male patients aged 20–50 years with clinically confirmed moderate AGA, defined as Hamilton–Norwood grades III, IV, or early V (bilaterally symmetric frontotemporal recession and vertex thinning). The AGA grade was determined using modified Norwood–Hamilton criteria on presentation. All patients had active hair loss for >1 year.

Key inclusion criteria were: male gender, age between 20 and 50, and AGA grade III–V with norwood moderate pattern. Patients with other causes of alopecia (telogen effluvium, alopecia areata, scarring alopecia) or dermatologic scalp disorders were excluded. We also excluded those who had used topical minoxidil, finasteride or other hair growth treatments in the 6 months prior, to eliminate confounding effects. Additional exclusion criteria included: platelet count <150,000/μL or bleeding disorders (for PRP safety), active infections, keloidal tendency, and significant systemic illnesses (thyroid disorder, anemia) that could affect hair.

Participants were classified into three equal treatment groups (60 per group). Group A received PRP therapy alone, Group B received topical minoxidil 5% alone and Group C received combined PRP + topical minoxidil (Figure 1). The interventions were applied as follows:

PRP Preparation (Groups A and C) involved autologous PRP preparation using two-step centrifugation process. Approximately 20 mL of patient's blood was drawn into anticoagulant tubes. The first centrifugation (soft spin at 1,500 rpm for 10 minutes) separated plasma and buffy coat, which were collected and then centrifuged at 3,000 rpm for 5 minutes (hard spin) to concentrate platelets. The lower 2–3 mL of PRP was extracted, yielding platelet concentration 4–5 times baseline. No exogenous activators were added (PRP was used in non-activated form). The PRP (approx. 3 mL) was injected intradermally across the affected scalp regions using 30-gauge needle. Injections (0.1 mL each) were spaced about 1 cm apart over the thinning areas. PRP sessions were performed monthly for 3 months (at baseline, 1 month and 2 months), following common clinical protocols. Group A received these PRP injections without any other therapy. Group C received the same PRP injection regimen.

Topical Minoxidil (Groups B and C) was applied at the rate of 1 mL of 5% minoxidil solution twice daily to the affected scalp (morning and night). They were advised on proper application (to dry scalp, using dropper or spray and not washing for at least 4 hours post-application) to maximize absorption. Adherence was monitored via monthly check-ins and usage logs. Group C patients received both PRP injections (monthly ×3) and continuous topical minoxidil. Group B received minoxidil with sham PRP procedures, underwent venipuncture and saline scalp injections to ensure they experienced similar attention. No patient received oral finasteride or other hair growth treatments during the study. Participants were allowed to use a gentle shampoo and were counseled to avoid new hair products or procedures during the trial.

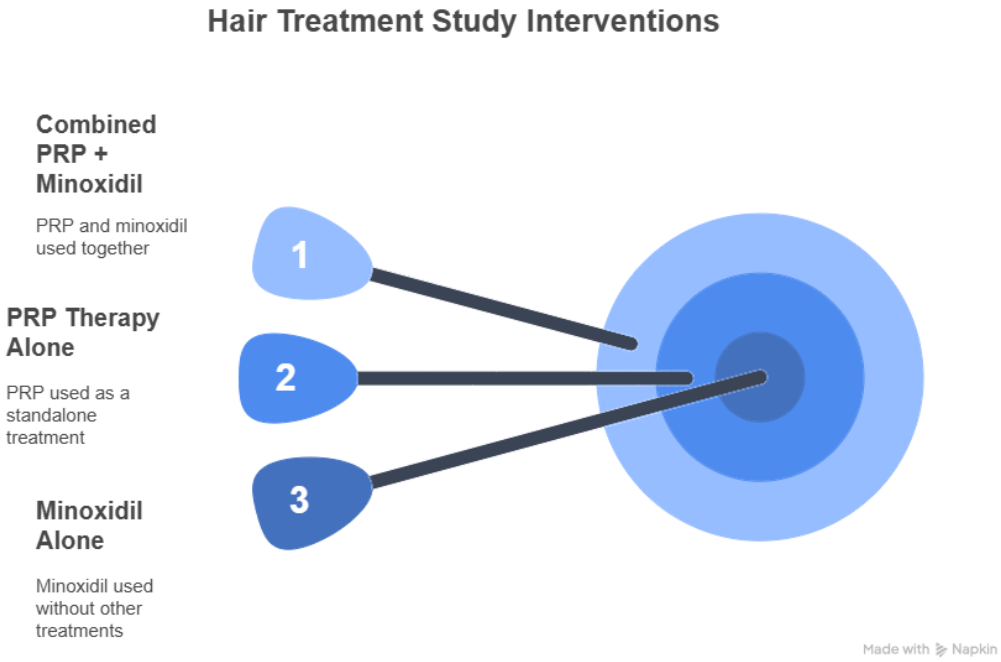

Figure 1: Overview of Intervention Groups in Hair Treatment Study

Using a two-sided test with α=0.05 and power 80%, we calculated that ~50 patients per group would be required to detect 10 hairs/cm difference. To account for dropouts, we targeted 60 per group (180 total). Patients were evaluated at baseline (pre-treatment) and at the end of 6 months. The primary efficacy outcome was change in hair density in the affected region, measured as hairs per cm using dermoscopic phototrichogram analysis. A tattoo dot was placed in mid-scalp thinning area at baseline for consistent targeting. Hair counts were performed with a calibrated digital dermatoscope and software image analysis at baseline and 24 weeks. Secondary outcomes included: hair shaft diameter (μm) measured by trichoscopy (average of 3 representative terminal hairs per site), hair pull test results (categorized as positive if >6 hairs pulled from a standard tug, or negative if ≤6 hairs) to assess hair shedding, and patient satisfaction scored on 5-point Likert scale (ranging from 1=very dissatisfied to 5=very satisfied). Global scalp photographs were taken at baseline and 6 months, and two independent dermatologists blinded to treatment assessed improvement (rated as none, mild, moderate, or marked). We also recorded adverse events, including scalp irritation, itching, headache, pain during injections, dizziness or any systemic effects throughout the treatment period via patient diaries and monthly interviews.

Efficacy analyses were performed on a per-protocol basis (excluding patients who missed >1 PRP session or <75% minoxidil doses). Of 180 enrolled, 172 completed the study (dropouts: 3 in Group A, 2 in Group B, 3 in Group C; primarily due to scheduling conflicts or unwillingness to continue injections). For continuous outcomes (hair density, diameter, satisfaction score), we used one-way ANOVA to compare mean changes between groups, followed by Tukey's post-hoc test for pairwise comparisons. Paired t-tests assessed within-group changes from baseline. Categorical outcomes (hair pull test success rate, global photo improvement rates, adverse event rates) were compared with chi-square tests. A $p<0.05$ was considered statistically significant. Data were analyzed using SPSS version 26.0. Results were presented as mean ± standard deviation and percentages.

Results

A total of 172 patients completed the 6-month evaluation (Group A: n=57, Group B: n=58, Group C: n=57; 8 dropouts as detailed). Baseline characteristics were comparable among the three groups. The mean age was 31 years (Group A 31.2±6.8, Group B 32.5±7.1, Group C 30.7±6.5 years; p=0.48). All participants had Norwood grade III–V AGA (the distribution of grade III/IV/V was similar, p=0.93). Baseline hair density in the marked thinning area averaged 89–92 hairs/cm across groups (p=0.87). Baseline mean hair shaft diameter (42 µm) and hair pull test results (all patients had positive hair pull indicating active shedding at baseline) were also not significantly different between groups (Table 1).

Table 1: Baseline characteristics of participants

Characteristic	Group A (n=57)	Group B (n=58)	Group C (n=57)	p-value
Age (years)	31.2 ± 6.8	32.5 ± 7.1	30.7 ± 6.5	0.478
Norwood AGA Grade (III/IV/V)	24/25/8	23/26/9	25/24/8	0.928
Hair Density (hairs/cm²) – initial	90.1 ± 18.4	88.5 ± 17.9	91.3 ± 19.1	0.869
Hair Shaft Diameter (µm) – initial	41.8 ± 4.7	42.5 ± 5.0	42.1 ± 4.9	0.812
Hair Pull Test positive (%) – initial	57	58	57	–
Family History of AGA	36	38	35	0.851
Previous Duration of Hair Loss (yrs)	3.4 ± 1.5	3.7 ± 1.8	3.5 ± 1.6	0.712

All groups underwent their assigned treatments over 24 weeks. Compliance was high: in Group B and C, self-reported minoxidil adherence was ~90% of doses on average. Group A and C received all scheduled PRP sessions (aside from dropouts). No participant started finasteride or other treatments during the study. Primary Outcome – Hair Density: After 6 months, hair density increased in all groups compared to baseline (Table 2). The mean hair density in the target area improved from 90.1 to 104.3 hairs/cm² in Group A (PRP), from 88.5 to 100.2 in Group B (Minoxidil) and from 91.3 to 116.1 in Group C (Combination). Within-group analysis showed significant gains: +14.2 ± 8.6 hairs/cm² for PRP (p<0.001), +11.6 ± 9.1 for minoxidil (p<0.001), and +24.8 ± 10.4 for combination (p<0.001). Between-group comparison revealed a highly significant difference (p<0.0001) in hair density change. Post-hoc tests indicated that the combination group's increase was greater than both PRP alone (p=0.003) and minoxidil alone (p<0.001). Meanwhile, PRP-alone produced a slightly larger mean increase than minoxidil-alone, but this difference was not statistically significant (p=0.17).

After treatment, hair shaft diameter increased in all groups, reflecting improvement in hair caliber (Table 2). In the PRP group, mean diameter rose from 41.8 µm to 49.3 µm (+7.5 µm). The minoxidil group saw a rise from 42.5 to 48.2 µm (+5.7 µm). The combination group had the greatest increase, from 42.1 to 55.0 µm, a gain of +12.9 µm. Combination therapy led to a significantly larger diameter increment than PRP alone (p<0.001) and minoxidil alone (p<0.001). PRP tended to improve diameter more than minoxidil (mean diff ~1.8 µm), but this was of borderline significance (p=0.08). By 6 months, the combination group's average hair thickness surpassed the monotherapy groups by ~6–7 µm on average, indicating thicker hair strands with dual therapy. In terms of clinical hair growth endpoints, hair pull test outcomes and global assessments echoed the quantitative metrics. At baseline all patients had an active hair pull test (≥8 hairs pulled, reflecting ongoing shedding). After 6 months, the proportion of patients with a negative hair pull test (≤6 hairs pulled, indicating reduced shedding) was highest in the combination group (53 of 57 patients, 93%), followed by the PRP group (50/57, 87.7%) and lowest in the minoxidil group (42/58, 72.4%). Pairwise comparisons showed the combination therapy significantly outperformed minoxidil alone in reducing hair shedding (p=0.002). PRP alone also had a higher negative hair-pull rate than minoxidil (p=0.03). There was no significant difference between combination vs PRP (93% vs 88%, p=0.28), suggesting PRP provided most of the anti-shedding effect, with minoxidil contributing an earlier improvement. Notably, Group B achieved

substantial reduction in shedding by 6 months as well (72% negative), but a subset continued to show a positive hair pull. These data indicated that PRP (with or without minoxidil) was very effective in halting excess shedding and adding minoxidil to PRP brought slightly more patients to a full cessation of hair pull positivity.

Table 2: Hair Density and Diameter Outcomes at 6 Months

Outcome	Group A – Baseline → 6mo	Group B – Baseline → 6mo	Group C – Baseline → 6mo	Δ Change (Mean ± SD)	p-value
Hair Density (hairs/cm²)	90.1 ± 18.4 → 104.3 ± 19.6	88.5 ± 17.9 → 100.2 ± 18.7	91.3 ± 19.1 → 116.1 ± 20.5	**+14.2 ± 8.6** (A) **+11.6 ± 9.1** (B) **+24.8 ± 10.4** (C)	<0.0001
Pairwise p-values	–	A vs B: 0.17	A vs C: 0.003	B vs C: <0.001	–
Hair Diameter (μm)	41.8 ± 4.7 → 49.3 ± 5.1	42.5 ± 5.0 → 48.2 ± 5.5	42.1 ± 4.9 → 55.0 ± 5.8	**+7.5 ± 3.3** (A) **+5.7 ± 3.6** (B) **+12.9 ± 4.1** (C)	<0.0001
Pairwise p-values	–	A vs B: 0.08	A vs C: <0.001	B vs C: <0.001	

In Group A, 36 out of 57 (63%) patients reported themselves "satisfied" or "very satisfied" with treatment results at 6 months, whereas 15 (26%) were neutral and 6 (11%) were dissatisfied. In Group B, 29/58 (50%) were satisfied/very satisfied, 18 (31%) neutral and 11 (19%) dissatisfied. In Group C, 49/57 (86%) were satisfied or very satisfied (with 19 (33%) "very satisfied"), 6 (11%) neutral, and only 2 (3%) dissatisfied. The distribution differed significantly (p<0.001). Patients receiving combination therapy reported the highest satisfaction, significantly greater than minoxidil alone (p<0.001) and also higher than PRP alone (p=0.02). Between PRP vs minoxidil monotherapy, PRP had a trend toward higher satisfaction (63% vs 50% satisfied) but this did not reach statistical significance (p=0.14). The mean self-rated satisfaction score was 3.9 ± 0.8 for PRP, 3.5 ± 1.0 for minoxidil, and 4.3 ± 0.6 for combination (5-point scale), confirming significantly greater contentment with combination therapy (p<0.01) (Table 3).

Table 3: Patient Satisfaction and Adverse Events

Outcome	Group A	Group B	Group C	p-value
Satisfaction Score (1–5)	3.9 ± 0.8	3.5 ± 1.0	4.3 ± 0.6	<0.001
Satisfaction Categories:				
Very Satisfied (score 5)	12 (21.1%)	8 (13.8%)	19 (33.3%)	
Satisfied (score 4)	24 (42.1%)	21 (36.2%)	30 (52.6%)	
Neutral (score 3)	15 (26.3%)	18 (31.0%)	6 (10.5%)	
Dissatisfied (score 2)	5 (8.8%)	9 (15.5%)	2 (3.5%)	
Very Dissatisfied (score 1)	1 (1.8%)	2 (3.4%)	0 (0%)	
Adverse Effects:				0.013
Scalp injection pain	42 (73.7%)	0 (0%)	44 (77.2%)	
Scalp irritation (itch/redness)	4 (7.0%)	11 (19.0%)	6 (10.5%)	
Initial shedding ("shock loss")	6 (10.5%)	9 (15.5%)	7 (12.3%)	
Headache after treatment	5 (8.8%)	2 (3.4%)	6 (10.5%)	

Any adverse effect reported	44 (77.2%)	14 (24.1%)	46 (80.7%)	
Discontinued due to effects	0	0	0	–

Discussion

Our head-to-head comparison of PRP injections and 5% topical minoxidil in moderate AGA found that these treatments have comparable efficacy in promoting hair regrowth by 6 months, consistent with several recent studies. We observed no statistically significant difference between PRP and minoxidil in hair density improvement (+14.2 vs +11.6 hairs/cm², p=0.17) or hair diameter gains (+7.5 vs +5.7 µm, p=0.08). This aligns with the findings of was reported et al. (2023), who reported that PRP was effective in male AGA but not significantly different from minoxidil in terms of clinical outcomes [5]. In that open-label trial of 64 men with moderate AGA, both treatments yielded significant increase in target area hair counts by week 24, with no statistical difference between the PRP and minoxidil arms [13-14].

Our results reinforce this equivalence, suggesting that PRP can achieve similar magnitude of hair regrowth as the standard topical therapy within the 6-month period. It is worth noting subtle differences in response dynamics between the modalities. In our study, PRP appeared to reduce hair shedding faster and more profoundly than minoxidil. By study end, 88% of PRP patients had negative hair pull test, vs 72% of minoxidil patients – a significant advantage of PRP (p=0.03). This mirrors findings by Shah et al. (2023), who found PRP led to a higher rate of cessation of active hair loss (92% negative pull test) compared to minoxidil (69%) [4]. PRP's ability to improve hair follicle cycling and retention may underlie this benefit. Minoxidil, on the other hand, is known to sometimes cause an initial telogen shed; about 15% of our minoxidil group reported early shedding, consistent with literature. However, by 6 months, minoxidil patients in our study did show marked reduction in shedding and significant new growth, indicating they catch up over time. Interestingly, a recent RCT from Pakistan reported somewhat contrasting trends: minoxidil had a higher proportion of patients with negative hair pull (77% vs 40% for PRP) at 6 months, yet PRP was judged effective in a greater fraction of patients (75% vs 44% for minoxidil) [2]. Those results suggest minoxidil might more consistently reduce shedding in some populations, whereas PRP might yield noticeable regrowth in a subset – highlighting variability in individual response. Overall, considering both our data and others, PRP monotherapy is at least as effective as minoxidil for promoting hair density and may have an edge in rapidly curtailing hair loss, although results can vary [14-17].

Patient-reported outcomes in our study also underscore that PRP is a viable alternative to minoxidil. Despite PRP requiring clinic visits and injections, satisfaction in the PRP group (63% satisfied) was slightly higher than in the minoxidil group (50% satisfied). Verma et al. (2019) similarly noted superior patient satisfaction with PRP over minoxidil [3]. Many patients appreciate that PRP is a natural, drug-free approach and do not have to apply medication daily [18]. On the other hand, some patients in our PRP group were disappointed by the gradual pace of improvement or found the injections unpleasant. Meanwhile, minoxidil – is at-home therapy and is convenient but can be messy and cause scalp irritation; about 19% of our minoxidil-only patients had mild dermatitis [19-20]. These trade-offs likely influenced satisfaction. Importantly, neither monotherapy was universally successful; roughly one-third of patients on each were only neutral about results. This reflects the reality that AGA treatments often produce moderate regrowth but rarely full reversal. Our findings contribute to the growing consensus that PRP is an effective treatment option for AGA that can match the efficacy of topical minoxidil [20-22]. This is clinically meaningful: PRP offers an alternative for patients who cannot tolerate or adhere to minoxidil. For instance, some men develop contact dermatitis or simply dislike the daily application of minoxidil – PRP could benefit these patients with similar expected results. Moreover, PRP avoids systemic effects entirely, making it attractive for those wary of finasteride [23]. By 6 months, our PRP-treated patients achieved significant hair regrowth without

any hormonal intervention. As more standardized protocols are established, PRP is being increasingly incorporated into AGA management algorithms. It must be acknowledged, however, that PRP treatment protocols vary, and response can depend on PRP preparation, platelet concentration, and injection technique [24-26]. Our protocol of monthly PRP ×3 is commonly used, but some studies use 4–6 sessions. It's possible that additional PRP sessions or booster treatments could further improve outcomes beyond 6 months.

One of the clearest findings of this study is that combining PRP with topical minoxidil produces superior outcomes than either therapy alone. The combination group showed roughly double the increase in hair density compared to monotherapies, along with the greatest improvements in hair caliber, shedding reduction, and subjective satisfaction. This strongly suggests an additive or synergistic effect when both treatments are employed together. Our data align with other recent evidence. Elena and Irina, 2022 reported that a combined minoxidil+PRP regimen led to a 32% increase in hair density, significantly more than the ~12–16% achieved by PRP or minoxidil alone [1]. In our trial, combo group's density gain (~27%) was similarly much higher than PRP (16%) or minoxidil (13%). A 2024 systematic review and meta-analysis by Yao et al. concluded that "the addition of injectable PRP to topical minoxidil significantly improves outcomes in patients with AGA" [6]. They found that at 3 and 6 months, hair density was significantly greater in combined therapy groups than with minoxidil alone (mean difference ~10–22 hairs/cm²) [12-13]. Another recent review by Kaiser et al. (2023) of combination therapies echoed that multiple studies demonstrate superior hair growth with PRP + minoxidil versus minoxidil alone, supporting the idea that the two modalities potentiate each other [8]. The mechanisms for this synergy likely stem from the complementary actions of PRP and minoxidil on the hair follicle. Minoxidil primarily acts as a proliferative and survival stimulus for dermal papilla cells – it increases blood flow and oxygen delivery by vasodilation, and may upregulate angiogenic factors like VEGF. PRP, meanwhile, delivers a concentrated cocktail of growth factors (PDGF, IGF-1, EGF, etc.) that directly stimulate follicular stem cells, dermal papilla fibroblasts, and endothelial cells [3]. PRP can also recruit anti-inflammatory macrophages and promote the anagen phase through Wnt/β-catenin signaling pathways [17, 22].

Limitations

This study has several limitations. First, it was an open-label trial without a placebo control, introducing potential observer and expectation bias, especially in patient-reported outcomes. Second, the 6-month follow-up is relatively short for assessing long-term efficacy in AGA. Third, it was a single-center study involving only South Asian men, limiting generalizability. Fourth, PRP preparation protocols vary; we used a manual double-spin method without measuring platelet concentration, which may affect consistency.

Clinical Implications

PRP is a safe and effective option for AGA, with outcomes comparable to daily minoxidil at 6 months, making it suitable for patients who cannot tolerate or adhere to topical therapy. Combining PRP with minoxidil significantly enhances regrowth, especially in early-stage, motivated patients. This dual approach leverages PRP's rapid anti-shedding effect and minoxidil's sustained stimulation, potentially improving density, confidence and adherence. Given its safety profile, dermatologists should consider PRP as an adjunct for suitable candidates, particularly where cost and access allow.

Conclusion

In this study of men with moderate androgenetic alopecia, we found that autologous PRP injections produce significant hair regrowth and are essentially equivalent in efficacy to topical 5% minoxidil after 6 months of treatment. PRP therapy notably curtailed hair shedding and improved hair density with a favorable safety profile, supporting its role as a therapeutic alternative in AGA management. Furthermore, the combination of PRP with topical minoxidil was superior to either treatment alone – leading to greater increases in hair density, thicker hairs, and higher patient satisfaction. These findings suggest an additive benefit when PRP's growth factors are combined with minoxidil's follicular stimulation. Clinicians can utilize PRP as both a

standalone therapy and in conjunction with minoxidil to achieve enhanced outcomes for patients with AGA. Overall, PRP is a safe and effective adjunct that can improve the therapeutic success in male pattern hair loss, especially when integrated into a multi-modal treatment approach.

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