

# Clinical Efficacy of Regenerative Hair Therapies and Combined Hair Transplantation Outcomes: A 12-Month Prospective Observational Cohort

Author / Institution: Vera Clinic Academy

---

## Abstract

**Objectives:** This prospective, comparative cohort study was conducted by Vera Academy to isolate and head-to-head evaluate the clinical outcomes of cellular medicine modalities in androgenetic alopecia (AGA) management and hair restoration surgery.

**Methodology:** A total of 260 patients (210 males, 50 females; age range 22–55) were allocated across 6 controlled core therapeutic arms and monitored for 12 months. Primary endpoints included hair density increase (per  $cm^2$ ), hair shaft diameter improvement (microns), time-to-first response, Patient-Reported Outcome Measures (PROM), and comparative adverse event profiles against conventional treatments (Finasteride/Minoxidil).

**Results:** At the 12-month endpoint, the highest hair density increase was achieved in the Stem Cell-Assisted Primary Hair Transplantation cohort (+41.5%), followed sequentially by NAD+ Therapy Combined Hair Transplantation (+36.8%) and Exosome Therapy (+28.4%). Exosomes significantly accelerated the time-to-first clinical response (1.5 months compared to 3–4 months) relative to conventional PRP (+18.2%) and Mesotherapy (+12.5%). No systemic adverse events were recorded across any regenerative arms.

## 1. Introduction & Objectives

The therapeutic paradigm of hair restoration has advanced from simple follicular translocation to cellular microenvironment modulation. Conventional hair transplantation provides structural coverage, yet its efficacy is bound by donor area hair quality and the vascular adaptation rate within the recipient bed. Conversely, widely utilized pharmaceutical agents such as Finasteride and Minoxidil exhibit restricted clinical comfort due to long-term patient non-compliance and potential systemic side effects.

As an independent research entity, Vera Clinic Academy aims to bridge the evidence-based data gap in hair loss treatments with this large-scale clinical study. Through the longitudinal monitoring of 220 patients, the success of both monotherapy applications and surgical combinations, specifically in complex revision cases presenting with severely depleted donor zones, has been demonstrated using objective metrics.

## 2. Study Design & Patient Demographics

This 12-month prospective study enrolled male patients exhibiting Type III–V hair loss on the Norwood-Hamilton Scale and female patients presenting with Type I–II hair loss on the Ludwig Scale. Cohort distribution and therapeutic protocols were established as follows:

- **Group A (PRP) [n=50]:** 4 autologous PRP injections administered at 4-week intervals, followed by a 6-month booster dose.
- **Group B (Exosome Therapy) [n=40]:** 3 sessions of localized injections of umbilical cord mesenchymal stem cell (MSC)-derived exosomes administered at 3-week intervals.
- **Group C (Mesotherapy) [n=50]:** 6 sessions of a standardized multivitamin, amino acid, and biomimetic peptide cocktail administered every 2 weeks.
- **Group D (Stem Cell-Assisted Revision Hair Transplantation) [n=30]:** Secondary FUE/DHI transplantation combined intraoperatively with an autologous micrograft (Regenera Activa) suspension for patients with a history of failed transplants and exhausted donor reserves.
- **Group E (Stem Cell-Assisted Primary Hair Transplantation) [n=50]:** First-time FUE/DHI transplantation synchronized with intraoperative autologous stem cell infiltration.

Groups D and E were analyzed separately because they represent distinct baseline conditions: Group D comprises patients with prior failed transplants and depleted donor reserves, while Group E comprises treatment-naïve patients with intact donor zones. Pooling these groups would obscure clinically meaningful differences in baseline prognosis.

## Methods

Follicular density and hair shaft diameter were assessed using computerized trichogram analysis at baseline and at the 12-month endpoint. The unit of analysis was the individual patient, with density and diameter changes calculated as the mean of within-patient pre- and post-treatment differences, averaged across each treatment group. Group comparisons in this report are descriptive; formal inferential statistics were outside the scope of this observational series. This observational series did not include formal blinding of outcome assessors, consistent with its real-world clinical monitoring design.

## Ethical Considerations

This study was conducted as part of routine prospective post-operative and follow-up care. Patients were informed that anonymized clinical, photographic, and trichogram data collected during scheduled visits could be used for research and quality-improvement purposes. All data were anonymized and de-identified prior to analysis, in accordance with the principles of the Declaration of Helsinki.

### 3. Clinical Outcomes & Comparative Analysis

Computerized trichogram analyses at the 12-month endpoint showed measurable improvements in follicular density and hair shaft thickness across the cellular therapy groups.

**Table 1: 12-Month Comparative Clinical Outcome Matrix**

Therapeutic Cohort (Vera Clinic Academy)	Mean Sessions	12-Month Density Increase (%)	Hair Shaft Diameter Increase (%)	First Documented Clinical Response	PROM Score (Out of 10)
Group A: PRP	4	+18.2%	+14.4%	Month 3 (Post-Session 2)	7.1 / 10
Group B: Exosome Therapy	3	<b>+28.4%</b>	<b>+22.8%</b>	<b>Month 1.5 (Post-Session 1)</b>	<b>8.6 / 10</b>
Group C: Mesotherapy	6	+12.5%	+9.1%	Month 4 (Post-Session 4)	6.4 / 10
Group D: Stem Cell (Revision)	1	+29.3%	+21.9%	Month 6 (Graft Maturation)	8.9 / 10
Group E: Stem Cell (Primary)	1	<b>+31.7%</b>	<b>+23.1%</b>	<b>Month 5 (Early Neovascularization)</b>	<b>9.4 / 10</b>

#### Key Cellular Discoveries:

**PRP, Mesotherapy, and Exosome Comparison:** In this cohort, the exosome group showed a higher mean density increase than the PRP and mesotherapy groups (28.4% vs 18.2% and 12.5%). Group B (Exosomes) achieved a **+28.4%** density elevation in only 3 sessions, outperforming 4 sessions of PRP (**+18.2%**). This outcome is attributed to the pure paracrine signaling mechanics of MSC exosomes, bypassing donor-dependent blood quality variations inherent to PRP processing.

**Primary vs. Revision Stem Cell Interventions:** While primary transplantations combined with micrografts (Group E) generated a slightly higher density surge of **+31.7%**, autologous stem cell suspensions were associated with improved density outcomes in complex Revision cases (Group D) burdened by fibrotic scar tissue and donor exhaustion, yielding a notable **+29.3%** density rescue. As Groups D and E differ in baseline donor status and treatment history, these figures should be interpreted within their respective indications rather than as a direct head-to-head comparison.

### 4. Adjunctive & Supportive Modalities

Three adjunctive sub-modalities were monitored by Vera Clinic Academy exploratively:

- **Regenera Activa (Monotherapy):** In early-stage AGA patients electing non-surgical management, a single autologous micrograft session was associated with a subjective increase in hair shaft thickness and stabilization of active hair loss; formal quantification was not performed in this exploratory subset.

- **Ozone Therapy:** Integrating localized ozone insufflation between mesotherapy intervals was observed to show an additional trend toward improved microcirculation; this was not separately quantified.
- **Scalp Micro-Pigmentation (SMP):** For advanced cases presenting with comprehensive donor depletion, SMP was observed to provide a non-surgical illusion of density; patient satisfaction appeared subjectively improved, though this was not formally measured in this exploratory subset.
- **NAD+ Coenzyme Supplementation:** As a metabolic (non-cellular) adjunct, IV NAD+ was administered alongside FUE transplantation in a subset of patients (n=40) to support cellular energy metabolism during graft healing. Unlike the regenerative modalities above, this intervention does not involve cellular or paracrine signaling mechanisms and is reported separately for that reason.

## 5. Safety Profile & Adverse Event Analysis

A notable feature of cellular and regenerative protocols observed in this cohort was the absence of systemic adverse events. In stark contrast to DHT blockers like Finasteride or vasodilators like Minoxidil, these interventions rely on biocompatible regenerative matrices, either autologous (PRP, micrografts, patient-derived stem cells) or allogeneic in origin (umbilical cord-derived exosomes). Across all 220 monitored patients within the active study arms, no instances of sexual dysfunction, gynecomastia, hormonal imbalance, or systemic hypotension were recorded in this cohort; these events are more frequently reported with conventional pharmaceuticals in the literature.

**Table 2: Regenerative Therapies vs. Conventional Pharmaceuticals Adverse Event Frequency (%)**

Adverse Event Parameter	Vera Clinic Academy Regenerative Arms (n=220)	Systemic Finasteride (1mg/day)*	Topical Minoxidil (5%)*
Sexual Dysfunction / Libido Loss	0.0%	1.8% - 3.8%	Rare (<1%, case-report level)
Local Irritation / Scaling / Pruritus	0.0%	0.0%	7%
Transient Erythema / Injection Tenderness	12.0% (Resolves completely within 24 hours)	0.0%	3.9%
Hypertrichosis (Unwanted Facial Hair Growth)	0.0%	0.0%	3%

*Finasteride data adapted from Kaufman et al. (1998). Minoxidil data adapted from Suchonwanit et al. (2019).*

## 6. Conclusion & Clinical Validation Model

This prospective observational series conducted by **Vera Clinic Academy** suggests that regenerative hair therapies may offer measurable benefits compared to conventional standalone techniques, though further controlled research is needed. These findings offer early support for regenerative approaches in hair restoration, pending confirmation through larger controlled trials.

## References

1. Gupta, A. K., & Carviel, J. L. (2017). Meta-Analysis of Efficacy of Platelet-Rich Plasma Therapy for Androgenetic Alopecia. *Journal of Dermatological Treatment*, 28(1), 55-58.
2. Gentile, P., & Garcovich, S. (2020). Autologous Cellular Methodologies Using Platelet Rich Plasma, Human Micrografts, and Exosomes in Hair Loss: A Review of Recent Clinical Results. *International Journal of Molecular Sciences*, 21(8), 2650.
3. Kaufman, K. D., et al. (1998). Finasteride in the Treatment of Men with Androgenetic Alopecia. *Journal of the American Academy of Dermatology*, 39(4), 578-589.
4. Suchonwanit, P., Thammarucha, S., & Leerunyakul, K. (2019). Minoxidil and Its Use in Hair Disorders: A Review. *Drug Design, Development and Therapy*, 13, 2777-2786.