

PRP, Exosomes and Regenerative Hair Therapies

An evidence review for androgenetic alopecia

IN BRIEF

Androgenetic alopecia is the most common form of progressive hair loss. Several regenerative approaches are being studied alongside established treatments such as minoxidil.

PRP has the larger and more mature evidence base of the regenerative options. Exosome-based hair products are newer and less studied.

No regenerative modality has been shown to be superior to the others in robust, standardized comparative trials. Claims of superiority should be treated with caution.

Introduction

Androgenetic alopecia is the most common form of progressive hair loss. Regenerative approaches, including platelet-rich plasma, photobiomodulation, stem cell therapies and exosomes, have drawn growing clinical and research interest as alternatives or complements to established treatments such as minoxidil.[1,2]

PRP for hair restoration

PRP delivers a concentration of platelet-derived growth factors directly to the scalp, which researchers believe may support hair follicle activity. A 2025 systematic review comparing exosome therapy, PRP and minoxidil found that each modality has supporting evidence, but that study designs, outcome measures and follow-up periods vary considerably across the literature, which complicates direct comparison.[2]

Exosomes for hair restoration

Exosome-based products are a newer entrant. Because exosomes are acellular and carry no live cells, they are of interest as a potentially more standardizable alternative to cell-based therapies. As with other exosome applications, isolation and dosing standards are still developing across the field.[2]

Comparative evidence

A comprehensive review titled Promises and Pitfalls of Regenerative Therapies for Androgenetic Alopecia examined PRP, photobiomodulation, stem cell therapies and exosomes together. Its central conclusion is reflected in its title. These therapies show real promise on available evidence, alongside meaningful pitfalls, including inconsistent study quality, variable protocols, and the need for more rigorous standardized trials before strong comparative claims can be made.[1]

Evidence status

Evidence status	What this means
Established	Minoxidil remains the most established, FDA-approved pharmacologic treatment for androgenetic alopecia and is frequently the benchmark comparator in studies of newer regenerative approaches.[2]

Evidence status	What this means
Emerging	PRP has a larger and more mature evidence base than exosomes for hair restoration, though it also suffers from inconsistent preparation and reporting standards, as documented broadly in the PRP literature.[2,3]
Limited	Exosome-based hair-restoration products are the newest and least studied of the modalities discussed here. Claims of superiority over PRP or minoxidil are not currently supported by robust, standardized comparative trials.[1,2]

Key points

- ▪ PRP, photobiomodulation, stem cell therapies and exosomes are all being studied for androgenetic alopecia, alongside established options such as minoxidil.
- ▪ PRP has a more established evidence base than exosome therapy for this indication.
- ▪ Exosome-based hair products are newer and less standardized. Promising, but not proven superior to existing options.
- ▪ Direct comparison between modalities is complicated by inconsistent study designs and preparation protocols.

Source verification

Claim in this document	Source	Evidence strength	Limitations
PRP, photobiomodulation, stem cells and exosomes reviewed together for androgenetic alopecia	Gupta, Wang, Welter, Unger, Mejia. Med Sci (Basel), 2025. PMID PMC12821594	High, peer-reviewed review	Comparative review; individual primary-study quality varies
Systematic comparison of exosome therapy, PRP and minoxidil; variable study designs limit comparison	Darwish et al., Cureus, 2025. PMID PMC12351504	High, systematic review	Published in an open peer-review journal
PRP preparation lacks standardized reporting, as background context	Bardini et al., LabMed, 2026. DOI 10.3390/labmed3010008	High	Source is orthopedic PRP literature, not hair-restoration specific

References

[1] Gupta AK, Wang T, Welter R, Unger R, Mejia R. Promises and Pitfalls of Regenerative Therapies for Androgenetic Alopecia: Platelet-Rich Plasma, Photobiomodulation, Stem Cells, and Exosomes. Med Sci (Basel). 2025;14(1):5. DOI 10.3390/medsci14010005. PMID PMC12821594.

[2] Darwish R, Zakhary M, Wingate K, et al. From Cells to Strands: A Systematic Review Comparing Exosome Therapy, Platelet-Rich Plasma, and Minoxidil for Androgenetic Alopecia Treatment. Cureus. 2025 Jul 14;17(7):e87875. DOI 10.7759/cureus.87875. PMID PMC12351504.

[3] Bardini M, Clementi G, Torcianti M, Del Bianco D, Cantori I, Procaccini R, Gigante A. Standardization of Platelet-Rich Plasma Preparation in Orthopedics. LabMed. 2026;3(1):8. DOI 10.3390/labmed3010008.

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