

Androgenetic alopecia: may growth factor mimetic oligopeptides supplement minoxidil and finasteride therapy?

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September 12, 2023

BACKGROUND Androgenetic alopecia, often referred to as male pattern baldness, stands as the most prevalent form of alopecia. It is primarily characterized by a progressive reduction in hair diameter, length, and pigmentation.¹ This process is driven by the influence of androgens, specifically dihydrotestosterone (DHT), in individuals genetically predisposed to this condition. The manifestation of androgenetic alopecia typically centers on the frontal and vertex regions of the scalp, while interestingly, the occipital area is usually spared from its effects.² This localized pattern of hair loss can create distinctive patterns, such as receding hairlines and balding crowns, that are recognizable hallmarks of this condition. Beyond its mere physical impact, androgenetic alopecia exerts a profound influence on the psychological and emotional well-being of those affected. Hair is not merely a biological feature; it often carries a significant part of an individual's identity and self-esteem.³ Consequently, the hair loss experienced in androgenetic alopecia can result in feelings of diminished self-confidence and self-image.

CASE REPORT We report the case of a 35-year-old man without comorbidities. The patient comes to the attention of the dermatologist complaining a progressive hair loss over the past 2 years. The patient reports that, at first, the hair loss was evidenced by the presence of hair on the pillow when he woke up and later, he noticed increased hair loss while showering. He initially attributed the fall to a period of work stress and did not give importance to it. However, progressive thinning in the fronto-parietal and vertex region led him to pay more attention to the problem, until he decided to book a dermatological examination with the intention of undergoing a hair transplant. At the dermatological examination, the patient presented a clinical picture compatible with androgenetic alopecia with involvement of the frontal and vertex region assessable as grade V, according to the Hamilton-Norwood scale⁴ (Figure 1A). Pull Test was positive and trichoscopy showed miniaturization of hair in androgen-dependent areas and hair reduction per pilo-sebaceous unit. The patient reported that hair loss had a strong impact on quality of life and personal, work, and relationship habits. In relation to the strong functional and esthetic impact of the problem, before deciding to undergo hair transplantation, the dermatologist proposed a conservative therapy: topical minoxidil 5% two times daily, oral finasteride 1 mg daily and topical application of a gel containing three oligopeptides mimicking growth factors, caffeine and taurine, and an iron chelating complex, one time per week. The patient underwent monthly follow-ups, and at 6 months after the start of the therapy, the results were striking: increased thickness of the shaft at the fronto-parietal and vertex levels and increased hair density per pilo-sebaceous unit were observed (Figure 1D). The patient was satisfied by the treatment and decided to postpone the transplantation.

DISCUSSION Male androgenetic alopecia is the most common cause of hair loss and has a strong impact on the quality of life of patients suffering from it. Currently, there are several treatments approved by the US FDA that have proven efficacy such as oral finasteride and topical minoxidil. On the other hand, some pioneering studies have demonstrated the efficacy of drugs such as dutasteride, topical finasteride, and/or oral minoxidil.

Good emerging alternatives also include nondrug therapies such as platelet-rich plasma or laser therapy with wavelengths between 630 and 660 nm. In addition, studies on topical androgen receptor antagonists and topical cetirizine have provided promising results⁵. Recently, very promising data have been reported regarding the topical use of growth factor mimetic oligopeptides⁶, caffeine⁷, and taurine⁸ in individuals with androgenetic alopecia and/or telogen effluvium. Specifically, weekly use of a gel containing three growth factor mimicking oligopeptides, caffeine and taurine, and an iron chelating complex (GFmgel?) has been shown to be particularly effective in subjects with androgenetic alopecia when used in combination with anti-hair loss medications such as topical minoxidil and oral finasteride⁹. In the case described, the patient applied a gel containing three growth factors mimicking oligopeptides, caffeine and taurine, and an iron chelating complex (GFmgel?) in combination with dual therapy with minoxidil and finasteride. The patient, who initially expressed the will to undergo hair transplantation, was incredibly satisfied with the result achieved with conservative therapy six months later. Although our patient showed an excellent outcome, further real-world studies are needed to confirm the effectiveness of the combination of drug therapy and topical gel containing oligopeptides mimicking growth factors for the treatment of androgenetic alopecia. **Figure 1** Clinical presentation at baseline visit (Figure 1A); after 2 months (Figure 1B), after 4 months (Figure 1C) and after 6 months of therapy (Figure 1D). **References:**

1. Piraccini BM, Alessandrini A. Androgenetic alopecia. *G Ital Dermatol Venereol*. 2014 Feb;149(1):15-24.
2. Lolli F, Pallotti F, Rossi A et al. Androgenetic alopecia: a review. *Endocrine*. 2017 Jul;57(1):9-17. doi: 10.1007/s12020-017-1280-y. Epub 2017 Mar 28. PMID: 28349362.
3. Huang CH, Fu Y, Chi CC. Health-Related Quality of Life, Depression, and Self-esteem in Patients With Androgenetic Alopecia: A Systematic Review and Meta-analysis. *JAMA Dermatol*. 2021 Aug 1;157(8):963-970.
4. Rossi A, Ferranti M, Magri F et al. Clinical and Trichoscopic Graded Live Visual Scale for Androgenetic Alopecia. *Dermatol Pract Concept*. 2022 Apr 1;12(2):e2022078.
5. Saceda-Corralo D, Domínguez-Santas M, Vañó-Galván S et al. What's New in Therapy for Male Androgenetic Alopecia? *Am J Clin Dermatol*. 2023 Jan;24(1):15-24.
6. Shome D, Kapoor R, Surana M et al. Neo[®] hair growth factor formulation for the treatment of hair loss in Covid-19-induced persistent Telogen Effluvium-A prospective, clinical, single-blind study. *J Cosmet Dermatol*. 2022 Jan;21(1):16-23. doi: 10.1111/jocd.14626. Epub 2021 Dec 7.
7. Völker JM, Koch N, Becker M et al. Caffeine and Its Pharmacological Benefits in the Management of Androgenetic Alopecia: A Review. *Skin Pharmacol Physiol*. 2020;33(3):93-109.
8. Kim H, Chang H, Lee DH. Simulative evaluation of taurine against alopecia caused by stress in *Caenorhabditis elegans*. *Adv Exp Med Biol*. 2013; 776:267-76.
9. Lazzari, Tiziana & Milani, Massimo. (2019). Efficacy of Autologous Platelet-Rich Plasma alone or in Combination with a Lotion Containing Growth-Factor like Polypeptides and Taurine in the Treatment of Androgenic Alopecia: A Randomized, Prospective, AssessorBlinded Trial. *Journal of Clinical & Experimental Dermatology Research*.

