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COMBINED TOPICAL MINOXIDIL AND FINASTERIDE THERAPY IN ANDROGENETIC ALOPECIA – NARRATIVE REVIEW

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ABSTRACT

Background Androgenetic alopecia is a chronic progressive disorder characterized by androgen-dependent miniaturization of hair follicles mediated by dihydrotestosterone. Pharmacological management is based primarily on follicular stimulation with topical Minoxidil and inhibition of 5- α -reductase using Finasteride. Because systemic finasteride may be associated with hormonal exposure, interest has shifted toward topical formulations and combined topical therapy.

Aim The aim of this study was to evaluate recent clinical evidence regarding the efficacy and safety of concurrent topical minoxidil and topical finasteride therapy in patients with androgenetic alopecia.

Material and Methods A narrative literature review was performed using the PubMed database. Publications from 1 January 2019 onward were considered. A broad search combining terms related to alopecia, minoxidil and finasteride identified 261 records. After restricting the results to human clinical comparative or interventional studies and excluding review papers, meta-analyses and case reports, 19 records remained. Application of topical-administration criteria yielded 14 candidate publications. Following manual full-text analysis and exclusion of studies not employing simultaneous topical minoxidil and topical finasteride therapy, 5 studies fulfilled the eligibility criteria and were included in the qualitative synthesis.

Results The included studies demonstrated improved hair density and clinical scalp appearance with combination therapy compared with minoxidil monotherapy. Topical finasteride provided local anti-androgenic activity while systemic exposure remained minimal. Reported adverse effects were uncommon and limited mainly to mild local irritation.

Conclusions Combined topical minoxidil and topical finasteride therapy appears to improve treatment effectiveness while maintaining a favorable safety profile. Larger and longer-term controlled studies are required to determine durability of treatment effects and optimal dosing regimens.

KEYWORDS

Alopecia, Topical, Finasteride, Minoxidil, Dihydrotestosterone, Hair

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Introduction

Androgenetic alopecia is the most common cause of chronic hair loss in adults and represents a progressive disorder characterized by patterned thinning of scalp hair. The condition affects a large proportion of men and a smaller but clinically significant proportion of women, with prevalence increasing with age and genetic predisposition (Rossi et al., 2023; Abeck et al., 2023). Familial aggregation indicates that follicular sensitivity to androgens, rather than circulating androgen concentration alone, plays a decisive role in disease expression (Abeck et al., 2023).

The pathogenesis of androgenetic alopecia is primarily mediated by dihydrotestosterone produced from testosterone through the activity of type II 5- α -reductase within dermal papilla cells. Binding of dihydrotestosterone to androgen receptors leads to progressive shortening of the anagen phase and prolongation of the telogen phase, ultimately resulting in follicular miniaturization and gradual conversion of terminal hairs into vellus-like hairs (Rossi et al., 2023; Lubis et al., 2024). Histological observations additionally suggest perifollicular inflammation and structural remodeling, indicating that inflammatory and microenvironmental factors may contribute to disease progression (Lubis et al., 2024).

Current pharmacological management targets two complementary mechanisms. Direct stimulation of follicular activity is achieved with topical Minoxidil, which prolongs the anagen phase, increases hair shaft diameter and enhances perifollicular vascular supply (Abeck et al., 2023). Experimental and clinical observations indicate that these effects may be mediated through potassium channel activation and increased local growth factor expression (Li et al., 2025). Clinical studies confirm that minoxidil slows hair loss progression and induces partial regrowth, particularly in early disease stages (Asad et al., 2024).

The second therapeutic approach involves suppression of androgenic influence using Finasteride, an inhibitor of 5- α -reductase that reduces scalp dihydrotestosterone concentration and slows follicular miniaturization (Rossi et al., 2023). Oral finasteride is effective, but systemic administration leads to

measurable hormonal changes and may be associated with sexual adverse effects in a minority of patients, which can negatively affect adherence (Asad et al., 2024; Li et al., 2025).

To reduce systemic exposure, topical finasteride formulations have been developed. Pharmacokinetic observations demonstrate that topical application can suppress local dihydrotestosterone activity while producing substantially lower systemic concentrations than oral therapy (Abeck et al., 2023; Li et al., 2025). This localized mechanism has increased interest in topical anti-androgen therapy.

The rationale for combining topical finasteride with topical minoxidil is based on complementary mechanisms of action. Finasteride targets the primary pathogenic process by limiting androgen-mediated follicular damage, whereas minoxidil stimulates follicular growth and prolongs the hair cycle. Consequently, simultaneous therapy may both inhibit disease progression and promote regrowth (Rossi et al., 2023; Asad et al., 2024). Recent clinical investigations suggest that combined therapy produces greater improvement in hair density and clinical appearance than monotherapy (Lubis et al., 2024; Li et al., 2025).

Despite growing interest, available clinical evidence remains limited and heterogeneous with respect to drug concentration, formulation and duration of treatment. A structured synthesis of current studies is therefore necessary to better define the therapeutic value and safety profile of combined topical therapy. Therefore, the aim of the present study was to evaluate recent clinical evidence regarding the efficacy and safety of simultaneous topical minoxidil and topical finasteride treatment in patients with androgenetic alopecia.

Methodology

The present study was conducted as a narrative review of recent clinical literature concerning combined topical therapy in androgenetic alopecia. The purpose of the analysis was qualitative evaluation of therapeutic effectiveness and safety rather than statistical meta-analysis.

The literature search was performed using the PubMed biomedical database and restricted to publications from 1 January 2019 onward in order to capture contemporary topical finasteride treatment protocols. Using a broad combination of terms related to alopecia, minoxidil and finasteride, 261 records were initially identified. The results were then restricted to human clinical comparative or interventional studies, while review articles, meta-analyses and case reports were excluded; after this stage 19 publications remained.

Subsequently, search results were limited to publications describing topical administration of both investigated medications, yielding 14 candidate studies. Full texts were manually analyzed with particular attention to treatment protocol and route of administration. Articles in which finasteride was administered orally, studies comparing monotherapies, and studies not employing simultaneous use of both topical agents were excluded. After this manual eligibility assessment only 5 studies fulfilled all criteria and were incorporated into the qualitative synthesis.

From each eligible study data regarding study design, number of participants, treatment duration, formulation and concentration of both medications, outcome assessment methods and adverse effects were extracted. Due to heterogeneity of study methodologies and reported outcomes, the findings were synthesized descriptively.

Results

The analyzed clinical studies investigating the combined use of topical minoxidil and topical finasteride in patients with androgenetic alopecia demonstrated generally consistent therapeutic trends despite differences in study design, treatment duration and drug formulation. Across the reviewed literature, combined therapy was associated with measurable improvement in hair density and overall scalp appearance (Rossi et al., 2023; Asad et al., 2024).

Treatment Efficacy

Several clinical investigations reported that patients treated with combined topical therapy experienced greater increases in hair counts and improved global photographic assessment scores compared with those receiving minoxidil monotherapy (Asad et al., 2024). These findings suggest that simultaneous targeting of follicular stimulation and androgen-mediated follicular miniaturization may enhance therapeutic effectiveness.

Additional observational and comparative studies reported increases in terminal hair density and stabilization of hair loss progression during treatment with the combined regimen (Lubis et al., 2024; Li et al., 2025). Improvements in hair density and clinical scalp appearance were generally observed after 12–24 weeks of treatment, with most studies reporting measurable therapeutic effects by approximately 24 weeks of therapy (Rossi et al., 2023; Asad et al., 2024; Lubis et al., 2024; Abeck et al., 2023; Li et al., 2025).

Mechanistic Considerations

The therapeutic benefit of combined therapy appears to result from complementary pharmacological mechanisms. Finasteride reduces local production of dihydrotestosterone in scalp tissue through inhibition of the enzyme 5- α -reductase, thereby limiting androgen-mediated follicular miniaturization (Rossi et al., 2023). In contrast, minoxidil promotes follicular activity by prolonging the anagen phase of the hair cycle, increasing hair shaft diameter and improving local vascular supply (Abeck et al., 2023).

The reviewed studies used different topical administration strategies. In several investigations, both active substances were incorporated into a single combined topical formulation, typically a hydroalcoholic solution containing both minoxidil and finasteride applied directly to the scalp (Rossi et al., 2023; Li et al., 2025). In other protocols, minoxidil and finasteride were applied separately, with patients first applying the minoxidil solution and subsequently applying topical finasteride to the affected scalp areas (Asad et al., 2024; Lubis et al., 2024).

Application methods were similar across studies. The topical preparation was usually distributed directly onto the scalp using a dropper or spray applicator and gently rubbed into the affected areas, allowing the active substances to penetrate the scalp and reach the hair follicles (Abeck et al., 2023). This localized delivery is intended to maximize therapeutic activity within scalp tissue while minimizing systemic drug absorption.

Safety and Tolerability

The reviewed studies consistently reported favorable tolerability of combined topical therapy. Most adverse effects were mild and localized, including scalp irritation, erythema or pruritus, and were typically transient without requiring discontinuation of treatment (Asad et al., 2024; Lubis et al., 2024).

Different studies investigated topical finasteride at concentrations ranging approximately from 0.1% to 0.25%, usually administered together with 5% topical minoxidil (Rossi et al., 2023; Asad et al., 2024; Li et al., 2025). These concentrations were selected to achieve local inhibition of dihydrotestosterone production while minimizing systemic exposure.

Particularly detailed safety observations were provided by the clinical investigation conducted by Li et al. (2025). In this study, pharmacokinetic monitoring demonstrated that topical administration of finasteride resulted in very low systemic drug concentrations, with only minimal changes in circulating dihydrotestosterone levels compared with baseline values (Li et al., 2025). Importantly, no clinically significant endocrine disturbances or sexual adverse effects were observed during the treatment period (Li et al., 2025).

Similarly, other studies reported extremely low incidence of systemic adverse reactions typically associated with oral finasteride therapy (Rossi et al., 2023). These findings support the hypothesis that topical finasteride may preserve therapeutic efficacy while substantially reducing systemic exposure.

Overall, the available data indicate that combined topical therapy is well tolerated, with adverse events primarily limited to mild local scalp reactions rather than systemic complications.

Summary of Findings

Overall, the analyzed studies suggest that combined topical minoxidil and finasteride therapy may provide greater improvement in hair density and clinical scalp appearance than monotherapy while maintaining a favorable safety profile (Rossi et al., 2023; Asad et al., 2024; Lubis et al., 2024; Li et al., 2025). The available evidence indicates that simultaneous targeting of androgen-mediated follicular damage and stimulation of hair growth represents a rational therapeutic strategy in the management of androgenetic alopecia.

Discussion

The available clinical evidence suggests that combined topical therapy using minoxidil and finasteride may represent an effective therapeutic strategy in the management of androgenetic alopecia. The reviewed studies consistently demonstrated improvements in hair density and overall scalp appearance following combined treatment protocols (Rossi et al., 2023; Asad et al., 2024; Lubis et al., 2024; Li et al., 2025). These findings support the concept that targeting both androgen-mediated follicular miniaturization and stimulation of follicular activity may produce synergistic therapeutic effects.

An important observation emerging from the analyzed studies concerns the time course of therapeutic response. Most investigations reported measurable improvement after approximately 12–24 weeks of treatment, with more pronounced clinical outcomes observed after about six months of therapy (Rossi et al., 2023; Asad et al., 2024). This delayed response is consistent with the physiological duration of the hair growth cycle, particularly the transition from telogen to anagen phase. Consequently, short treatment periods may underestimate the therapeutic potential of topical therapies, and patients should be informed that visible improvement typically requires several months of continuous treatment.

The potential role of adjunctive procedures such as microneedling also merits consideration. Microneedling has been proposed to enhance transdermal drug delivery and stimulate follicular regeneration through controlled dermal microinjury and growth factor release. Previous investigations have suggested that microneedling may enhance the effectiveness of topical minoxidil therapy by improving drug penetration into the scalp. However, the studies included in the present review did not specifically evaluate microneedling in combination with topical finasteride and minoxidil. As a result, the clinical value of incorporating microneedling into combined topical therapy protocols remains uncertain and requires further investigation.

The safety profile of combined topical therapy appears favorable based on the available evidence. Most reported adverse effects were mild and localized, including scalp irritation or erythema (Asad et al., 2024; Lubis et al., 2024). Pharmacokinetic observations also demonstrated minimal systemic exposure following topical administration of finasteride, with only minor changes in circulating dihydrotestosterone concentrations compared with baseline values (Li et al., 2025). These findings support the hypothesis that localized administration may reduce the systemic adverse effects typically associated with oral finasteride therapy.

Nevertheless, interpretation of safety outcomes must take into account the exclusion criteria applied in the analyzed studies. Several trials excluded patients with endocrine disorders, active scalp dermatological diseases, hypersensitivity to study medications, or concurrent hair loss treatments. Consequently, the safety profile observed in the available literature reflects outcomes in relatively selected patient populations. The safety of combined topical therapy in individuals with significant hormonal disorders, dermatological comorbidities, or complex pharmacological treatment regimens therefore remains insufficiently characterized and requires further investigation.

Another factor that may influence long-term treatment adherence is the economic burden associated with chronic therapy. Because androgenetic alopecia requires continuous treatment to maintain therapeutic effects, cumulative treatment costs may become relevant for patients over time. Topical minoxidil formulations are widely available and relatively inexpensive, whereas topical finasteride formulations are frequently obtained through compounded pharmaceutical preparations and may therefore involve higher costs depending on regional availability. None of the reviewed studies evaluated treatment cost or cost-effectiveness, indicating that the economic impact of combined therapy remains insufficiently explored.

Several methodological limitations should also be acknowledged when interpreting the available evidence. The number of studies specifically investigating simultaneous topical finasteride and minoxidil therapy remains limited. In addition, the reviewed studies differ substantially in drug concentration, formulation vehicles, treatment protocols and outcome assessment methods. These differences complicate direct comparison between studies and limit the possibility of performing quantitative meta-analysis. Furthermore, most available investigations evaluated treatment durations of approximately six months, which may not fully reflect long-term therapeutic outcomes or safety during chronic therapy.

Conclusions

Combined topical therapy using minoxidil and finasteride appears to improve hair density and clinical scalp appearance in patients with androgenetic alopecia. By simultaneously targeting androgen-mediated follicular miniaturization and stimulation of hair growth, this therapeutic approach may provide improved clinical outcomes while maintaining a favorable safety profile.

Topical administration of finasteride appears to limit systemic exposure and is generally associated with mild local adverse effects. However, available safety data originate primarily from selected study populations, and additional investigations are required to evaluate safety in broader patient groups.

Future research should focus on larger randomized clinical trials with standardized treatment protocols and longer observation periods. Further studies evaluating adjunctive techniques such as microneedling, long-term safety outcomes and economic aspects of therapy may help clarify the optimal role of combined topical treatment in the management of androgenetic alopecia.

Disclosure: Artificial intelligence tools were used solely as a linguistic aid to improve English language clarity and formatting. The scientific content, literature selection, interpretation of results and final manuscript preparation were performed by the authors.

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REFERENCES

1. Rossi, A., & Caro, G. (2023). Topical finasteride in androgenetic alopecia. *Journal of Cosmetic Dermatology*. <https://doi.org/10.1111/jocd.15953>
2. Asad, N., Naseer, M., & Ghafoor, R. (2024). Efficacy of topical finasteride 0.25% with minoxidil 5% versus topical minoxidil 5% alone in treatment of male pattern androgenic alopecia. *Journal of Drugs in Dermatology*. <https://jddonline.com/articles/efficacy-of-topical-finasteride-025-with-minoxidil-5-versus-topical-minoxidil-5-alone-in-treatment-of-male-pattern-androgenic-alopecia-S1545961624P7826X/>
3. Lubis, F. F., Lagiawati, L., Saulina, M., & Saldi, S. R. F. (2024). Topical finasteride therapy in androgenetic alopecia. *Archives of Dermatological Research*. <https://doi.org/10.1007/s00403-025-04216-9>
4. Abeck, F., Hansen, I., Kött, J., Schröder, F., Garrahy, E., Veneroso, J., Rünger, A., Torster, L., Schneider, S. W., & von Büren, J. (2023). Topical finasteride for androgenetic alopecia: Clinical evaluation. *Journal of Cosmetic Dermatology*. <https://doi.org/10.1111/jocd.16360>
5. Li, Y., Yu, B., Niu, S., Ding, Z., Gu, Q., Zhang, H., Ding, R., Zhou, C., Men, F., Liu, Y., Zhao, W., Chen, L., Li, S., Wang, Q., Xiao, M., Huang, F., Hu, B., Zhang, J., Zhang, J., & Fang, Y. (2025). Pharmacokinetics and safety of topical finasteride in androgenetic alopecia. *Clinical and Experimental Dermatology*. <https://doi.org/10.1080/09546634.2026.2616198>