

# Androgenetic Alopecia in Transgender Men: A Literature Review and Therapeutic Insights

Pedro Augusto Laurindo Igreja Marrafa <sup>1, 2, \*</sup>, Bruno Natal <sup>3</sup>, Fabiana Padovez <sup>4</sup>

<sup>1</sup> Universidade Anhembi Morumbi, Instituto de Engenharia Biomédica, São José dos Campos, SP, Brazil.

<sup>2</sup> Centro de Inovação, Tecnologia e Educação (CITE), São José dos Campos, SP, Brazil.

<sup>3</sup> Bruno Natal Tricologia e Terapia Capilar, Guarulhos, SP, Brazil.

<sup>4</sup> Academia de Tricologia e Estética, São Bernardo do Campo, SP, Brazil.

\* Correspondence: pedro.marrafa@gmail.com.

## Abstract

**Introduction:** An individual who identifies with a gender different from the one assigned to them at birth is called transgender, and in the pursuit of alignment between their identity and body, these individuals often undergo hormonal treatments. The focus of this research is to assess, through literature reviews, a specific side effect of such treatment in transgender man, which is hair loss, referred to here as alopecia.

**Material and Methods:** This article examines hormonal treatment side effects in gender transition, focusing on trichology. Utilizing an exploratory bibliographic approach, the research sourced materials from databases like Web of Science, Cochrane, and Medline.

**Results and Discussions:** Studies on transgender men undergoing testosterone therapy reveal varying percentages of AGA, with evidence suggesting a correlation between AGA incidence and the duration of hormonal treatment. Conflicting findings on predictive factors, including age and testosterone therapy type, complicate the understanding of AGA development. Genetic predisposition and family history also influence the onset of hair loss in transgender men, with those with a family history experiencing it earlier than those without. Overall, AGA in transgender men exhibits complexities influenced by hormonal treatment, genetics, and family history.

**Keywords:** Transgender; Androgenetic Alopecia; Hormone Therapy.

**Citation:** Marrafa PALI, Natal B, Padovez F. Androgenetic Alopecia in Transgender Men: A Literature Review and Therapeutic Insights. Brazilian Journal of Hair Health. 2024;1: bjhh5.

doi: <https://doi.org/10.62742/2965-7911.2024.1.bjhh5>

**Received:** January 22, 2024

**Revised:** February 20, 2024

**Accepted:** February 25, 2024

**Published:** March 7, 2024



**Copyright:** This content is licensed under the terms and conditions of the Creative Commons Attribution 4.0 International License (CC BY).

## 1. Introduction

In 2011, The New England Journal of Medicine garnered attention for being the first major journal in its field to comprehensively address care for transgender individuals. Within it is the article by Gooren [1], highlighting the issue of gender dysphoria as a chronic distress arising from the incongruence between gender identity and the physical phenotype one is born with. To better understand the discussion surrounding this disorder, it is interesting to point to the semiotics surrounding the human body, both in terms of the messages it conveys and how they are interpreted. This is because, in addition to indicating signs of health and illness processes, the human body also emits signals about social relationships [2].

When an individual, whether male or female, identifies with a masculinity/femininity different from the one socially constructed for their sexual phenotype, this person is classified as transgender and falls within a group categorized by the World Health Organization (WHO) as individuals with gender dysphoria [3]. This dysphoria often leads individuals to chronic suffering, as mentioned by Gooren [1]. It is with the aim of escaping such distress that many transgender individuals undergo profound experiences to construct their new bodies. Among

these experiences are the use of hormones and surgical procedures [2]. Over the past decades, surgical procedures have been the primary focus in the gender transition process. Consequently, the study of hormone use for this treatment was marginalized until recent years, as indicated by a 2010 survey that identified only five specific studies on hormone use in gender transition [4].

Among the side effects of hormonal treatment are those related to body hair, as indicated by Seal [5]. In his article, besides noting the growth of beard and body hair in the trunk region, changes from feminine to masculine pubic hair were also observed, along with the onset of hair 'loss' in the temporal/frontal and coronal regions. This 'hair loss' is part of the characteristic miniaturization process observed in cases of Androgenetic Alopecia (AGA), representing a paradoxical mechanism of the effects of testosterone in our body. It is distinguished by the loss of hair in the temporal scalp, midfrontal scalp, or vertex area of the scalp in a horseshoe pattern. The midoccipital region is generally unaffected. Circulating 5 $\alpha$ -dihydrotestosterone (DHT), produced from testosterone by 5 $\alpha$ -reductase, interacts with androgen receptors in hair follicles. DHT causes the miniaturization of scalp hair follicles and shortens the anagen stage, the primary growth phase of hair, leading to a gradual decrease in hair coverage on the scalp. The presence of concomitant nail pitting, scalp itch, or focal hair loss beyond the scalp vertex may indicate the need for dermatology referral. [6-8].

This work aims to identify the effects of hormonal treatment with testosterone in transgender men that may be related to the field of trichology and summarize therapeutic options and suggest first-line treatments for transmasculine patients.

## 2. Material and Methods

This article is centered on examining the side effects of hormonal treatment for gender transition within the realm of trichology. The research methodology employed an exploratory bibliographic approach, sourcing reference materials from books, articles, and theses found in databases such as Web of Science, Cochrane and Medline.

The search focused on terms such as "transgender" and "hair." Initial screening involved the review of titles and abstracts, with subsequent examination of full-text articles that met eligibility criteria. Inclusion criteria encompassed articles providing data on hair changes or treatment in transgender individuals, while abstracts and Trial registry records were excluded. All article titles and abstracts underwent an initial screening for potential inclusion. Full-text assessment occurred when titles and abstracts lacked sufficient information for the application of exclusion and inclusion criteria. The remaining articles underwent a comprehensive evaluation for inclusion.

It is important to note that this article is derived from previously conducted studies and does not introduce new research involving human participants or animals conducted by any of the authors.

## 3. Review and Discussion

### 3.1 Dermatological Conditions in the Transgender Population

Studies in the literature have indicated that testosterone treatment has influenced transgender individuals assigned female at birth (trans AFAB) to develop acne, male pattern hair loss, hirsutism, pseudofolliculitis barbae, and others [9-11].

Testosterone undecanoate appeared to have a greater influence on hair growth than other testosterone regimens [9]. A cross-sectional study among transgender individuals aiming to demonstrate the effects of gender-affirming hormone therapy (GAHT) and gender-affirming procedures on the skin indicated an increase in acne perception from the baseline to 3 after 6 months, decreasing to 2 after 2 years of GAHT. Additionally, the modified Ferriman-Gallwey (mFG) score indicated hypertrichosis in androgen-sensitive areas (HAAs) in all trans men in the study after testosterone treatment [11].

### 3.2 Androgenetic Alopecia in the Transgender Population

While AGA is acknowledged to affect 50% of individuals aged 40 and above, the precise prevalence rate of AGA among transgender individuals remains uncertain [7]. The majority of existing evidence is confined to small sample sizes, predominantly centered around Eurocentric transmasculine individuals, from studies primarily focused on assessing "adverse effects" and dermatological issues related to hormonal treatment for gender reassignment. It often neglects to give proper attention to the broader issue of alopecia as a whole [5, 12-14].

Furthermore, the lack of alignment among study groups in published works complicates the process of identification and characterization, given the divergent information present in the literature. Acknowledging these constraints, during a one-year forward-looking investigation, it was noted that 9 (17%) out of 53 transgender men (with an average age of 25 years) undergoing hormonal therapy with testosterone experienced at least mild androgenetic alopecia (AGA) [13-14]. Another cross-sectional analysis evaluated 50 transmasculine individuals (average age 37 years) who had undergone diverse testosterone treatments for an average duration of 10 years. A majority (63.3%) of transmasculine subjects in this group exhibited varying degrees of androgenetic alopecia (AGA), encompassing 16 participants (32.7%) with solely frontotemporal hairline recession (Hamilton-Norwood II) and 15 participants (31.0%) with substantial AGA (Hamilton-Norwood III or beyond) [13-14].

The variation in percentages among the studied groups may be related to the duration of hormonal treatment that the volunteers underwent. Comparing data from different studies reveals that in the study by Cocchetti et al. [9], the percentage of individuals with Androgenetic Alopecia (AGA) in the first year of treatment is close to the percentages 17% found in the study by Wierckx et al [14]. Notably, the common factor among these studies is a hormonization period of 12 months. However, when examining studies that follow participants over longer periods of hormonal treatment for gender affirmation, there is an observable increase in the number of AGA cases. In the recently published study by Rutnim et al. [11], a 76% incidence of some level of male-pattern hair loss is indicated after 2 years of treatment, with 26.1% of them presenting moderate to severe hair loss (Hamilton-Norwood III-IV). This aligns with the findings of Wierckx et al [13], who identified 63.7% of hair loss, respectively, in transmasculine individuals with over 1 year of hormonal treatment.

These data might suggest that the incidence of androgenetic alopecia (AGA) in transgender men may be related to the duration of hormonal treatment, as suggested by Rutnim et al. [11], who performed a logistic regression analysis, it was noted that in univariate analyses, the occurrence of hair loss in transgender men exhibited a noteworthy correlation with the duration of testosterone treatment (OR: 1.04, 95% CI: 1.01–1.08,  $p = 0.005$ ). Following the adjustment for pertinent confounding variables, the length of testosterone therapy persisted as a foretelling risk factor for the onset of alopecia (OR: 1.05, 95% CI: 1.01–1.09,  $p = 0.016$ ). However, a survey conducted by Motosko and Tosti [15] suggests that the risk of developing androgenetic alopecia likely depends on factors such as the patient's age, being less likely related to the duration or type of testosterone therapy. The same idea had previously been suggested by Wierckx et al. [13-14], who, although finding no association between androgenetic alopecia (AGA) and the duration or subtype of testosterone therapy, a noteworthy correlation with age ( $r = 0.31$ ,  $P = 0.03$ ) was observed. This conflicting information among authors complicates the definition of a predictive factor for the development of alopecia in transgender men.

It is important to highlight that the study conducted by Wierckx et al. [13] demonstrated a significantly lower prevalence of moderate to severe AGA among transmen aged 18 to 50 years (31%) compared to a historical cohort of cisgender men of similar age (42%) [16]. This prevalence difference can be explained by various hypotheses, such the higher average age at the first exposure to elevated testosterone levels may also contribute to differences in the frequency of AGA in transmale [7, 13-14]. Another factor that seems to impact the prevalence of AGA (androgenetic alopecia) in transgender men is genetic predisposition, as can be observed when comparing the onset of hair loss, which becomes noticeable 2 to 5 years after starting testosterone therapy [17]. However, there is a higher incidence in individuals with a family history of AGA. They develop hair loss on average 2.85 years after initiating testosterone therapy, while individuals without a family history of AGA experience hair loss 4.1 years after starting hormonal treatment, according to a small study by Moreno-Arrones, Becerra and Vano-Galvan [18].

### 3.3 Therapeutic Insights

Male pattern hair loss may be a desirable masculine feature for some transgender men, but unwanted by others [17, 19]. For those who are uncomfortable with hair loss, there are already studies exploring alternative treatments based on therapeutic options used to treat AGA in cisgender men. For transgender individuals seeking alopecia treatment, the objective of therapy is to enhance scalp coverage and prevent additional hair thinning. Currently, three first-line treatment options are acknowledged in the literature: Minoxidil Topical, Low-Level Laser Light Therapy (LLLLT), and Finasteride [12, 20].

Minoxidil is a vasodilator and a potassium channel opener that promotes hair growth, prolongs the anagen phase, and enlarges hair follicles. It is believed not to interact with gender-affirming hormone therapy, making it effective for improving hair density on the scalp and beard [21, 22]. The effects of its use at a 5% concentration are already recognized as functional for treating AGA in cisgender men, and recently, a study also indicated its potential application for beard growth in transgender men [23, 24]. The adverse effects of topically applied minoxidil are predominantly dermatological and include scalp irritation, dryness, scaling, itching, and redness. It may also cause allergic contact dermatitis or photoallergic contact dermatitis [25]. It is noted that side effects are less common when using the foam formulation.

LLLLT stands as the sole FDA-approved apparatus for addressing AGA. These tools are crafted with diodes emitting crimson light (630-730 nm) and/or infrared emission. The potential of LLLLТ to stimulate hair growth involves bolstering blood circulation in the scalp, activating follicular stem cells and keratinocytes, and/or alleviating inflammation [26]. In a randomized clinical trial involving 110 men grappling with AGA, individuals utilizing a portable LLLLТ device (655 nm) for 15 minutes, thrice weekly, reported a notably higher surge in mean terminal hair density and an enhancement in their subjective self-evaluation of hair regrowth in contrast to those in the control group employing a simulated device [27]. Consequently, LLLLТ emerges as a secure and efficient therapeutic measure for AGA, and given its external nature, it doesn't manifest any recognized interactions with hormonal treatments.

In a multicenter, randomized, sham device-controlled, double-blind study (n = 269), 26 weeks of LLLТ treatment were sufficient to significantly increase terminal hair density, regardless of gender and age. While this enhancement paralleled short-term experiments using a 5% minoxidil solution and daily administration of 1 mg finasteride, its effectiveness proved to be inferior in prolonged studies [26]. Finasteride can be considered one of the most effective therapies among treatments for AGA in cisgender men [28]. It acts as a competitive inhibitor of 5-alpha reductase, decreasing DHT levels on the scalp and in the serum by 64.1% and 71.4%, respectively, at daily oral doses of 1 mg in cisgender men [29].

Up to now, only one limited prospective cohort study has explored the utilization of finasteride in transgender men. Specifically, 10 transgender men (with an average age of 35 years) starting at stage IV severity on the Hamilton-Norwood scale were monitored for at least one year with a daily oral intake of finasteride at 1 mg. All patients exhibited an improvement of at least one severity grade, and no sexual or physical alterations were observed. However, three patients discontinued the treatment due to financial challenges or dyspepsia. In conclusion, the researchers determined that male-pattern AGA in transgender men shares clinical and therapeutic similarities with male-pattern AGA in cisgender men, and it can be effectively addressed with a daily oral dose of finasteride at 1 mg [18].

In transgender men and individuals of diverse gender identities undergoing testosterone therapy, the cautious recommendation for antiandrogen therapies is essential. This is due to the potential interference with the development of desired secondary sex characteristics, such as a deepened voice, increased body hair, and clitoromegaly. Given that the majority of physical changes manifest within the initial 2 years of hormonal treatment, the initiation of finasteride should be postponed until at least that time. Some authors even suggest that its use should occur only after 5 years of starting hormonal treatment, due to certain changes such as increased muscle mass/strength and body fat redistribution, which may take up to 5 years to fully develop [19, 30].

#### 4. Conclusion

When evaluating information available in academic literature regarding the outcomes of hormonal treatments and cross-referencing them with academic production on alopecias, one can observe traces of Male Androgenetic Alopecia in transgender populations undergoing hormonal treatment, as well as identify potential treatment options.

A more in-depth, specific study of this alopecia becomes intriguing to understand the true impact of gender transition as a triggering factor and to map its development, thereby outlining therapeutic options that either reverse or stabilize it. This confirms the possibility of applying treatments already validated in the literature for the cisgender population. Noting the absence of a nomenclature specific to this condition due to its overshadowing by other research, it is suggested to label it as Transgender Androgenetic Alopecia (TAGA), referencing its characteristics and the demographic it affects.

**Funding:** None.

**Institutional Review Board Statement and/or Informed Consent Statement:** None.

**Acknowledgments:** P. A. L. I. Marrafa acknowledges the Coordination for the Improvement of Higher Education Personnel (CAPES, Brazil) for the Doctorate scholarship – Financing Code 001

**Conflicts of Interest:** None.

## References

1. Gooren LJ. Care of Transsexual Persons. *N Engl J Med*. 2011; 364(13): 1251-1257.
2. Rocon PC et al. (Trans)formações corporais: reflexões sobre saúde e beleza. *Saúde e Sociedade*. 2017; 26(2): 521-532.
3. Popadiuk GS, Oliveira DC, Signorelli MC. A Política Nacional de Saúde Integral de Lésbicas, Gays, Bissexuais e Transgêneros (LGBT) e o acesso ao Processo Transexualizador no Sistema Único de Saúde (SUS): avanços e desafios. *Ciência & saúde coletiva*. 2017; 22(5): 1509-1520.
4. Costa R, Colizzi M. The effect of cross-sex hormonal treatment on gender dysphoria individuals mental health: a systematic review. *Neuropsychiatr Dis Treat*. 2016; 12: 1953-1966.
5. Seal LJ. A review of the physical and metabolic effects of cross-sex hormonal therapy in the treatment of gender dysphoria. *Ann Clin Biochem*. 2016; 53(1): 10-20.
6. Zouboulis CC et al. Sexual hormones in human skin. *Horm Metab Res*. 2007; 39(2): 85–95
7. Otberg N, Shapiro J. Chapter 88. Hair growth disorders. In: Goldsmith LA, Katz SI, Gilchrist BA, et al, editors. *Fitzpatrick's dermatology in general medicine*, 8e. j AccessMedicine j McGraw-Hill Medical. 8th edition. New York: The McGraw-Hill Companies; 2012
8. Bologna JL et al. Alopecias. *Dermatology essentials*. 1st edition. Philadelphia: Saunders; 2014.
9. Cocchetti C et al. Effects of hormonal treatment on dermatological outcome in transgender people: a multicentric prospective study (ENIGI). *J Endocrinol Invest*. 2023; 46: 779-786.
10. Yeung H et al. Dermatologic Conditions in Transgender Populations. *Endocrinol Metab Clin North Am*. 2019; 48(2): 429-440.
11. Rutnin S et al. Characterizing Dermatological Conditions in the Transgender Population: A Cross-Sectional Study. *Transgend Health*. 2023; 8(1): 89-99.
12. Marks DH, Senna MM. Androgenetic Alopecia in Gender Minority Patients. *Dermatol Clin*. 2020; 38(2): 239-247.
13. Wierckx K et al. Short and long-term clinical skin effects of testosterone treatment in trans men. *J Sex Med*. 2014; 11(1): 222-229.
14. Wierckx K et al. Cross-sex hormone therapy in trans persons is safe and effective at short-time follow-up: results from the European network for the investigation of gender incongruence. *J Sex Med*. 2014; 11(8): 1999-2011.
15. Motosko CC, Tosti A. Dermatologic Care of Hair in Transgender Patients: A Systematic Review of Literature. *Dermatol Ther (Heidelb)*. 2021; 11: 1457-1468.
16. Rhodes T et al. Prevalence of male pattern hair loss in 18-49 year old men. *Dermatol Surg*. 1998; 24(12): 1330-1332.
17. Gao Y, Maurer T, Mirmirani P. Understanding and Addressing Hair Disorders in Transgender Individuals. *Am J Clin Dermatol*. 2018; 19: 517-527.
18. Moreno-Arrones OM, Becerra A, Vano-Galvan S. Therapeutic experience with oral finasteride for androgenetic alopecia in female-to-male transgender patients. *Clin Exp Dermatol*. 2017; 42(7): 743-748.
19. Ginsberg BA. Dermatologic care of the transgender patient. *Int J Womens Dermatol* 2016; 3(1): 65-67.
20. Gao JL et al. Androgenetic alopecia in transgender and gender diverse populations: A review of therapeutics. *J Am Acad Dermatol*. 2023; 89(4): 774-783.
21. Lachgar S et al. Minoxidil upregulates the expression of vascular endothelial growth factor in human hair dermal papilla cells. *Br J Dermatol*. 1998; 138(3): 407-711.
22. Li M et al. Minoxidil-induced hair growth is mediated by adenosine in cultured dermal papilla cells: possible involvement of sulfonyleurea receptor 2B as a target of minoxidil. *J Invest Dermatol*. 2001; 117(6): 1594-1600.
23. Kanti V et al. Evidence-based (S3) guideline for the treatment of androgenetic alopecia in women and in men. *J Eur Acad Dermatol Venereol*. 2018; 32(1): 11-22.
24. Pang KC, Nguyen TP, Upreti R. Case Report: Successful Use of Minoxidil to Promote Facial Hair Growth in an Adolescent Transgender Male. *Front. Endocrinol*. 2021; 12:725269.
25. Ebner H, Müller E. Allergic contact dermatitis from minoxidil. *Contact Dermat*. 1995; 32: 316-317.
26. Jimenez JJ et al. Efficacy and safety of a low-level laser device in the treatment of male and female pattern hair loss: a multicenter, randomized, sham device-controlled, double-blind study. *Am J Clin Dermatol*. 2014; 15(2): 115-127.
27. Leavitt M et al. HairMax LaserComb laser phototherapy device in the treatment of male androgenetic alopecia: a randomized, double-blind, sham device-controlled, multicentre trial. *Clin Drug Investig*. 2009; 29(5): 283-292.
28. Adil A, Godwin M. The effectiveness of treatments for androgenetic alopecia: A systematic review and meta-analysis. *J Am Acad Dermatol*. 2017; 77(1), 136-141.
29. Drake L et al. The effects of finasteride on scalp skin and serum androgen levels in men with androgenetic alopecia. *J Am Acad Dermatol*. 1999; 41(4): 550-554.
30. Coleman E et al. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, version 7. *Int J Transgend*. 2012; 13(4): 165-232.