Androgenetic alopecia in transgender and gender diverse populations: A review of therapeutics

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Androgenetic alopecia (AGA) management is a significant clinical and therapeutic challenge for transgender and gender-diverse (TGD) patients. Although gender-affirming hormone therapies affect hair growth, there is little research about AGA in TGD populations. After reviewing the literature on approved treatments, off-label medication usages, and procedures for treating AGA, we present treatment options for AGA in TGD patients. The first-line treatments for any TGD patient include topical minoxidil 5% applied to the scalp once or twice daily, finasteride 1 mg oral daily, and/or low-level laser light therapy. Spironolactone 200 mg daily is also first-line for transfeminine patients. Second-line options include daily oral minoxidil dosed at 1.25 or 2.5 mg for transfeminine and transmasculine patients, respectively. Topical finasteride 0.25% monotherapy or in combination with minoxidil 2% solution are second-line options for transmasculine and transfeminine patients, respectively. Other second-line treatments for any TGD patient include oral dutasteride 0.5 mg daily, platelet-rich plasma, or hair restoration procedures. After 6-12 months of treatment, AGA severity and treatment progress should be assessed via scales not based on sex; eg, the Basic and Specific Classification or the Bouhanna scales. Dermatologists should coordinate care with the patient's primary gender-affirming clinician(s) so that shared knowledge of all medications exists across the care team. (J Am Acad Dermatol 2023;89:774-83.)

Key words: alopecia; androgenetic alopecia; bisexual; dermatology; dutasteride; finasteride; FTM; gay; gender-diverse; gender diversity; gender identity disorder; gender minority; gender queer; general dermatology; hairline advancement; hairline transplantation; hair loss; hair restoration procedure; health disparities; lesbian; LGBT; medical dermatology; minoxidil; MTF; LLLT; LLLLT; low-level laser light therapy; platelet-rich plasma; PRP; sexual minority; transfeminine; transmasculine.

Hair is an essential component of human expression, conveying innumerable aspects of culture and identity, including gender. The impact of hair loss on psychosocial functioning is well established and may be particularly problematic for transgender and gender-diverse (TGD) individuals, given the importance of hair in gender expression.[1-4] Aligning one's physical appearance with societal gender expectations can be integral for social gender affirmation, acceptance, and even safety.[5]

Androgenetic alopecia (AGA) causes hair loss in both cisgender men and women, affecting 50 and 30 million Americans, respectively.[6] Describing hair loss as "male-pattern" or "female-pattern" can be misleading (ie, both sexes may develop either pattern) and stigmatizing, illustrating the importance of nongendered terminology; eg, "patterned hair loss." High levels of dihydrotestosterone (DHT), a potent androgen, contribute to AGA.[7] Masculinizing gender-affirming hormone therapy (GAHT) consists of testosterone, whereas feminizing GAHT consists

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of estrogen or antiandrogens (eg, spironolactone), which has also been used to treat AGA. As both androgens and estrogens can impact hair growth, TGD patients receiving GAHT should have access to individualized AGA treatment when desired.[8,9]

The prevalence of AGA in TGD populations is not well established. Small studies suggest that 32.1%-63.3% of those on testosterone develop AGA.[10-12] A web-based survey (n = 763) found that hair loss was reported significantly more frequently in patients taking testosterone but not for those on feminizing GAHT.[13] Another study (n = 988) found that the proportion of patients with AGA increased after initiating testosterone from 0.4% to 3.1%, which was likely underestimated as only recorded diagnostic codes were counted. Of note, testosterone initiation may trigger AGA years later.[11,14]

Despite a paucity of research about AGA in TGD populations, we summarized the treatment options and suggested dosages for treating AGA in TGD patients based on existing literature (Table I).[15-50] We examined articles studying treatments approved by the United States Food and Drug Administration (FDA), off-label drug use, and procedural treatments for hair loss. We defined treatments as "first-line" if they are well studied, approved by the FDA, safe, and cost effective, and we labeled other treatments as "second-line."

CAPSULE SUMMARY

- Androgenetic alopecia treatment has been well studied in the cisgender population but not in transgender and gender-diverse populations.
- We summarize therapeutic options and suggest first-line treatments for both transmasculine and transfeminine patients.

NONHORMONAL MEDICATIONS

Minoxidil

Minoxidil is a vasodilatory potassium channel opener that promotes hair growth, anagen phase prolongation, and hair follicle enlargement. It is not believed to interact with GAHT.[10]

Topical minoxidil. Topical minoxidil is an FDA-approved, over-the-counter cornerstone of AGA treatment. There is strong evidence for its use as a 5% solution or foam applied twice daily in cisgender men, daily 5% foam for cisgender women, and twice daily 2% solution for cisgender women.[15] Even at the lowest dose (2%), a meta-analysis showed a mean difference of +12.41 hairs/cm^2 compared with a placebo in cisgender women.[16]

Side effects are dose-related, typically involving scalp irritation or contact dermatitis. Facial hypertrichosis, especially with minoxidil 5% solution, was reported in 5% of cisgender women but was rare in cisgender men.[17] Transmasculine patients may view hypertrichosis favorably. Patients should be warned of possible early increased hair shedding.[18]

We suggest minoxidil 5% foam or solution applied to the scalp twice daily for transmasculine patients and once daily for transfeminine patients.

Oral minoxidil. Low-dose oral minoxidil (LDOM) is an off-label treatment for moderate-to-severe AGA. Patients with insufficient benefit from topical minoxidil or those who cannot tolerate, or wish to avoid, topical therapy may prefer LDOM.

No recommended dosage has been established. In cisgender women with AGA, a meta-analysis of 16 studies (n = 622) concluded that minoxidil dosages between 0.25 and 1.25 mg were beneficial and well tolerated. The authors suggested combining minoxidil 0.25 mg with spironolactone 25 mg to limit side effects and reduce fluid retention.[18] This combination, after 1 year, reduced mean Sinclair hair loss and hair shedding scores (n = 100).[19] LDOM 1 mg daily for 24 weeks increased total hair density more than topical minoxidil 5% solution (12% vs 7.2%) but also increased mild hypertrichosis (27% vs 4%).[20] This study should be interpreted with caution as the author reports patents on oral minoxidil.

In cisgender men with AGA, minoxidil dosages between 2.5 and 5 mg were more effective than lower doses.[18,21] At 5 mg daily, 100% of patients showed clinical improvement at 24 weeks and effectivity at the vertex and frontal areas.[22]

A multicenter retrospective study (n = 1404 cisgender men and women) demonstrated that LDOM has a good safety profile.[23] Side effects include dizziness and postural hypotension (Table II).[17-19,21,23,24-27,32-35,38,39,42,46,48,50-52] Hypertrichosis is most common, especially at 5 mg daily, but generally mild and may be less concerning in transmasculine patients, depending on desired gender expression.[18,21,23,51] Patients should be warned about temporary increased hair shedding lasting 3-6 weeks.[18,19]

We suggest oral minoxidil 1.25 mg daily in transfeminine patients to decrease the risk of facial hypertrichosis. For transmasculine patients, we suggest 2.5 mg daily.

Abbreviations used:

AGA:	androgenetic alopecia
DHT:	dihydrotestosterone
FDA:	Food and Drug Administration
FU:	follicular unit
GAHT:	gender-affirming hormone therapy
LDOM:	low-dose oral minoxidil
LLLLT:	low-level laser light therapy
PRP:	platelet-rich plasma
RCT:	randomized controlled trial
TGD:	transgender/gender-diverse

HORMONAL MEDICATIONS

Prior reviews suggest avoiding hormonal medications for AGA in TGD patients, especially antiandrogens in transmasculine patients, until at least 2, or even 5, years after initiating GAHT.[53] While there is no evidence of 5α-reductase inhibitors (eg, finasteride) interfering with serum testosterone levels, effects on desired secondary sex characteristics remain unclear. In our clinical experience, finasteride has not been observed to impact gender affirmation adversely.

Finasteride

Finasteride selectively inhibits the 5α-reductase type II isozyme, stopping testosterone's conversion into DHT in both the scalp and serum.[27,54] It prolongs the anagen phase, stimulating hair growth.

Topical finasteride. Topical finasteride has not been approved by the FDA. Preliminary results are limited, but it may obviate systemic side effects. However, it must be compounded and may be cost prohibitive.

A systematic review examining 7 studies of topical finasteride in cisgender men and women found significant decreases in hair loss rates and increases in total hair, terminal hair, and hair growth. Scalp DHT levels decreased significantly, but serum testosterone did not.[27] In cisgender women (n = 30), 24 weeks of topical finasteride 0.25% admixed with minoxidil 3% solution increased hair density and diameter more than minoxidil 3% solution alone.[28] A systematic review found limited side effects, including scalp irritation (Table II).[27]

We suggest a dosage of 100-200 μL topical finasteride 0.25% solution applied to the scalp daily in both transmasculine and transfeminine patients. Combining this with topical minoxidil can be considered for potentially superior results.

Oral finasteride. Oral finasteride has only been approved by the FDA for treating AGA in cisgender men. Within 1 day, 1 mg of finasteride can reduce serum, prostate, and scalp DHT by over 65%.[54]

In a study of 7 transmasculine patients receiving oral finasteride 1 mg daily for 12 months, all patients improved by 1 grade on the Norwood-Hamilton scale after 5.5 months, on average. No significant adverse effects, serum testosterone changes, or changes in sexual desire occurred. Investigators concluded that M-hairline AGA in transmasculine patients is clinically and therapeutically similar to that in cisgender men.[29] The efficacy of oral finasteride in transfeminine patients is not known.

In cisgender men, a meta-analysis of 20 studies found that 1 mg finasteride daily increased the mean difference in hair count more than low-level laser light therapy (LLLLT), topical minoxidil 5% twice daily, and topical minoxidil 2% twice daily (18.4, 17.7, 14.9, and 8.1 hairs/cm^2, respectively).[16]

Side effects include gynecomastia, which may be undesirable for transmasculine but potentially welcomed by transfeminine patients.[54] Although not studied in TGD patients, oral finasteride may be associated with temporary sexual adverse effects (eg, decreased libido, erectile dysfunction) and severe depression, but a literature review found no definitive link for either and only minimal impact on sexual dysfunction.[30,31] However, recent studies warn of rare psychological adverse events, including suicidality.[32,33] Further research is needed.

Higher doses of finasteride may be considered in transfeminine patients relative to transmasculine patients and have been used anecdotally, although more research is needed.

We suggest prescribing 1 mg once daily in transmasculine and transfeminine patients after counseling about potential side effects and concerns related to gender affirmation. Patients with childbearing potential should be cautioned regarding potential teratogenicity.

Dutasteride

Dutasteride inhibits both 5α-reductase isozymes. It treats benign prostatic hyperplasia but is used off-label to treat AGA. Dutasteride blocks the pilosebaceous unit's type I isozyme more effectively, possibly causing more dramatic feminizing effects. It can be a second-line treatment for mild-to-moderate AGA.[15]

In cisgender men, a qualitative analysis of 4 randomized controlled trials (RCTs) found that dutasteride 0.5 mg daily increases mean hair density compared to placebo.[16] A RCT (n = 416) demonstrated a dose-dependent increase in scalp hair count, decreases in scalp and serum DHT, and increases in testosterone levels. Dutasteride 2.5 mg achieved superior results compared to finasteride 5 mg at 12 and 24 weeks.[34] A meta-analysis of 3

Table I. Suggested dosages for androgenetic alopecia treatment in transgender/gender-diverse patients

Medication	Approved by the FDA for AGA	Suggested dosage		Study quality rating*	Patient cost†	Related articles
		Transmasculine	Transfeminine			
NONHORMONAL						
Minoxidil						
Topical‡§	✓	5% foam or solution, applied to scalp, twice daily		1	$	Kanti et al 2018[15] Adil and Godwin, 2017[16] Dawber and Rundegren 2003[17]
Oral	✗	2.5 mg oral, once daily	1.25 mg oral, once daily	2	$	Randolph and Tosti 2020[18] Sinclair 2018[19] Ramos et al 2020[20] Pirmez and Salas-Callo 2020[21] Panchaprateep and Lueangarun 2020[22] Viñó-Galván et al 2021[23] Jimenez-Cauhe et al 2019[24]
Sublingual‖	✗	0.45 mg sublingual, once daily		4	N/A	Sinclair et al 2020[25]
Intradermal injection‖	✗	2 mL of 0.5% solution injected every 1.5 cm for 10 consecutive wk		1	N/A	Uzel et al 2020[26]
HORMONAL						
Finasteride						
Topical	✗	100 μL or 200 μL of topical finasteride 0.25% solution, applied to scalp, once daily	100 μL or 200 μL of topical finasteride 0.25% solution, applied to scalp, once daily Consider combining with topical minoxidil 2% solution	1	$$	Lee et al 2018[27] Suchonwanit et al 2019[28]
Oral‡	✓	1 mg oral, once daily		1	$	Kanti et al 2018[15] Moreno-Arrones et al, 2017[29] Adil and Godwin, 2017[16] Singh and Avram 2014[30] Pallotti et al 2019[31] Nguyen et al 2020[32] Ho et al 2020[33]
Dutasteride						
Oral	✗	0.5 mg oral, once daily		1	$	Kanti et al 2018[15] Adil and Godwin 2017[16] Olsen et al 2006[34] Zhou et al 2019[35]

Continued

Table I. Cont'd

Medication	Approved by the FDA for AGA	Suggested dosage		Study quality rating*	Patient cost†	Related articles
		Transmasculine	Transfeminine			
Spironolactone						
Oral‡	✗	Not recommended	Up to 200 mg oral, once daily	2	$	Burns et al 2020[36] Sinclair et al 2005[37]
DEVICE						
Low-level laser light therapy‡	✓	Follow the individual device model's guidelines		1	$$$-$$$$	Egger et al 2020[38] Adil and Godwin 2017[16] Jimenez et al 2014[39] Esmat et al 2017[40]
PROCEDURAL						
Platelet-rich plasma	N/A	Prepare using a single-spin centrifugation method. Add an activator (ie, calcium chloride, calcium gluconate) before administering the PRP as subdermal depo bolus injections spaced out in the thinning area. Repeat treatment every month for the first 3 mo, then every 3 or 6 mo for the first year		1	$$$$	Torabi et al 2020[41] Gupta and Carviel 2017[42] Stevens and Khetarpal 2019[43] Qu et al 2019[44] Shah et al 2017[45]
SURGICAL						
Hairline advancement	N/A	Only for congenitally high hairline or round hairline		3	$$$$$	Kabaker and Champagne, 2013[46] Garcia-Rodriguez et al 2020[47]
Hairline transplantation	N/A	Simultaneous forehead reconstruction and hair transplantation		4	$$$$$	Kanti et al 2018[15] Capitán et al 2017[48] Leavitt et al 2005[49] Konior and Simmons 2013[50]

AGA, Androgenetic alopecia; *FDA*, Food and Drug Administration; *N/A*, not applicable.

*Quality rating scheme for studies and other evidence, adapted from *JAMA Dermatology*. *1* = properly powered and conducted randomized clinical trial; systematic review with meta-analysis. *2* = well-designed controlled trial without randomization; prospective comparative cohort trial. *3* = case-control studies; retrospective cohort study. *4* = case series with or without intervention; cross-sectional study. *5* = opinion of respected authorities; case reports.[58]

†Patient cost was estimated based on medication costs available on GoodRx.com and procedural cost ranges published online at the time of this review. *$* <USD 20 per treatment regimen. *$$* <USD 100 per treatment regimen. *$$$* <USD 500 per treatment regimen. *$$$$* <USD 3,000 per treatment regimen. *$$$$$* >USD 3,000 per treatment regimen.

‡Recommended as first-line therapy.

§Only FDA-approved for cisgender men.

‖Not discussed elsewhere in the body of the manuscript, but included here for completeness.

Table II. Associated side effects and considerations for androgenetic alopecia treatment

Medication	Considerations and adverse effects
NONHORMONAL	
Minoxidil	
Topical*	• Scalp irritation/contact dermatitis. If this develops, decrease the dosage. • Facial hypertrichosis. Seen in 5% of ciswomen, but rarely in cismen.[17] Transmasculine patients may view this as a welcome benefit. Transfeminine patients were able to easily manage it. • Hair shedding. Common side effect during the first few months of treatment. It may last 3-6 weeks.[18]

Oral	• Hypertrichosis. Most frequent side effect. Mostly viewed as a mild, easily manageable side effect.[18,23]
	  • Dose-dependent; most common at 5 mg daily.[21]
	  • Usually develops within the first 3 months.[51]
	• Hair shedding. Common side effect during the first few months of treatment.
	  • May last 3-6 wk.[18]
	  • 22 out of 100 cisgender women found this significantly concerning, but it ceased within 4 wk for most and did not cause treatment discontinuation.[19]
	• Well tolerated. Meta-analysis found no reports of severe cardiopulmonary events.[18,23]
	Potential mild cardiopulmonary side effects, including dizziness, postural hypotension (2%), lower limb edema (3%), and mild EKG changes (1%, eg, tachycardia, PVC, or T wave changes in lead 1; only reported in 1 study).[18,19,51]

Sublingual†	• Limited data. Only 1 study.[25]
Intradermal injection†	• Limited data. Only 1 study.[26]
HORMONAL	
Finasteride	
Topical	• Costly. Requires a compounding pharmacy. • Well tolerated.[27] • Decreases scalp dihydrotestosterone.[27] • Scalp irritation/contact dermatitis. Increased alanine aminotransferase levels, pollakiuria, and testicular pain experienced by 2 out of 18 patients. Rarely reported: presyncope, conjunctivitis, headache, oropharyngeal pain.[27]
Oral*	• Suicidality (rare). Counsel patients about the rare but real side effects of suicidality and psychological adverse events.[32] • Gynecomastia. Discuss any patient concerns about potential interference with the gender-affirmation process • Minimal effect on sexual dysfunction (ie, altered libido, erectile dysfunction, ejaculation disorders) • Teratogenic. Discuss potential teratogenicity with all patients who have reproductive potential (ie, a uterus and ovary)
Dutasteride	
Oral	• May be more effective than finasteride.[34] • No significant difference in safety profile, including sexual dysfunction, compared to finasteride.[35] • Limited data. More studies are needed.
Spironolactone	
Oral*	• Gynecomastia.[52] Avoid in transmasculine patients. Transfeminine patients may view this as a welcome benefit. • Postural hypotension. • Hyperkalemia. • Caution in patients with renal insufficiency.
DEVICE	

Low-level laser light therapy*	• Well tolerated. No serious adverse events.
	• Industry-related studies. As some studies have a relationship with industry, interpret results cautiously.
	• Minor side effects, mostly resolving within 2 weeks.[38,39]
	  • Dry skin (5.1%)
	  • Pruritus (2.5%)
	  • Scalp tenderness (1.3%)
	  • Irritation (1.3%)
	  • Warm sensation at site (1.3%)

Continued

Table II. Cont'd

Medication	Considerations and adverse effects
PROCEDURAL	
Platelet-rich plasma	• Costly. Out-of-pocket expenditure. The first 3 sessions alone can cost $1,500-$3,000 • Well tolerated. Only minor side effects (ie, erythema, edema, headache, drowsiness, mild pain, temporary swelling, scalp sensitivity).[42]
SURGICAL	
Hairline advancement	• Costly • Potentially visible scar line or excessively short forehead.[48] • May need scalp expansion (prolonged deformity and extra cost).[46]
Hairline transplantation	• Costly • Single procedure affectively addresses concerns. May need a second session if an extensive surface needs to be covered.[51] • Avoid in patients with body dysmorphic disorder or unrealistic expectations.[50]

EKG, Electrocardiogram.
*Recommended as first-line therapy.
†Not discussed elsewhere in the body of the manuscript, but included here for completeness.

articles (n = 576) also found that dutasteride (0.5 or 2.5 mg) was more effective than finasteride based on mean change in total hair count, photographic assessments, and subjects' assessments (Supplemental Table 1; available via Mendeley at https://data.mendeley.com/datasets/mzh2z8zt53/2.) There was no significant difference in safety profile, including sexual dysfunction.[35]

We suggest a dosage of 0.5 mg once daily in transmasculine and transfeminine patients in whom finasteride failed.

Estrogens

The role of estrogen in scalp hair growth is complex and understudied in TGD populations. As it is primarily used as GAHT and not as AGA treatment, it will not be discussed further.[8]

Spironolactone

Spironolactone, which is antiandrogenic at higher doses, is primarily used as feminizing GAHT in transfeminine patients. Spironolactone should generally be avoided in transmasculine patients as it may reduce testosterone levels and/or cause gynecomastia, though this may benefit transfeminine patients.[52] It is also widely used off-label as AGA treatment (up to 200 mg/day) and can arrest AGA progression in over 90% of cisgender women.[19,36,37] The side effects include postural hypotension and hyperkalemia. It should be approached with caution in renal insufficiency.

We suggest a dosage of up to 200 mg once daily in transfeminine patients. Avoid using this for transmasculine patients.

Clascoteronone

Clascoteronone solution is a topical antiandrogen in phase II trials for AGA treatment in cisgender women and may be a future option for avoiding systemic interactions with GAHT.

LLLLT

LLLLT is the only FDA-approved device for treating AGA. These can be in-salon hoods, overhead panels, caps, or hand-held devices consisting of diodes emitting red light (630-730 nm) and/or infrared radiation. LLLLT may promote hair growth by increasing scalp blood flow, stimulating follicular stem cells and keratinocytes, and/or resolving inflammation.[39] Device prices range from $395 to $2999. Patients might be able to use flexible spending or health savings accounts to purchase them.

LLLLT has been beneficial as AGA treatment in both cisgender males and females.[16,38,39] A review summarizing 10 RCTs of LLLLT devices (600-665 ± 10 nm) used for 16 weeks or longer found significantly increased hair diameter, hair density, terminal hair counts, hair growth, and hair coverage in both sexes.[38]

Treatment regimens range by device and study protocols, with sessions ranging from 8-30 minutes with varying frequencies (eg, daily, every other day, etc).[38]

In a multicenter, randomized, sham device-controlled, double-blind study (n = 269), 26 weeks of HairMax LaserComb (Hairmax) treatment significantly increased terminal hair density independent of sex, age, and LaserComb model delivering similar laser dose rates. Although this increase was comparable to short-term trials of minoxidil 5% solution and finasteride 1 mg daily, it was less efficacious than longer term trials.[39]

An RCT (n = 45 cisgender women) found that combining LLLLT with topical minoxidil 5% twice

daily for 4 months was more effective than either monotherapy for both Ludwig scale improvement and patient satisfaction.[40] As some studies report relationships with industry, cautious interpretation of results is advisable.[38] Only minor adverse effects (eg, dry skin, pruritus) have been reported. Most resolved within 2 weeks (Table II).[38,39] LLLLT has not been approved by the FDA for individuals with Fitzpatrick skin types V/VI, thus the efficacy is not known in these populations.[55]

We suggest following each LLLLT device model's instructions for hair loss treatment as regimens vary across devices.

PLATELET-RICH PLASMA (PRP)

Concentrated autologous platelet-rich plasma (PRP), which contains platelet-derived, insulin-like, epidermal, and other growth factors, can promote hair regeneration. Although no studies have evaluated PRP in TGD individuals, systematic reviews of PRP in cisgender patients have demonstrated regrowth, improved hair density, and increased quality of life.[41-43] A RCT (n = 93) found significantly improved hair density, hair thickness, hair pull tests, scalp inflammation, and oil secretion in all stages of AGA after 6 monthly PRP injections, especially in patients with less-severe alopecia.[44] Using both PRP and topical minoxidil 5% also significantly improved AGA compared to topical minoxidil 5% alone (n = 50).[45]

However, the recommended quantity and frequency of treatments is unclear. In 1 meta-analysis, the study with the largest standardized mean difference used 3 PRP treatments at 21-day intervals, whereas the lowest difference was seen with 4 treatments at 3-6—week intervals.[42] There is lack of standardization of PRP preparation, dosages, number, frequency, and injection techniques. PRP treatment is well tolerated, with minor side effects, including erythema, edema, and headache (Table II).[42] However, PRP may be cost prohibitive as an out-of-pocket expense.

We suggest the same PRP regimen for TGD patients as cisgender patients. Suggested guidelines include 3 monthly injections followed by injections every 3-6 months for the first year.[43]

HAIRLINE ADVANCEMENT

Hairline advancement is an operation for decreasing forehead height, usually for congenitally high hairlines.[46] It can shorten foreheads by 2.0 cm on average and rounds hairlines for a more "feminine" aesthetic in transfeminine patients.[47] The procedure is relatively brief, around 1.5 hours, and moves approximately 3000 follicular units (FU) at once. For high hairlines with minimal laxity, a more-expensive 2-stage procedure involving scalp expansion before advancement can move 12,000 FUs. Both procedures have excellent overall patient satisfaction.[46] Potential adverse effects include a visible scar line and/or excessively short forehead.[48] Trichophytic incisions are key for camouflaging scars.[46]

HAIR TRANSPLANTATION

Hair transplantation is a long-term solution for severe AGA. This transplants FUs of 1-4 hairs in large numbers and high densities.[15] A study of 65 transfeminine patients demonstrated that frontonaso-orbital complex, or forehead, reconstruction with simultaneous hair transplantation in one comprehensive operation was effective with adequate FU density a year post surgery. Nine (14%) patients were candidates for a second transplant session due to extensive surfaces needing coverage.[48]

In cisgender men, a study found combining FU transplantation with oral finasteride 1 mg daily (and/or topical minoxidil) starting from 4 weeks before until 48 weeks after transplantation offered better clinical outcomes, improved surrounding scalp hair, increased hair density, and decreased postoperative AGA progression.[49]

Many cases require more than one surgical session, though we suggest combining forehead reconstruction and hair transplantation into a single operation to meet the needs of TGD patients efficiently. Final results should be evaluated at 9-12 months.

DISCUSSION

More clinical studies examining AGA therapeutics specifically in TGD populations are needed, with particular focus on dosages and effects on gender affirmation. Clinicians should understand the impact of GAHT on hair loss and tailor treatment to the individual needs of TGD patients. AGA severity and treatment progress should be assessed after 6-12 months of treatment via scales not based on sex; eg, the Basic and Specific Classification or the Bouhanna scales.[56,57] Dermatologists should coordinate care with their patient's primary gender-affirming clinician(s) so that shared knowledge of all medications exists across the care team.

First-line treatments for either transmasculine or transfeminine patients include topical minoxidil, oral finasteride, and/or LLLLT. Oral spironolactone is also first-line for transfeminine patients. Second-line treatments for either include oral dutasteride, PRP,

hair restoration procedures, oral minoxidil, or topical finasteride.

Conflicts of interest

None disclosed.

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