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# Finasteride for Hair Loss in Women

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## More new tricks with old drugs: finasteride for hair loss in women.

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The purpose of DPIC's Drug Information Service is to provide information to help pharmacists and other healthcare professionals provide safe and rational drug therapy. DPIC was recently asked to clarify the use of finasteride for hair loss in women.

## Background

Hair loss can be distressing for the female patient, with women being twice as likely as men to be very-to-extremely upset and up to 70% of women reporting high levels of distress over their hair loss.<sup>1,2</sup> Although there are various types and etiologies of hair loss in women, the most common form is female pattern hair loss (sometimes called androgenetic alopecia), which is estimated to affect 21 million women in the US and accounts for more than 65% of hair loss in women.<sup>1</sup> It can develop any time after puberty, and prevalence increases with age.<sup>3</sup> Female pattern hair loss is somewhat analogous to male pattern hair loss with similar follicular changes, but a different distribution of hair loss.<sup>3,4</sup> While men typically experience central thinning with frontal and temporal recession (Hamilton patterns), women typically experience diffuse central thinning with preservation of the frontal hairline (Ludwig patterns), or thinning with frontal accentuation ("Christmas tree" patterns). Hamilton patterns of hair loss are also be seen in women, but infrequently.<sup>1,4,5</sup> The role of androgens (testosterone and dihydrotestosterone) in male pattern hair loss is clear, but the role of androgens in female pattern hair loss remains obscure, as many women with female pattern hair loss do not have elevated serum testosterone levels or clinical signs of hyperandrogenism. Nevertheless, antiandrogen therapy with various agents, such as androgen receptor blockers like cyproterone acetate and spironolactone, has been used with some success in women.

## Antiandrogen therapy with finasteride

Type II 5 $\alpha$ -reductase is an enzyme, found predominantly in the prostate gland and in hair

follicles, that converts testosterone to the more potent dihydrotestosterone.<sup>6</sup> Finasteride inhibits type II 5 $\alpha$ -reductase, which reduces the formation of dihydrotestosterone and decreases the biological action of testosterone at target tissues. Finasteride was first licensed at a dose of 5 mg/day in 1992 for the treatment of benign prostatic hypertrophy in men. In 1998 finasteride was licensed at a dose of 1 mg/day (as Propecia®) for the treatment for male pattern hair loss in men. Long-term treatment with finasteride has been shown to stabilize hair loss in ~90% of men and increase hair growth in one-half to two-thirds of men.<sup>7,8</sup> The use of finasteride for female pattern hair loss, however, is controversial.

### **Finasteride for female pattern hair loss**

The earliest and largest report of finasteride for female pattern hair loss was a double-blind, randomized controlled trial involving post-menopausal women aged 41 to 60 years with normal serum testosterone. Patients were randomized to finasteride 1 mg daily (n=67) or placebo (n=70) for 12 months. Outcome measures included periodic computer-assisted hair counts, patient self-assessments including satisfaction with overall hair appearance, investigator assessment of hair growth compared to baseline, and global photographic assessment. Serial biopsies of the scalp in areas of hair thinning were also used to determine the effect of finasteride on hair growth. After 12 months of treatment, finasteride was no better than placebo in any of the outcome measures despite significant reductions in serum dihydrotestosterone levels, and fewer than 20% of treated patients reported satisfaction with the appearance of their hair. Treatment was generally well-tolerated with no significant differences in clinical or laboratory adverse events between finasteride and placebo, although one patient in the finasteride group developed folliculitis, which resolved with continued treatment.<sup>9,10</sup>

The authors postulated that the lack of effect could have been due to age-related hair thinning in some patients, which would not be expected to respond to finasteride treatment. However, successful treatment was subsequently reported in other post-menopausal women, albeit sometimes with higher doses over longer treatment periods.

A 67 year-old woman with an 18-month history of progressive hair thinning and no laboratory evidence of hyperandrogenism was unable to tolerate antiandrogen therapy with spironolactone 100 mg/d, and a switch to cyproterone 50 mg was ineffective. Finasteride 5 mg once weekly was started and after 12 months the patient reported increased hair density and standardized global photography of her scalp showed significant hair regrowth.<sup>11</sup>

Similar results were reported in a 51 year-old patient with an 8-month history of progressive hair thinning and no laboratory or clinical evidence of hyperandrogenism. Treatment with topical minoxidil 2% had no effect. Finasteride 1 mg daily was started, hair loss stabilized after 8 months and hair density improved compared to baseline after 12-13 months.<sup>12</sup> Trueb reported slowing of hair loss and noticeable hair regrowth in as little as 6 months in 5 normoandrogenic, post-menopausal women using finasteride in doses of 2.5 mg or 5 mg daily. Four out of 5 of these patients had previously tried antiandrogen therapy with cyproterone without success.<sup>13</sup> Ahn et al reported satisfaction by patient self assessment and improvement by photo assessment in 9 out of 10 post-menopausal women treated with finasteride 1 mg daily for 52 to 82 weeks.<sup>14</sup> Finally, 5 out of 6 women with alopecia and normal serum testosterone levels (average age 46.5 years, range 30 to 76 years) reported benefit and psychological improvement with finasteride 5 mg daily in retrospective questionnaires.<sup>15</sup>

Pre-menopausal women have also been studied. Iorizzo et al reported improvement in 23 of 37 pre-menopausal women, based on global photographic assessment in a 12-month open-label trial of finasteride 2.5 mg daily (along with an oral contraceptive containing drospirinone). Twenty-nine of the patients reported improvement by self-assessment.<sup>16</sup>

It has been suggested that women with hyperandrogenism might be more likely to benefit from finasteride treatment.<sup>17</sup> However, finasteride has yielded inconsistent results in both pre- and post-menopausal women with female pattern hair loss associated with overt hyperandrogenism.

Combined treatment with finasteride 2.5 mg/d and ethinyl estradiol 30 ug/d for 2 years was reported to improve hair loss in 75 of 89 patients with persistent adrenarche syndrome (manifested by seborrhea, acne, hirsutism and alopecia).<sup>6</sup> The same investigators also reported success with finasteride 2.5 to 5 mg/d plus topical minoxidil in post-menopausal women with elevated androgen levels and either Ludwig or Hamilton pattern hair loss.<sup>18</sup>

Finasteride 1.25 mg daily was effective in promoting scalp hair growth in 4 women (aged 36, 40, 60, and 66 years old) with elevated serum testosterone levels (range 3.4 to 5.8 nmol/L) and clinical hyperandrogenism. Stabilization of hair loss was seen within 6 to 12 months, but noticeable hair growth took from 6 months to as long as 2.5 years. Other features of hyperandrogenism such as hirsutism also improved. Patients were still on treatment after 24 to 30 months.<sup>19</sup>

Finasteride 2.5 mg daily was also effective in stabilizing hair loss and promoting hair regrowth in a case of a 47-year-old woman who developed male pattern hair loss due to long-term treatment with an estrogen-testosterone combination following hysterectomy and ovary removal. Despite continued treatment with testosterone, hair loss stabilized after 6 months, and there was noticeable improvement of scalp coverage by 10 months. Other features of hyperandrogenism (hirsutism and deepened voice) also improved.<sup>20</sup>

In contrast, finasteride 5 mg daily (n=12) for 1 year was no different from no treatment (n=12), and less effective than flutamide 250 mg/d (n=12), based on patient self-assessment and investigator assessment, in young women (25±2 years old) with Ludwig pattern hair loss, elevated serum testosterone and clinical hyperandrogenism.<sup>21</sup>

### **What about topical finasteride?**

Only 2 studies evaluating topical finasteride for pattern hair loss were found, and only 1 study involved women.<sup>22,23</sup> Finasteride 0.005% (in a base of ethanol, propylene glycol, and water) was studied in 52 patients with androgenetic alopecia, including 24 women (mean age 33 years, range 23-38years) in a 16-month single-blind, placebo-controlled trial.<sup>22</sup> Treatment consisted of 1 mL of solution applied twice daily to balding areas. There was no response to treatment in the first 3 months, however, by 6 months there were statistically significant differences in hair density and hair loss compared to placebo. Although the results were not stratified by sex, by the end of the study all treated patients had slight to marked reduction of balding areas and all reported perceived benefit, rating their treatment moderately (27%) or highly effective (73%). Treatment was well-tolerated with no report of local or systemic side effects, and no effect on plasma testosterone or dihydrotestosterone were observed.

### **Conclusion**

There have been recent advances in the understanding of hair follicle physiology and the role

of androgens in human hair growth, but much remains unclear.<sup>24</sup> The role of finasteride in female pattern hair loss is still controversial, with reports of success and occasionally failure continuing to appear. Some women with female pattern hair loss might benefit from finasteride, although better understanding of the condition and more research into optimal finasteride dosing and who might be good candidates for treatment is needed.<sup>17,25</sup> Doses used have ranged from 5 mg per week to 5 mg per day, over periods of 6 months to more than 2 years. Finasteride was well tolerated in the various doses used with few treatment-related adverse effects reported. The main caution is that finasteride can cause feminization of male fetuses, so pregnancy must be excluded before beginning finasteride and women of reproductive age must use effective birth control while taking finasteride.

## Key points

- It is not clear who is likely to respond to therapy.
- Optimal dosing in women is unknown; higher doses than in men may be necessary.
- Noticeable results may take 6 months or longer, and like men, effects are not sustained without continued treatment.
- Women of child-bearing age should not use finasteride, or must use effective contraception during treatment.

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