

Finasteride for the Treatment of Hidradenitis Suppurativa in Children and Adolescents

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Importance: Hidradenitis suppurativa (HS) is a chronic debilitating cutaneous disease for which there is no universally effective treatment. Patients typically present at puberty with tender subcutaneous nodules that can progress to dermal abscess formation. Antiandrogens have been used in the treatment of HS, and studies have primarily focused on adult patients.

Observations: We present a case series of 3 pediatric patients with HS who were successfully treated with oral finasteride, resulting in decreased frequency and sever-

ity of disease flares with no significant adverse effects.

Conclusions and Relevance: Finasteride is a therapeutic option that provides benefit for pediatric patients with HS. Further prospective data and randomized controlled studies will provide helpful information in the management of this disease.

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HIDRADENITIS SUPPURATIVA (HS) is a chronic inflammatory disease that primarily involves skin in the axillae, groin, and anogenital regions, although disease may extend to the buttocks, chest, scalp, eyelids, and retroauricular areas.¹ Patients with HS develop exquisitely painful erythematous subcutaneous nodules that may heal spontaneously or suppurate and coalesce to form dermal abscesses. There may be subsequent sinus tract formation and severe scarring. Typically, disease onset occurs in the second or third decade of life.² Although HS may be seen in prepubertal patients,²⁻⁵ fewer than 2% of cases occur before the age of 11 years.² Patients with HS often report a significant negative effect on quality of life, due not only to physical symptoms but also to social stigma associated with the disease.⁶ Although multiple medical treatments exist, including antimicrobials, immunosuppressants, and hormonal, laser, and surgical therapies, no single treatment modality has been found to be universally effective.⁷ Antiandrogenic medications are among those used to treat HS, but, to our knowledge, there are no published pediatric case series regarding the use of this treatment. We would like to highlight the use of finasteride as another potential therapy for HS in children; finasteride is an antiandrogen with a mechanism of action different

from that of cyproterone acetate, a previously studied antiandrogen in patients with HS. We outline findings in 3 cases presenting during childhood, all in patients who showed significant improvement in disease activity with finasteride treatment.

REPORT OF CASES

PATIENT 1

A 6-year-old girl presented with precocious puberty. She developed painful inflamed nodules in the groin at 7 years. During the subsequent year, she had an increase in the number and size of these lesions. She was initially treated by her community physician with topical and oral antibiotics with no success. She also had been taking a 4-month course of isotretinoin, which did not improve her HS lesions. At the time she presented to us at age 13 years, she had extensive lesions consistent with HS in the groin and axillae. There were large, tender, inflamed nodules extending to the perianal, perineal regions, and inner thighs. Surgical resection of tissue from the left axilla was explored as an option for extensive axillary disease, but ultimately the surgical team suggested to pursue medical management. She continued to develop extensive lesions in the axillae, flanks, groin, and

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inner thighs. She was started on oral minocycline with no significant improvement. Two months later, she was given oral Marvelon (ethinyl estradiol, 0.03 mg, and desogestrel, 0.15 mg, on menstrual cycle days 1 through 21). Six months later, there was mild to moderate improvement, and oral spironolactone was added to augment her therapy. At 13½ years of age, she continued to have further flares, requiring oral cephalexin on 2 occasions. At age 14 years, she had a significant flare-up in the axillae, groin, lower abdomen, and inner thighs, requiring a 6-week course of oral cephalexin. She was experiencing considerable emotional distress as a result of her skin disease. She commenced photodynamic therapy at age 14½ years, and minocycline was switched to tetracycline hydrochloride, in addition to spironolactone, and oral contraceptive (OC). She underwent amino levulinic acid photodynamic therapy (ALA-PDL) monthly. Initially, there was minimal improvement with ALA-PDL. At 15¼ years, spironolactone was stopped and finasteride, 5 mg/d, was started and increased 3 months later to 10 mg/d. In conjunction with ALA-PDL and OCs, escalation of finasteride to 10 mg/d resulted in clinical improvement with reduction in frequency and severity of flares. Oral tetracycline hydrochloride was stopped 6 months after maximum finasteride dose was achieved. During the next 3 years, she had only 3 flares, each of which were treated successfully with brief courses of oral cephalexin. She has currently been receiving this treatment for 6 years.

PATIENT 2

A 15-year-old girl with polycystic ovary syndrome, diagnosed 1 month prior, presented with a 1-year history of severe HS lesions in the groin region and on the posterior part of the neck, requiring surgical drainage and intravenous antibiotics. She continued to have flares during treatment with isotretinoin and an OC, which were started within 2 months of presentation. During the next 6 weeks, she had 2 significant flares, one of which required hospitalization for intravenous antibiotics. Oral erythromycin estolate was given in combination with OCs and isotretinoin. However, the flares persisted for the next month. Isotretinoin was stopped at age 15½ years due to poor response to treatment, and oral finasteride, 5 mg/d, was started at that time, in addition to oral erythromycin and OC. With this therapeutic combination, the patient's disease flares have decreased in frequency and severity during the next 2½ years at this writing.

PATIENT 3

A 7-year-old girl presented with a 1-year history of perianal, inner thigh, and axillary disease (**Figure 1** and **Figure 2**) consisting of painful nodules that would occur every few weeks to months. A biopsy showed inflamed cysts, and she was treated with oral erythromycin for 2 months with no improvement in her condition. The patient was unable to attend school because of pain and her inability to sit for a protracted time. Erythromycin was stopped, and she was treated with a combination of topical clindamycin phosphate



Figure 1. At initial presentation, patient 3 had multiple inflammatory erythematous nodules on both inner thighs.



Figure 2. Patient 3 had tender erythematous nodules in the perianal region at presentation.

(1%) and benzoyl peroxide (5%) gel, oral trimethoprim, and oral finasteride, 1.25 mg/d. After 9 weeks of receiving this treatment regimen, there was minimal improvement, so topical silver sulfadiazine was recommended and the finasteride dose was increased to 2.5 mg/d. Three months later, the finasteride dose was increased to 5 mg/d because she continued to see new inflammatory lesions in addition to comedones. Topical adapalene, 0.3% daily, was used as needed for comedones, and trimethoprim dose was increased slightly. At 9 years of age, she noted significant improvement in symptoms and very rare need for topical antibiotics, so her trimethoprim dose was decreased and she continued receiving finasteride, 5 mg/d. She reported only rare need for topical adapalene. She has since continued oral trimethoprim and finasteride, as well as topical clindamycin phosphate (1% wipes) to the groin and axillae if she has heavy perspiration with physical activity. After 1 year of oral trimethoprim and an escalating dose of finasteride (up to 5 mg/d), the patient's condition showed remarkable improvement, with minimal flares (**Figure 3** and **Figure 4**). She has continued to receive this treatment for a total of 3 years.



Figure 3. After 3 years of finasteride therapy, patient 3 showed significant resolution of active disease, with a decrease in inflammatory nodules and residual scarring and dyspigmentation on the inner thighs.



Figure 4. Patient 3 had residual scarring and dyspigmentation in the perianal area after 3 years of finasteride therapy.

COMMENT

For many years, androgens have been suggested as a causative or contributing factor for HS. Initial studies demonstrated that female patients with HS had higher concentrations of plasma testosterone and a higher free androgen index than control participants, suggesting that androgens play a role in the pathophysiology of this condition.⁸ A subsequent study challenged these findings by examining androgen levels in female patients with HS and controls matched for weight and hirsutism. This study found no difference in plasma testosterone or dehydroepiandrosterone levels between patients and controls.⁹ Nevertheless, clinical experience with antiandrogens has yielded positive results in some studies. In a randomized controlled trial comparing treatment with ethinyl estradiol (50 μ g) and either cyproterone acetate (50 mg) or norgestrel (500 μ g) in 24 female patients, significant improvement in disease activity was shown for both treatment groups.¹⁰ Other case series have also shown therapeutic benefit for antiandrogens in some patients with HS.¹¹⁻¹³

Finasteride is a competitive inhibitor of the type II 5 α -reductase enzyme, which converts testosterone to dihydrotestosterone, resulting in decreased serum dihydro-

testosterone levels. Type II 5 α -reductase is found in hair follicles, whereas type I 5 α -reductase is present in both hair follicles and apocrine glands.¹⁴ Although HS has historically been considered a disease of the apocrine glands, there is some evidence that its primary mechanism is inflammation of the terminal follicular epithelium with apocrine involvement as a secondary phenomenon.^{15,16} Accordingly, inhibition of 5 α -reductase could improve symptoms of HS by reducing local concentrations of dihydrotestosterone at the level of the hair follicles. This would explain why other antiandrogens that act by blocking dihydrotestosterone at the receptor level more globally, such as cyproterone acetate, have not been shown to be universally effective.

Finasteride is typically used in male patients to treat androgenic alopecia¹⁷ or benign prostatic hyperplasia¹⁸ and less commonly in female patients with hirsutism.¹⁹ The major safety issues with finasteride include its potential to cause feminization of the male fetus in women of reproductive age²⁰ and an association between daily finasteride use and increased risk of high-grade prostate cancer in men older than 50 years. In a retrospective pediatric study of male patients with androgenetic alopecia treated with oral finasteride for 6 months to 8 years, the only adverse effect noted was transient sexual dysfunction.²¹ Our patients were treated with finasteride in combination with OCs and/or oral antibiotics. However, there have been 2 reports of successful treatment of severe HS with finasteride as monotherapy in adults.^{12,22} One case series of 7 patients treated with finasteride (5 mg/d) for disease not responsive to antibiotics demonstrated significant improvement in 6 or 7 patients and prolonged remission in 2.¹² Adverse effects noted in that study included generalized pruritus that resolved with cessation of treatment in 1 male patient and breast enlargement and premenstrual tenderness in 2 female patients, 1 of whom experienced this effect for a year.¹²

To our knowledge, no long-term safety studies for finasteride have been performed in the pediatric population. Studies in adults examining the effects of finasteride on sperm count and motility showed no significant effect after 1 year of treatment,²³ but there have been a few case reports of reversible negative effects on spermatogenesis and 2 reports of an association with infertility.^{24,25} Currently, finasteride is categorized as pregnancy category X²⁶ and contraindicated in female patients of childbearing age owing to the risk of feminization of a male fetus. Therefore, decisions to use this medication in female patients should be carefully considered, and the risks should be clearly communicated to patients. Addition of OCs may be a suitable therapeutic strategy for patients of childbearing age.

Our initial experience and findings suggest that finasteride may be a suitable additive therapy for refractory cases of HS. We propose that finasteride be considered in patients with HS for whom topical or oral antibiotics have not yielded adequate improvement and before intervention with surgical or biologic therapies. In the absence of long-term safety data in children and adolescents, we recommend judicious use of finasteride, with clear communication regarding risks and ben-

efits; adjunctive use of OC therapy should be considered in menstruating female patients.

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