

BRIEF REPORT

Improvement of alopecia areata with Dupilumab in a patient with severe atopic dermatitis and review the literature

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ABSTRACT

Dupilumab, a biologic drug approved for the treatment of moderate-to-severe atopic dermatitis, has been associated with resolution or improvement in pre-existing alopecia areata. We report a case of significant improvement of AA after Dupilumab-onset treatment for atopic dermatitis and review the literature.

Key words: alopecia areata, dupilumab, treatment.

INTRODUCTION

Dupilumab is the first targeted biologic drug approved for the treatment of moderate-to-severe atopic dermatitis not adequately controlled with other therapies. Dupilumab inhibits interleukin (IL)-4 and IL-13 receptor, related with T helper (Th)2 immune response.¹ Atopic dermatitis is commonly associated with other chronic inflammatory or autoimmune conditions, like alopecia areata (AA), a non-cicatricial alopecia that is postulated to be a hair-specific autoimmune disease. Although the evidence supports the involvement of a Th1-mediated immune response in the pathogenesis of AA, polymorphisms in IL-4 and IL13 have recently been discovered in these patients. An increased expression of genes



Figure 1 Alopecia areata in patches before treatment.

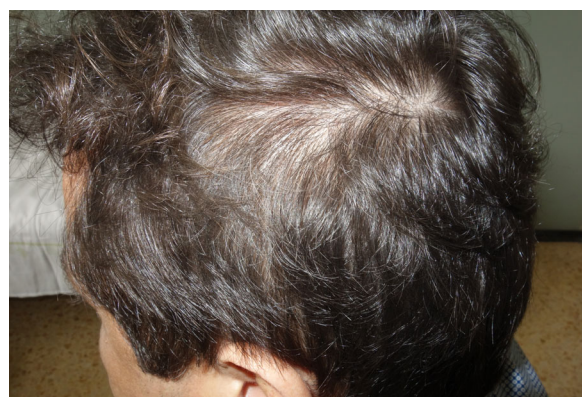


Figure 2 Hair regrowth after 3 months into therapy with dupilumab.

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related to the Th2 response has been observed in skin biopsies from patients with AA.² In addition, some cases of hair growth in patients with AA after dupilumab treatment have been reported.

MAIN TEXT

A 49-year-old man with a 20-year history of adult-onset atopic dermatitis consulted at our department. He had undergone several treatments with partial to no improvement, including oral corticosteroids, phototherapy, azathioprine and cyclosporine, which had to be suspended due to hypertension and hypertriglyceridemia. Throughout his illness, the patient has required several hospital admissions due to erythroderma. In addition to atopic dermatitis, he had a 4-year history of AA presenting with focal well-

circumscribed patches of hair loss on parietal and occipital areas (Fig. 1). Eyebrows, eyelashes and beard were spared. He had only received topical corticosteroids as treatment for his AA. The patient had received subcutaneous methotrexate 10 mg weekly for the last 7 years, with partial improvement of atopic dermatitis but no effect on his AA. Concomitant therapy with dupilumab was started, with an initial dose of 600 mg followed by 300 mg every 2 weeks. Upon the 3-month follow-up visit, a total regrowth of his AA was observed (Fig. 2).

CONCLUSION

The relationship between dupilumab and alopecia areata is controversial. There are 7 reports of 8 patients experiencing improvement of AA after starting treatment with

Table 1 Reported cases that show improvement of alopecia areata after starting treatment with dupilumab

Authors	Gender, years	Time from atopic dermatitis diagnosis	Time from AA diagnosis	Clinical characteristics of AA	Previous treatments for AA	Time from Dupilumab onset to AA improvement	Clinical course
Darrigade et al. ²	Male, 28	Since childhood	1 year	Alopecia universalis, SALT score 87,4	Ciclosporin, methotrexate	3 months	Full regrowth at month 6 (SALT score –80,4)
Alniemi et al. ⁴	Female, 49	Since childhood	6 years	Alopecia universalis	–	Immediate	After 8 months of dupilumab therapy, she had full regrowth of hair on scalp and eyebrows. No improvement on eyelashes or the remainder of body hair
Aszodi et al. ⁵	Female, 25	Since childhood	5 years	Alopecia totalis	Topical corticosteroid, methotrexate	4 months	After 11 months, almost all hairs had regrown
Penzi et al. ⁶	Female, 13	Since 7 months	2 years	Alopecia totalis	Topical squaric acid and anthralin, pulsed prednisone, methotrexate	6 weeks	Grown pigmented, terminal hairs on approximately 60% of the scalp
Smogorzewski et al. ⁷	Female, 35	Since childhood	8 years	Alopecia universalis	Topical steroids, intermittent oral corticosteroids and ciclosporin	6 months	Full, thick regrowth of terminal hairs on her entire scalp after 12 months of dupilumab onset. She also noted eyebrow, axillary, and pubic hair growth
Ludriksone et al. (Patient 1) ⁸	Male, 38	Since 3 years	5 years	Alopecia universalis	Phototherapy, ciclosporin	22 weeks	Significant growth of pigmented hair in eyebrows, eyelashes, beard area and in the rest of body
Ludriksone et al. (Patient 2) ⁸	Male, 32	Since 2 years	2 years	AA with ophiasis pattern	Phototherapy, ciclosporin, azathioprine	21 weeks	Full regrowth of terminal hairs
Uchida et al. ⁹	Male, 44	Since childhood	8 years	AA in focal patches, SALT score 61,6	Topical and oral corticosteroids	3 months	SALT score decreased to 8

AA, alopecia areata; SALT, Severity of Alopecia Tool.

dupilumab (Table 1) and 6 publications describing 9 patients with dupilumab-induced alopecia.¹ It is unclear whether dupilumab induces true AA or a form of drug-induced alopecia. Alopecia associated with dupilumab tends to follow an androgenetic pattern and usually has an eczematous pattern upon histopathological examination. In addition, some patients improve with topical treatments without discontinuing dupilumab.⁵

According to previous reports, it seems that dupilumab can induce hair regrowth in alopecia areata. This usually occurs between 3 and 6 months into therapy, although it may begin after the first doses.⁴ In addition, scalp hair regrowth has been observed in all presentations of AA^{4–8} (Table 1).

The pathogenesis of AA has not yet been completely elucidated; however, the contribution of a Th2 immune response has been recently proposed. In AA, treatment with both intralesional corticosteroids and ustekinumab has been associated with significant downregulation of Th2 cytokines and chemokines.⁶

We report an additional case of significant improvement of AA after initiating dupilumab for AD. Whether hair regrowth is a direct effect of dupilumab or an indirect effect derived from a reduction of systemic inflammation is unknown.⁹ Currently, a clinical trial is being developed to evaluate the efficacy of dupilumab for the treatment of AA given the limited therapeutic options for this disease.¹⁰

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