Full scalp hair regrowth in a 4-year-old girl with alopecia areata and atopic dermatitis treated with dupilumab

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INTRODUCTION

Dupilumab resolved alopecia totalis in a 13-year-old girl treated for severe atopic dermatitis (AD).[1] The resolution of AD by dupilumab has been reported in children under the US Food and Drug Administration's approved age of 6 years and older.[2] These cases highlight dupilumab's ability to suppress the helper T cell type 2 (Th2) immune axis in children. Herein, we report full scalp hair regrowth in a 4-year-old girl with severe AD with concomitant alopecia areata (AA) treated with dupilumab.

Abbreviations used:

AA: alopecia areata
AD: atopic dermatitis
IL: interleukin
Th2: helper T cell type 2

CASE REPORT

A 4-year-old, otherwise healthy female, presented with AD resistant to topical steroids, calcineurin inhibitors, oral antihistamines, and emollients since infancy. She also had clinically diagnosed AA of the scalp, eyelashes, and eyebrows since the age of 2.5 years, which was similarly resistant to topical and intralesional steroids. She had no history of asthma or other atopic conditions and no other relevant family history. Physical examination revealed total nonscarring alopecia of the eyelashes and eyebrows as well as the scalp, with sparse hair on the vertex of the scalp (Fig 1). Scattered, hyperpigmented, lichenified, scaly plaques were present on the trunk, buttocks, and all the extremities.

We chose dupilumab to treat this patient's AD for several reasons: prior treatment failures, potential adverse effects of systemic immunomodulators, demonstrated efficacy of dupilumab in adults, and minimal side effect profile of dupilumab in older children.[3] Dupilumab was initiated at a dose of 200 mg subcutaneously every 2 weeks. Two weeks after the first dose, the patient's AD improved substantially, and her family reported an improvement in her hair growth. After 2 months of treatment, the patient reported minimal pruritus and continued improvement of her AD. On examination, dramatic scalp hair regrowth (but minimal regrowth on her eyelashes and eyebrows) was noted (Fig 1). After 4 months, her AD remained well-controlled, with minimal need for topical medications. The patient's scalp hair has fully regrown without the use of additional therapy.

DISCUSSION

AA is strongly associated with atopic diatheses,[4] and polymorphisms in interleukin 4 (IL-4) and IL-13 have been described in patients with AA.[5,6] The pathogenesis of AA remains to be elucidated. Similar to AD, biomarker profiling from the skin and blood of patients with AA suggests contributions from multiple

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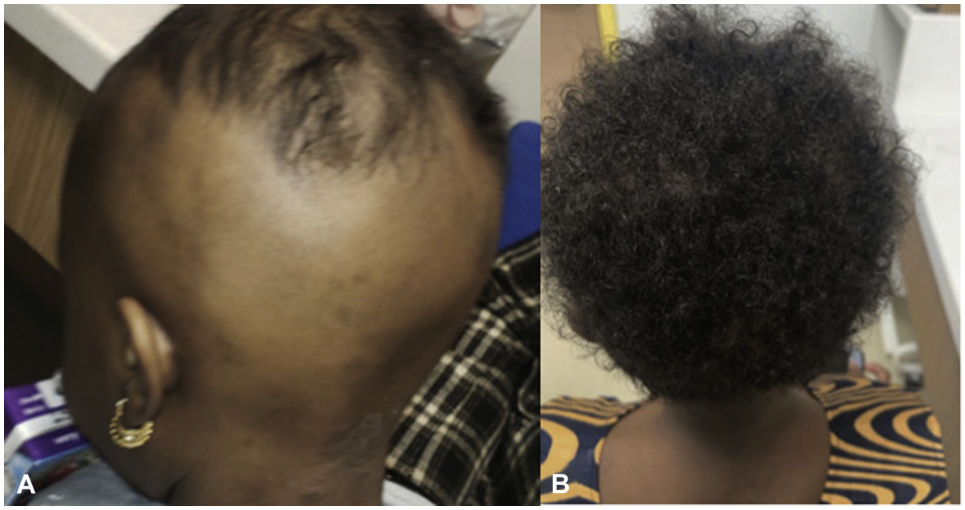

Fig 1. Before and after 2 doses of dupilumab. **A**, Posterior view 1 month prior to initiating dupilumab treatment. **B**, Posterior view 4 months after initiating dupilumab treatment.

immune axes, including a significant upregulation of the products of the Th2 response.[4,7,8] Both intralesional corticosteroids and ustekinumab have been used for hair regrowth in AA, and both have been shown to downregulate Th2 responses.[9] Dupilumab inhibits IL-4 receptor α and IL-13 receptor. It has been approved for adult and pediatric moderate-to-severe AD in patients aged 6 years or older and for moderate-to-severe asthmatics aged 12 years or older. Our observations add to the evolving paradigm of AA as an inflammatory disease with a strong Th2 orientation. Paradoxically, dupilumab has been associated with new-onset AA, indicating that the disease mechanisms of AA and the full extent of dupilumab's impact on the immune system remain to be fully elucidated.[10] While long-term safety monitoring and continued efficacy demonstration are needed, this case supports the utility of dupilumab for AA.

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