
Alopecia Areata in Severe Atopic Dermatitis Treated With Dupilumab

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Dupilumab, a human monoclonal antibody against interleukin-4 receptor α , acts by inhibiting the signaling of interleukin-4 and interleukin-13, both of which are type 2 cytokines that may be important drivers of allergic or atopic diseases such as atopic dermatitis (AD) [1]. Dupilumab is the first biological therapy to be approved for treatment of moderate-to-severe AD in adults who are candidates for systemic therapy. Administration of dupilumab improves the signs and symptoms of AD, including pruritus and anxiety and depression, and enhances patient quality of life [2,3]. A reassuring safety profile has been established, with conjunctivitis being the most significant safety signal [2-4]. We describe a patient with severe AD treated with dupilumab who developed alopecia areata within 6 weeks of his first exposure.

A 31-year-old white man with a 7-year history of severe AD and no other relevant past or family history presented with patches of hair loss on his anterior scalp. The patient had undergone previous treatment for AD consisting of phototherapy, topical and oral corticosteroids, cyclosporine, and azathioprine, although his response was poor. He was started on dupilumab at 600 mg subcutaneously followed by 300 mg subcutaneously every 2 weeks. After 6 weeks of treatment, his AD improved significantly; however, he noted hair loss in patches on his anterior scalp. Determination of the serum concentration of antithyroid antibodies, thyroglobulin, and thyroperoxidase yielded negative results. Thyroid-stimulating hormone, T3, and free T4 determinations were also found to be normal. The results of a biopsy indicated alopecia areata with epidermal changes suggesting atopic dermatitis (areas of focal epidermal inflammation with exocytosis, spongiosis, and parakeratosis, which present as deep and patchy perifollicular lymphocytic infiltrate and frequent fibrotic tracts). The patient was diagnosed with alopecia areata, treatment with intralesional triamcinolone was initiated, and dupilumab was continued. Follow-up is required to assess the response of alopecia to corticosteroids.



Figure. Development of alopecia areata during treatment with dupilumab. Clinical photograph of alopecia areata after 6 weeks of treatment and prior to treatment with intralesional triamcinolone acetonide.

To date, there has been only 1 reported case of alopecia areata following administration of dupilumab [5]. The patient was a man of a similar age to the patient we report, with a long history of severe AD and previous use of systemic drugs without response, who developed alopecia areata 5 weeks after initiation of dupilumab. However, as no biopsy was performed, the diagnosis of alopecia areata was purely clinical. Therefore, ours is the first report of biopsy-confirmed alopecia areata in a patient with severe AD treated with dupilumab.

The pathogenesis of alopecia areata is not completely understood, although several studies point to a heterogeneous process involving the T_H2 response. In light of these findings, dupilumab is also being tested in a phase 2 clinical trial (NCT03359356) as a possible treatment for alopecia areata in patients with or without AD [6]. However, other immune system mediators, such as T_H1 , together with downregulation of T_H2 pathways, may amplify the T_H1 pathway and promote the development of alopecia areata after treatment with dupilumab [7]. Alopecia areata and AD have common immunological pathways and increased proinflammatory activation. Onset of both diseases concomitantly has been reported in a systematic review [8].

Clinical trials to date with dupilumab [2,3,9] have not described alopecia areata as an adverse effect. These studies report only mild reactions, mainly conjunctivitis and injection site reactions. However, 2 clinical cases of alopecia areata have been reported during treatment with dupilumab in AD [5, present case]. Therefore, although the temporal relationship between administration of dupilumab and onset of alopecia areata does not ensure causality, the occurrence of both these events should raise suspicion. Therefore, it is important for clinicians to be aware that alopecia areata can occur in this context.

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Conflicts of Interest

J Sastre has served as a consultant to Thermo Fisher, MSD, Novartis, Genentech, Sanofi, Leti, Roche, FAES FARMA, Mundipharma, and GlaxoSmithKline. He has also received lecture fees from Novartis, GlaxoSmithKline, Stallergenes, LETI, and FAES FARMA and has received grant support for research from Thermo Fisher.

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B Barroso and A Molina declare that they have no conflicts of interest.

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