

Eosinophilic annular erythema treated with dupilumab

Abstract

Eosinophilic annular erythema is a rare, benign, recurrent condition characterized by annular skin lesions, tissue eosinophilia, and resistance to a variety of treatments. There are fewer than 30 cases reported in the English literature, 7 of which are in children. We present a case of recurrent eosinophilic annular erythema in an adolescent that was successfully treated with dupilumab, an interleukin-4 receptor alpha antagonist.

1 | REPORT OF A CASE

A 14-year-old African-American girl presented with an annular rash of 4 months duration that first appeared on the lower extremities and subsequently spread to involve the arms, trunk, and forehead. She reported severe pruritus but no associated joint pain, systemic symptoms, preceding illness, or new medications. Four years earlier, she had had a similar eruption, diagnosed as eczematous dermatitis that improved with time.

Physical examination revealed annular erythematous urticarial plaques with central hyperpigmentation (Figure 1) that symmetrically involved the trunk, breasts, arms, thighs, and forehead.



FIGURE 1 Annular erythematous urticarial plaques with central hyperpigmentation over back. Inset highlighting lesion of left mid-back

Punch biopsies revealed acute spongiotic dermatitis with intraepidermal vesicles and intravesicular eosinophils with focal epidermal ulceration. There was a superficial and mid-dermal mixed infiltrate with numerous eosinophils. Direct and indirect immunofluorescence were negative.

Laboratory examination was notable for an absolute eosinophil count of 0.70 (normal range 0.05-0.17 K cells/uL) and 11.3% eosinophils (normal range 1.0%-3.0%). Serum IgE was normal at 27 (normal range 0-200/ml).

She was diagnosed with eosinophilic annular erythema (EAE), and various treatments were tried over 10 months, including topical and oral steroids, oral dapsone, and oral tofacitinib, none of which resolved her skin lesions and symptoms.

The off-label use of dupilumab was discussed with the patient and her parents, and they elected for a trial; she was started on 600 mg subcutaneously on day 0, followed by 300 mg subcutaneously every 2 weeks. She noted dramatic improvement after two injections, with resolution of all lesions and associated pruritus (Figure 2). She continued to remain clear after 5 months of injections every 2 weeks.

2 | DISCUSSION

EAE is a benign, recurrent condition of unknown etiology that Peterson and Jarrat first described as annular erythema of infancy in



FIGURE 2 Resolution of annular plaques with residual hyperpigmented patches after 2 months of treatment with dupilumab

1981.¹ This rare condition, with fewer than 30 reports in the literature, is characterized by a relapsing-remitting course of persistent annular and figurate urticarial plaques predominantly affecting the trunk and proximal extremities.¹⁻³ Lesions resolve spontaneously after months to years and heal with no residual atrophy or scarring, although most reported patients exhibit recurrence.^{1,2}

Histologically, there is marked eosinophilic infiltration of the dermis, accompanied by a lymphocytic perivascular or interstitial infiltrate.² The main histologic differential diagnosis is Wells syndrome. In contrast to Wells, in EAE, the eosinophilic infiltrate is confined to the dermis, and there is no granulomatous inflammation or flame figures.^{1,2}

EAE is marked by its resistance to multiple treatments. Prednisolone and hydroxychloroquine are the therapeutic agents most frequently reported in the literature, but the majority of individuals who use them relapse.^{2,3} Additional single case reports have shown improvement with narrow-band ultraviolet B, dapson, and indomethacin, but indomethacin was discontinued after several doses because of associated syncope.³

We report the first case of EAE treated with dupilumab, an interleukin (IL)-4 receptor alpha antagonist. IL-4 and IL-13 are important cytokines in the generation of a type 2 inflammatory response, providing a suggested mechanism of action for dupilumab in the treatment of eosinophilic dermatoses.⁴ Dupilumab is approved for treatment of moderate to severe atopic dermatitis in adults, with clinical trials currently evaluating its use in children. The medication has been well tolerated in adults, with side effects notable for conjunctival inflammation, headache, and nasopharyngeal infections, but safety data in children are lacking.⁵

Our patient maintained clearance after 5 months of 300-mg injections every 2 weeks, with no reported side effects, although it cannot be excluded that she experienced spontaneous improvement given the chronic relapsing-remitting nature of the disease, and she will require further observation for monitoring of relapse. She will continue to be followed in clinic, with regular clinical assessment for side effects and tolerability; there is no plan to taper or discontinue treatment.

Keywords

pharmacology, therapy-systemic, urticaria

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