

Partial improvement of solar urticaria after omalizumab

To the Editor:

Solar urticaria is an uncommon but well described condition. Previously classified into 6 types (I-VI) based on the action spectrum, solar urticaria is now divided into 2 types: type I and type II.¹ Type I defines patients who have precursors located in the serum, plasma, or cutaneous tissue fluid that become photoallergens once activated by the appropriate wavelength and bind to IgE receptors, resulting in mast cell degranulation. Type II is also IgE-mediated, but precursors are found in both healthy patients and patients with solar urticaria. It is hypothesized that only patients with solar urticaria have an abnormal circulating IgE autoantibody that recognizes these irradiated precursors.¹ When treating solar urticaria, success is defined as either complete resolution of symptoms or an increase in the minimal urticarial dose required to elicit symptoms during phototesting.² A recently reported case demonstrated complete resolution of solar urticaria with omalizumab; however, the initial serum IgE was only 22 IU/mL, the specific omalizumab dose was not reported, and the patient had complete resolution after only 1 dose.³

We present a 16-year-old boy with solar urticaria who was refractory to oral antihistamines but improved partially with omalizumab. A previously nonatopic adolescent presented in February 2007 to the Allergy Clinic with a 5-month history of pruritic, erythematous wheals after sunlight exposure. Symptoms would occur within minutes and would progress to raised, confluent urticarial plaques only on sun-exposed skin. Once he returned indoors, his skin symptoms would completely resolve after 30 minutes without hyperpigmentation or eczematous changes. He denied symptoms indoors, symptoms when outside at night, or other systemic symptoms, but he had significantly altered his social behavior because of these symptoms. He had only tried over-the-counter sunscreen with minimal improvement. His initial workup included phototesting (Fig 1), a negative workup for porphyria (courtesy of Dr Karl Anderson, UTMB, Galveston, Tex), a negative anti-nuclear antibody and rheumatoid factor, erythrocyte sedimentation rate 7 mm/h, normal liver and renal function panel, normal white blood cell count and serum tryptase, mild eosinophilia (absolute eosinophil count, 926), and an elevated serum IgE (851 IU/mL).

Over the next month, the patient was unsuccessfully treated with loratadine (30 mg/d), cetirizine (20 mg/d), and diphenhydramine (up to 200 mg/d). After discussing other therapeutic options, the patient and parent consented to trying omalizumab (Xolair, Genentech Inc, South San Francisco, Calif). On the basis of his initial IgE level (851 IU/mL) and weight (57.7 kg), a calculated dose of 400 mg every 2 weeks for 3 months was initiated. Serum at baseline before omalizumab injections and then at 4 and 8 weeks was obtained for determination of free IgE (Table I). Free IgE was measured by using a surface Plasmon resonance assay with using the Biacore 3000 system (GE Healthcare). In this assay, omalizumab was covalently attached to the Biacore CM5 chip (GE Healthcare), and free IgE was measured as IgE that could bind to solid-phase omalizumab. The assay was calibrated by using known IgE levels in the absence of omalizumab. Performance characteristics of the surface Plasmon resonance assay were

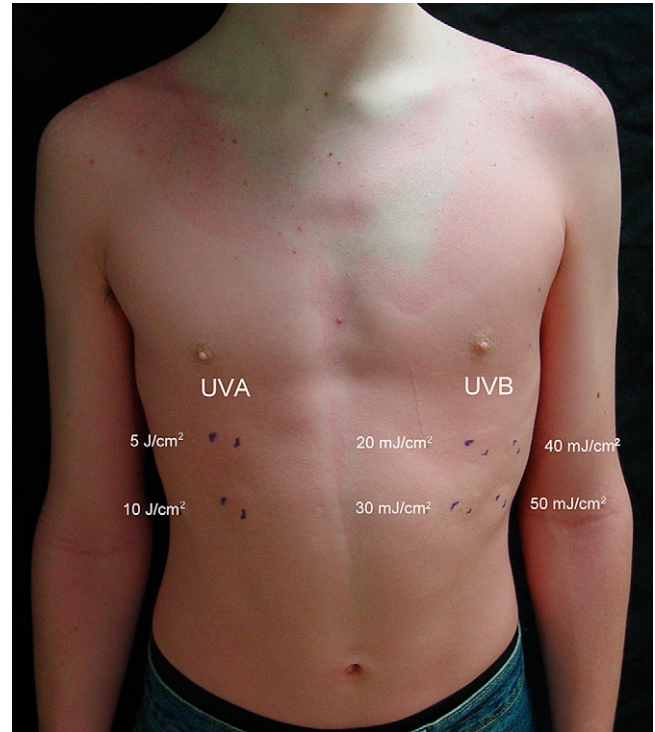


FIG 1. Phototesting demonstrating a wheal and flare for the UV-A (5 and 10 J/cm²) and UV-B (20, 30, 40, and 50 mJ/cm²) spectrum within 1 minute of testing. The patient demonstrated significant sensitivity with erythema and flushing even in areas protected with a Tyvek Protective Wear Suit (DuPont, Wilmington, Del). No reaction occurred to the visible light spectrum.

TABLE I. Measurement of total and free serum IgE

	Baseline	4 wk	8 wk
Total serum IgE (IU/mL)	559	1871	1653
Free IgE (IU/mL)	578	952.7	81.9
Free IgE/total IgE (%)	100	50.9	5
% Reduction in free IgE	0	49.1	95

analogous to the previous solid-phase immunoassay reported elsewhere.⁴ Total IgE was measured with the ImmunoCAP250 (Phadia, Kalamazoo, Mich) that is known to be free of interference by the presence of therapeutic levels of omalizumab in serum.⁵

Repeat phototesting was performed 1 week after his sixth omalizumab dose. UV-A and UV-B testing sites showed improvement with no immediate reaction that was previously seen on initial testing. However, erythema developed at all UV-A sites at 15 minutes (Fig 2), whereas only the 40 mJ/cm² and 50 mJ/cm² UV-B sites demonstrated significant erythema at 15 minutes (Fig 3). Discussion with the patient was conducted regarding continuing omalizumab infusions as well as further testing to include natural sunlight challenge because the patient was completely avoiding sunlight and wore a heavy winter coat throughout the spring in south Texas. Unfortunately, the patient was lost to follow-up, and repeated attempts to reach the patient failed.

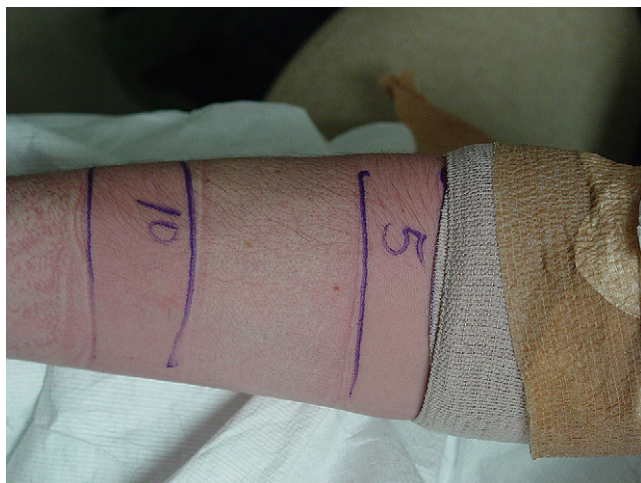


FIG 2. Repeat UV-A phototesting showing erythema starting 15 minutes after testing at both 5 and 10 J/cm².



FIG 3. Repeat UV-B phototesting. No erythema at the 20 and 30 mJ/cm² sites (*) but erythema at 15 minutes at the 40 and 50 mJ/cm² sites.

Similar to a case recently described, solar urticaria improved with anti-IgE therapy, although only partially in our case.³ Interestingly, the UV-B action spectrum improved more than the UV-A spectrum. One explanation could be that the initial classification of solar urticaria into 6 types found that the UV-B action spectrum (280-320 nm) showed passive and reverse passive transfer, suggesting the presence of an abnormal IgE autoantibody that can bind irradiated precursors from either healthy patients or those with solar urticaria (now classified as type II).⁶ We also measured the level of free IgE to demonstrate appropriate free IgE suppression as a result of administering omalizumab to a patient with an IgE level greater than 700 IU/mL. Despite a high IgE level, we were able to demonstrate appropriate suppression of free IgE (95% at 8 weeks). We hypothesize that other well described variables regarding omalizumab response including variations in receptor expression, specific/total IgE ratios, and cellular sensitivity may have accounted for his lack of dramatic improvement on repeat phototesting.⁷ Two other reports of omalizumab with physical urticaria demonstrated complete resolution after a single dose for cholinergic urticaria,⁸ whereas a case of cold urticaria had

marked improvement after 2 months with complete resolution at 5 months.⁹

Further study is warranted to determine the role of anti-IgE for solar urticaria for different action spectrums (UV-A, UV-B, visible light). This patient showed a delay in erythema by 15 minutes during phototesting after 10 weeks of omalizumab, although there was only improvement in the minimal urticarial dose for the UV-B spectrum (20-40 mJ/cm²). Oral antihistamines still remain the mainstay therapy, improving the intensity of erythema and wheal formation in 63% of patients.¹⁰ However as many as 33% of patients with solar urticaria have elevated IgE levels, and omalizumab may be an option if other therapeutic modalities fail.⁹

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Expression patterns of atopic eczema and respiratory illnesses in a high-risk birth cohort

To the Editor:

Atopic eczema (AE) is the most common chronic inflammatory skin condition in childhood.¹ The natural course is variable and difficult to predict. Some patients completely "outgrow" their disease, while others develop more significant and persistent disease.² In addition, AE in early childhood has been linked to an increased risk of allergic rhinoconjunctivitis and asthma. Patterns of expression and identification of factors associated with the persistence of AE may lead to improved primary and secondary prevention strategies to halt the progression of the atopic march, as well as improved prognostication of the clinical course