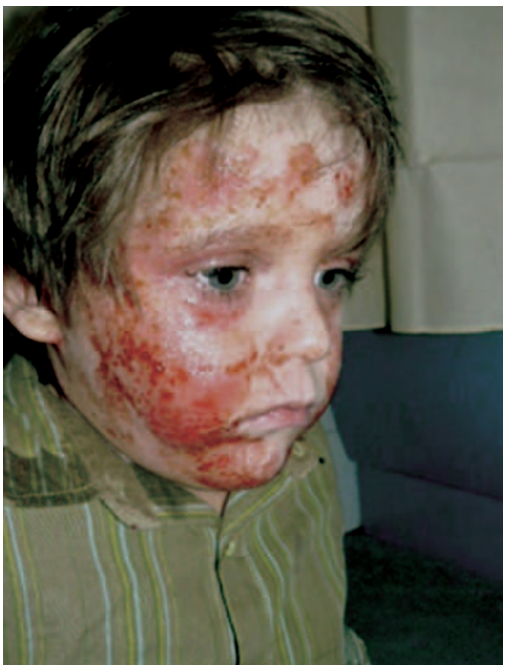
PERSPECTIVE

Acting on the evidence

Allergy isn't the whole story on atopic eczema, says **Hywel Williams**.

Atopic eczema, the largest group among nine types of eczema, has become so widespread that it now affects approximately one in five children living in cities across the world, according to estimates by the International Study of Asthma and Allergies in Childhood (ISAAC)[1]. The name 'atopic eczema', however, is a misnomer. Diagnosis is based on itching, visible signs of eczema affecting the skin folds, and family history, but ISAAC studies show that around half of those so described are not, in fact, atopic (predisposed to allergic hypersensitivity) — they do not have elevated IgE antibodies in their blood against common environmental allergens.

Most children with severe eczema attending hospital clinics are atopic, often with either asthma or food allergies, or both. Identifying a potential culprit allergen and then limiting exposure to it, however, can rarely control their condition. Even if they are truly allergic to something like cat dander or house dust mites, immune tolerance can occur with repeated exposure — in which case reducing exposure by frantic cleaning, or intermittent exposure, could make things worse (and could also explain why atopic eczema is more likely to flare when near an unfamiliar cat). Moreover, non-allergic factors such as: temperature extremes; dry wintry or conditioned air; soaps and shampoos; sweating; abrasive garments; *Staphylococcus aureus* infection; psychological stress; and habitual scratching might be more provocative to their eczema than allergens[2].



Telling this child it's only eczema and you will grow out of it is not the way forwards.

IMAGE COURTESY OF HYWEL WILLIAMS

Genes responsible for the integrity of the skin barrier determine much of the dry skin associated with atopic eczema. This might contribute to an enhanced reactivity to environmental irritants, such as soap, or to allergens. Contact with irritants could trigger low-grade eczematous inflammation, which then leads to atopic eczema, possible followed by asthma and hay fever, and so proceeds the 'allergic march'. Genes that govern aberrant inflammatory responses might also play a role. Yet, genetics cannot account for the findings that atopic eczema is more common in wealthier, smaller families, or that children migrating from low- to high-prevalence countries assume higher rates in their adopted countries. Nor can geneticists explain the rapid increase in eczema symptom prevalence reported in the ISAAC study. The interaction between genetic and environmental factors may be complex. Just as a fruit machine only pays out when all three cherries align, flares of eczema might only occur when multiple components such as genes, allergens and low humidity coincide.

For all these reasons, it is important not to over-emphasize allergic factors in understanding atopic eczema, or in strategies for prevention and treatment.

Prevention is nevertheless a real possibility. Early life *(in utero* and soon after birth) is a critical period to evaluate strategies, including modifying bacterial gut flora with probiotics, or exposure, rather than allergen avoidance, to induce immune tolerance. It is also possible that barrier enhancement with emollients in newborns onwards could prevent, delay or reduce the severity and progression of allergic disease in those so predisposed.

Treating eczema remains a challenge[3]. Whilst atopic eczema is not a killer, witnessing children scratch themselves until their skin bleeds is heartbreaking, and the associated sleep deprivation has an impact on the family as a whole. Quality of life impairment and costs associated with atopic eczema are often greater than with other conditions such as childhood diabetes. Complications such as skin infection with *Staphylococcus aureus*, herpes simplex virus and associated asthma, hay fever and food allergies pose additional problems.

The biggest problem is undertreatment — not because the treatments don't work, but because of a lack of education and an excessive fear of side effects of topical corticosteroids reported in the 1960s. Just as inhaled steroids are needed to deal with the inflammation of asthma, topical steroids are needed to treat skin inflammation. A potent topical corticosteroid plus a soothing emollient is usually enough to treat atopic eczema in children, inducing remission with a 2–3 week blast of corticosteroid treatment to gain control over the condition and then maintain remission through weekend corticosteroid therapy[4]. Other creams or ointments such as pimecrolimus and tacrolimus are also useful for treating sensitive sites such as the face.

Drugs that calm the immunological storm need to be developed to improve quality of life and disease progression for those with severe atopic eczema — new, smarter and more specific agents, with fewer adverse effects than the older systemic agents. ■

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1. Odhiambo, J. *et al. J Allergy Clin. Immunol.* **124**, 1251–1258. (2009).
2. Williams, H. C. *N. Eng. J. Med.* **352**, 2314–2324 (2005).
3. Langan, S., Silcocks, P. & Williams, H. C. *Br. J Dermatol.* **161**, 640–646. (2009).
4. Nankervis, H., Maplethorpe, A. & Williams, H. C. *BMC Dermatology* **11**, 10 (2011).

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