

Atopic eczema: a modern epidemic

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Atopic eczema (dermatitis) is a chronic inflammatory and itchy skin disease associated with atopic asthma and atopic rhinitis. It primarily affects young children and its incidence has been increasing in recent years. Global prevalence rates are 1–20% in children, with higher rates reported in ‘westernised’ countries. Atopic eczema exacts a high price in terms of physical suffering to the patient and psychosocial disability and financial cost to the individual, the family and society.

Diagnosis

Atopic eczema is easy to recognise in the clinical setting but diagnostic criteria have been slow to evolve. In 1994 the UK Working Party on Atopic Dermatitis

Table 1. UK Working Party on Atopic Dermatitis: diagnostic criteria.¹

An itchy skin condition in the past 12 months plus three of the following:

- onset below the age of 2 years*
- history of flexural involvement (including neck) and the cheeks in children under the age of 10 years
- history of generally dry skin in the past year
- personal history of other atopic disease**
- visible flexural eczema as per photographic protocol, or eczema involving the cheeks/forehead and outer limbs in children under the age of 4 years

*not used in children under 4 years old.

**for children under 4 years old, history of atopic disease in a first-degree relative.

reported a validated set of diagnostic criteria, which has led to more accurate assessment of prevalence in different settings.¹ The major criterion is an itchy skin condition; the minor criteria (Table 1) increase the specificity for atopic eczema. The term ‘atopic’ suggests an association with the allergy antibody immunoglobulin (Ig)E. However, since raised IgE and positive skin prick and radioallergosorbant tests (RAST) are present in only 70% of patients with flexural eczema they are best regarded as epiphenomena.²

Faced with an individual patient, there is seldom doubt about the diagnosis. Most have symmetrical, ill-defined,



excoriated, red, exuding, crusted or scaly patches at any site but more often in the flexures. Atopic eczema follows a fluctuating course, aggravated by stress, skin infection (usually staphylococcal), temperature or climate change, house-dust mite allergy, irritants and aeroallergens (mainly pollens and animal dander). It has a tendency to improve gradually throughout childhood but in a significant minority it persists and in some may present or relapse in the teens or at an older age.

Clinical features

Typically, atopic eczema develops in infants, who present with itchy inflamed papules and vesicles on the cheeks and limbs in the first few months of life. It spreads, and in severe cases there is generalised involvement before the age of 1 year. Acute eczema quickly becomes excoriated and impetiginised, usually with staphylococcal, and less often with streptococcal, infection (Fig 1). Herpes

Fig 1. (a) and (b) Atopic eczema with bacterial (*Staphylococcus aureus* and β -haemolytic streptococcus on skin swabs) infection in a three-month old infant. Eczema developed in this child at the age of 2 months but largely resolved by age 6 months after topical emollients, steroids and oral antibiotics. She was also changed to a hypoallergenic milk formula (Nutramagen).

simplex infection is a serious complication, even in infants. In older children and adults, chronic eczema leads to excoriated and lichenified (thickened) lesions (Figs 2–4), often with pigmentary changes in patients with darker skin types.

Skin irritation and sleep upset are prominent features, and distressing for both the child and the parents. In addition, parents and carers may spend hours each day on skin treatments, often with reluctant children. They may fret with their child, agonise over dietary changes and invest in alternative remedies. They may feel guilty that they are responsible for their child's suffering. The child may

lose time from school, and the parents have to juggle time off work to look after them or attend appointments. The extra demands on clothing, bedding, household mite measures and washing-machine maintenance mean added financial burden for the family.

The child's behaviour may suffer: parents of more severely affected children often report that they are irritable, hyperactive, manipulative, unable to concentrate or uncooperative with treatment. In many families more than one sibling is affected (Fig 2). Older affected children may become depressed and unwilling to participate in school and

social activities (Fig 3). They may become isolated from their peers and suffer distress over perceived poor body image. They may fall behind in schoolwork and have to modify their career ambitions, either because of poor grades or to avoid jobs which might aggravate their eczema. Many endure additional morbidity from asthma and hay fever and some develop contact type IV allergies (eg to fragrance, topical agents including preservatives, antibiotics and steroids) or anaphylactic type I reactions (eg to pets, foods, peanut or latex rubber) (Fig 2d). Growth retardation and anaemia are not uncommon.



Fig 2. (a–c). Chronic lichenified and excoriated atopic eczema in a 3-year-old child with growth retardation, alongside his 18-month-old brother (in pushchair) who also has eczema. Both have significant quality of life impairment. (d) Acute allergic reaction on ingestion of peas, which settled in 4 hours (in the 3-year-old child).

Adults with atopic eczema adapt their lifestyle to cope with the discomfort and inconvenience:

- they may have had to modify their career ambitions and take time off work
- they may become disillusioned with therapies and may have lost contact with their carers, and
- they usually have to pay for their prescriptions, which means several different topicals (in large quantities).

A minority of adult patients develop atopy-related eye disease and keratoconus, often with herpetic eye infection, and may become visually impaired (Fig 4). The toll on their social life and personal development is, in the worst cases, incalculable.

Treatment: anything new?

Management of atopic eczema is complex.³ The mainstay of eczema treatment is a therapeutic triangle, with emollient therapy at the apex and topical steroids (anti-inflammatory and immunosuppressive) and antimicrobial agents at the base. The addition of dressings, wet wraps and sedative antihistamines may help, house-dust mite and allergen reduction is often advised, and hypo-allergenic milk formulae may benefit selected infants. More severe cases may respond to out/inpatient therapy (topical treatment applied by dermatology nurses), phototherapy or systemic immunosuppressives (ciclosporin, azathioprine, mycophenolate mofetil). Many families privately obtain alternative, homeopathic or herbal remedies. Psychological support and behavioural therapies have proven beneficial but are rarely incorporated into treatment plans.

Advances in the understanding of the cutaneous cellular and immune dysfunction underlying eczema have led to new treatments. Interferon gamma proved beneficial but toxic.⁴ The topical immunomodulators or calcineurin inhibitors, pimecrolimus (Elidel cream) and tacrolimus (Protopic 0.03% and 0.1% ointment), are also anti-inflammatory and have been licensed in the UK for

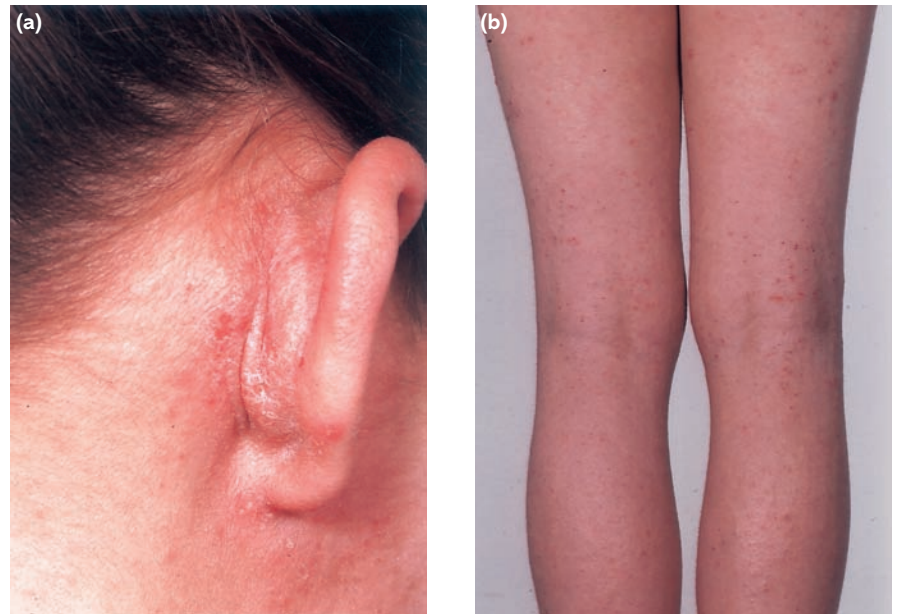


Fig 3. (a) and (b). A 10-year-old girl with lifelong generalised atopic eczema, causing severe physical and psychological distress. Skin swabs show methicillin-resistant *Staphylococcus aureus*. She has disturbed nights due to itching (creaming or change of bedding performed three to four times nightly). She is falling behind in school work, unwilling to participate in activities, reluctant to go out and clinically depressed. The family dynamics are affected as her two younger siblings receive less attention and her parents are tired and stressed.

the treatment of atopic eczema (age over 2 years) since 2001.^{5,6} These are effective and safe alternatives to topical steroids in many patients who are controlled inadequately with conventional treatment. They are particularly useful in managing facial eczema and avoid the cutaneous toxicity associated with topical steroids

(skin atrophy, striae, telangiectasis, bruising).

The inverse relationship between the incidence of infectious and atopic diseases has prompted trials of immunisation with harmless organisms such as *Mycobacterium vaccae*, with mixed results.⁷



Fig 4. (a) and (b). Lifelong atopic eczema and atopy-associated eye disease and keratoconus complicated by herpetic skin and eye infection (leading to blindness in the right eye and perception of shape and light in the left) in a stoical adult age 42 years. He has a guide dog and continues to work in a dispatch office.

Epidemiology

Several recent studies in diverse 'westernised' societies have recorded prevalence rates for childhood atopic eczema of 20% and rising.^{8,9} A comprehensive study (questionnaire, interview and examination) of 1,500 12 to 16-year-old schoolchildren in Denmark found a lifetime prevalence of 21%.¹⁰ A similar study of 12,000 children aged 7, 12 and 16 years in Singapore reported a 1-year prevalence of 23% and 22% in 7-year-olds and 16-year-olds, respectively, with higher rates in the Chinese and Malay communities.¹¹ In a longitudinal study of four million Japanese schoolchildren, prevalence rose from 15% to 24% between 1985 and 1997.¹²

The rapid rise in the incidence of atopic eczema over the past 50 years cannot be explained by changes in genetics or diagnostic criteria. Environmental factors have been invoked to account for the steep rise in prevalence, which is seen mainly in urban or industrialised areas and in well-off families (who tend to have fewer children and excessive skin cleansing).¹³ Potential contributory factors include:

- the decline in infectious diseases and subclinical microbial exposure in childhood, which determines the T Helper (Th1/Th2) balance (the hygiene hypothesis)^{14,15}
- changes in the home environment that encourage house-dust mite proliferation (heating, carpets, insulation)¹⁶
- pollution, and
- water hardness.¹⁷

The incidence increases in the children of parents who migrate from low to high prevalence areas.^{9,18}

Measurement of psychosocial impact

The development in recent years of validated measures of the impact of chronic diseases on psychological wellbeing and social development has shown that atopic eczema can – and frequently does – lead to impaired quality of life. The Children's Dermatology Life Quality

Index (CDLQI) detailed 14 different areas, including effects on emotions, social development, sleep upset, schooling, hobbies and treatment issues.¹⁹ Refinements, measuring the psychological impact of atopic eczema on infants,²⁰ affected adults and family members, provide further evidence of the damage caused by eczema, which may exceed that of psoriasis, acne, diabetes and asthma.²¹ Furthermore, patients are often critical of the information, support and treatment available to them.²²

Assessing the economic impact

The measurable cost of treating atopic eczema is derived from estimated figures for:

- healthcare, including hospital visits and prescribed topical and systemic treatments, and
- the personal costs to patient and family of over-the-counter and alternative therapies, clothing, bedding, house-dust mite measures etc.

More difficult to assess are the unseen costs, including time off school or work for patient and parent, lifestyle, housing and dietary modifications, and impact on schooling and career. An estimated UK annual cost (1995) of £465 million was derived from a study of 146 adults and children in a Lothian general practice.²³ A similar community-based survey of preschool children in Nottingham (1995–96) calculated a figure of £47 million for that age group,²⁴ thought

to be an underestimate. A review of insurance claims for eczema (excluding costs to patient and family) in the USA estimated a national annual cost of \$900 million.²⁵ This was similar to the costs of other chronic disorders, such as epilepsy and chronic lung disease.

Conclusions

The reasons for the rapid recent rise in the prevalence of atopic eczema in industrialised countries are unclear. The impact on the patient and society (physical and psychological disability, social and financial cost) has been underestimated. Research and investment in developing safer effective treatments for severe eczema must be encouraged.

Conflicts of interest

The author has no competing interests or affiliation to any pharmaceutical company.

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Key Points

Atopic eczema is now one of the commonest chronic conditions in children

Prevalence in many countries has trebled in the past 50 years – a modern epidemic

Environmental and social factors are thought to be responsible

Atopic eczema has a negative impact on quality of life for both patient and family

The financial burden of atopic eczema is significant

New and better treatments depend on progress in understanding the dysfunctional immunology of atopic eczema

KEY WORDS: atopic eczema, cost, dermatitis, epidemiology, quality of life, treatment

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