

Atopic Dermatitis for Family Physicians

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Introduction

Atopic dermatitis (AD), also known as atopic eczema is a chronic, relapsing, inflammatory skin disease that can cause significant physical, psychological and social stress for patients and their families.¹ This article focuses primarily on AD in adults. It is the most frequent inflammatory skin disease in the western world and is often characterized by chronic inflammation and pruritus interrupted by acute flares and bacterial infection.^{2,3} The majority of the care of AD is provided in primary care, with a minority of patients being referred to secondary care. There are currently extensive cost implications to the National Health Service (NHS) for both treating patients and for lost working days.⁴ AD can be a therapeutic challenge, especially in primary care, and there appears to be a great potential for improving the outcome and cost effectiveness of treatment in the community setting.⁴

Epidemiology and pathogenesis

AD typically begins in young infants or early childhood and subsides spontaneously by adolescence in approximately 90% of patients although it can persist into adulthood in about 10% of patients.⁵ The incidence of AD is generally considered to be increasing worldwide.⁶ AD affects both sexes equally, and in the United Kingdom (UK) approximately 15-20% of school-aged children and 2-10% of adults will be affected by the condition at some stage.⁷

AD appears to result from a complex interplay between defects in skin barrier function, environmental agents, modified immune responses of the immune system to exogenous and endogenous factors, IgE-mediated mechanisms and other factors. However, the pathogenesis leading to the precise manifestation of AD is not completely understood.^{3,8}

Diagnosis

There are no laboratory or diagnostic tests for AD. The diagnosis is based on visual assessment and clinical history. The UK diagnostic criteria (Table 1) has been shown to be the most extensively validated for AD in comparison to the Hanifin and Rajka criteria, Schulz-Larsen criteria, Diepgen criteria, and

Kang and Tian diagnostic criteria. Although several different diagnostic criteria have been developed they should mainly be used for research purposes as opposed to daily clinical management.⁴

Skin tests and laboratory investigations (specific IgE) may be helpful in the investigation of provocative factors such as food or environmental allergens. It is important to note that laboratory investigations should be interpreted in the context of the patient's history.⁹

It is often difficult to differentiate AD from other skin conditions (e.g. seborrhoeic dermatitis, contact dermatitis, psoriasis, scabies). However, a family history of atopy and the clinical distribution of the lesions are helpful in making the diagnosis. Other conditions that need to be considered in the differential diagnosis of AD are metabolic and nutritional deficiencies, malignancies and immunodeficiency syndromes that present with skin manifestations.⁸

Table 1 – UK Working Party Diagnostic Criteria⁴

<p>The patient must report an itchy skin condition (or parental report of scratching or rubbing in a child) in the last 12 months, plus three or more of the following:</p> <ul style="list-style-type: none"> • History of involvement of the skin creases (front of elbows, behind knees, fronts of ankles, around neck or around eyes) • Personal history of asthma or hay fever (or history of atopic disease in first degree relative if child aged under four years) • A history of generally dry skin in the last year • Onset under the age of two years (not used if child aged under 4 years) • Visible flexural dermatitis (including dermatitis affecting cheeks or forehead and outer aspects of limbs in children under four years)
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Management

The management of AD should involve a combination that includes short-term treatment of flares and a long-term maintenance approach to prevent flares. For patients with mild to moderate AD, topical therapy may be sufficient to control the condition. Patients with more severe disease may require advanced therapy such as phototherapy or systemic therapy.

Education

For optimal disease management, patients and/or their carers should be educated about the nature of AD, the need for continued adherence to prescribed treatment and about the appropriate use of topical therapies. Time spent educating patients and carers have been shown to have a positive effect on disease outcomes. Patients may also benefit from written information to reinforce learning.⁸

Emollients

Emollients soften the skin, aid in restoring the impaired barrier function, reduce itching, prevent moisture from leaving the skin and increase the efficacy of topical corticosteroids (TCS). They also replace the natural surface oils that are essential to preventing irritant materials, infection and allergy-inducing substances from entering the skin.⁴

Healthcare professionals should offer a range of emollients, and prescriptions should be reviewed frequently. To optimise adherence to emollient therapy, creams, lotions, and ointments, or a combination can be used depending on patient preference. Continued use of emollients during periods of disease quiescence can reduce the likelihood for exacerbations.¹⁰

When the treatment regimen involves both an emollient and TCS, there is no evidence on which to base the order of application. Patients should be advised to apply emollients liberally and frequently (at least 2-4 times a day). It is especially important to use emollients during or after bathing. The emollient should be applied in the general direction of growth of body hair in order to prevent accumulation at hair bases which might predispose to folliculitis. Emollients can become contaminated with bacteria and the use of pump dispensers minimises this risk. If the emollient is in a pot it should be removed with a clean spoon or spatula.⁴

Topical corticosteroid therapy (TCS)

TCS is considered first-line therapy for AD flares. Available preparations include ointments, creams, gels, lotions, liquids, and foams. Ointments and creams are generally the most effective in treating AD as they tend to be more moisturising.¹⁰ The least potent preparation required to control AD, particularly in sensitive areas, should be utilised. When possible the TCS should be stopped for short periods to reduce the risk of adverse events.⁸

TCS is categorised into four groups according to potency: mild, moderately potent, potent and very potent. The choice of TCS potency should be tailored to the age of the patient, the body region being treated, and the severity of inflammation. Patients should be advised to apply TCS once daily. If there is an inadequate response to once daily application, the frequency should be increased to twice daily.⁴ Once control has been achieved, twice weekly maintenance therapy with a TCS should be considered in patients with moderate to severe AD experiencing frequent relapses. The local adverse effects of TCS

usage include skin thinning, bruising, perioral dermatitis, folliculitis, pruritus, allergic contact dermatitis and the spread of fungal infection. Patients being treated with intermittent courses of TCS should be reviewed regularly (depending on TCS potency and site of application) to determine response to therapy and assess skin for potentially reversible atrophic changes.⁴

Table 2 - The 'fingertip unit' (FTU) is a method of determining the amount of TCS to apply. It is described as "the amount of ointment expressed from a tube with a 5 mm diameter nozzle, applied from the distal skin crease to the tip of the palmar aspect of the index finger." The following table is a guide to the use of FTU in adults.⁴

Skin area	FTU per dose
Face and neck	2.5
Torso and abdomen	7
Back and buttocks	7
Entire arm and hand	4
A hand and fingers (front and back)	1
Entire leg and foot	8

Topical calcineurin inhibitors (TCIs)

TCIs are non-steroidal immunomodulating agents licensed for the treatment of AD.⁴ TCIs work by inhibiting the phosphatase activity of calcineurin to block expression of cytokines and are thought to represent a more targeted way to limit inflammation and avoid many of the adverse effects of TCS. TCIs may be used either as monotherapy, as a combination or as sequential therapy. TCS are generally less expensive and more effective than TCIs although individual clinical situations will arise in which TCIs are preferred.¹⁰

Two TCIs are available: tacrolimus (0.03% and 0.1% ointments) and 1% pimecrolimus cream. The tacrolimus 0.03% and 0.1% ointments are both licensed for moderate to severe eczema and the 0.03% ointment is licensed for use in children aged two years and over. The 1% pimecrolimus cream is licensed for mild to moderate eczema in patients aged two years and over. The use of tacrolimus should be limited to doctors with a specialist interest and experience in treating AD.⁴

TCIs should not be used as first line treatment unless there is a specific reason to avoid the use of TCS.⁴ Given the high cost of TCIs, and the fact that their long-term safety is not fully known, they are generally reserved for patients with persistent disease or frequent flares that would require continuous TCS treatment. They are also of use in patients with severe disease in sensitive skin areas (e.g. around the eyes, face, neck and genitals) where systemic absorption and the risk of skin atrophy with TCS are of concern. Considering the possibility that the normal immunological response to infection may be suppressed,

TClIs should not be applied to skin which appears actively infected.^{4, 8}

Dressings and wet wrap treatment

Patients with non-infected moderate to severe AD can be advised to cover affected areas with dry wrap dressings to provide a physical barrier to scratching and improve the retention of emollients. Wet wrapping generally consists of two layers of bandage applied over topical preparations. The bottom layer is soaked in warm water, squeezed out and then put onto the skin over the topical preparation. The top layer is dry. Wet wraps can be worn under nightwear or ordinary clothes and used during the day or night. They are available in bandage form or as garments.⁴ Disadvantages include a high cost, inconvenience, a need for specialised training, and an increased potential for adverse effects from occluded corticosteroids (such as systemic absorption, atrophy, striae), and increased incidence of skin infection.¹⁰ There is currently insufficient consistent evidence on which to base a recommendation for wet wrap use in the primary care setting.⁴

Antimicrobial measures

Skin lesions of around 90% of patients with AD are colonised compared to less than 5% of individuals with healthy skin. Staphylococci are the main organisms isolated although other organisms such as streptococci may also cause infection. The routine swabbing of skin is not indicated although swabs of potential Staphylococcus aureus carriage sites should be considered in patients with recurrent infection. Oral antibiotics are not recommended in the routine treatment of non-infected AD but patients with clinically infected AD can be prescribed short term oral antibiotic treatment based on local/regional antibiotic sensitivities. However, first- or second-generation cephalosporins or penicillins for 7 to 10 days are usually effective in managing bacterial infection. Macrolides are less useful alternatives due to resistant patterns in patients with AD. Patients with AD are also prone to recurrent viral infections. Eczema herpeticum is a severe disseminated herpes infection that is a serious risk in patients with widespread AD and may be misdiagnosed as a bacterial infection. Patients with eczema herpeticum normally require systemic antiviral treatment^{4, 10}.

Antihistamines

Although first-generation antihistamines do not directly affect the itching associated with AD, the sedative effects have been found to help improve sleep. Therefore, short-term bedtime use of sedating antihistamines should be considered in patients with AD where there is debilitating sleep disturbance. Daytime use of first generation antihistamines should be avoided given their sedative effects. Non-sedating antihistamines appear to have limited value in patients with AD but they may provide some benefit in patients with allergic triggers.^{4, 8}

Dietary interventions

Although there is an association between IgE mediated food allergy and AD severity in infants, it is unclear whether hypersensitivity to food is a major factor in causing and maintaining AD. Dietary exclusion is not recommended for managing AD in patients without confirmed food allergy. The exclusion of foods during pregnancy and breast feeding to prevent the development of AD in infants is not recommended. Breast feeding for three months or more may help prevent the development of infant eczema where there is a family history of atopy. However, current UK guidelines state that weaning should start at six months.⁴

Table 3 - Guidance on when to refer to secondary care⁴

Eczema herpeticum (widespread herpes simplex) – emergency referral
Uncertainty concerning the diagnosis
Poor control of the condition or failure to respond to appropriate topical treatments
Psychological upset or sleep problems
Recurrent secondary infection

Other therapies

Systemic corticosteroids are usually reserved for the acute treatment of severe AD exacerbations. Prolonged use of oral steroids is associated with potentially serious adverse effects and their long-term use should be avoided. Furthermore, relapses are common following discontinuation of oral corticosteroid therapy.⁸

Ultraviolet (UV) phototherapy may also be beneficial for the treatment of AD in adults. In addition, systemic therapies are available and may be broadly classified into traditional medications (e.g. cyclosporine, azathioprine, methotrexate) and biologic agents (targeted monoclonal antibodies). These options are available for severe, refractory AD. These therapeutic options should generally be reserved for unique situations and require consultation with a dermatologist. These therapeutic options are beyond the scope of this article.⁸

Competing Interests

None declared

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