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IN NEXT MONTH'S MMC SUPPLEMENT

Paracentesis in the management of ascites

The clinical examination of the thyroid gland

Techniques for effective bedside teaching

Common rashes in children: 1

While one of the great attractions of dermatology is the wide variety of clinical cases seen, a relatively small number of conditions make up the majority of dermatological cases seen in paediatric clinics. A simple lack of both education and clinical exposure mean that these cases often cause a disproportionate amount of anxiety for the doctor asked to diagnose and treat a child with a rash. Most present with a clear history and distinctive examination findings and respond well to appropriate treatment. This is the first of two articles which will help the physician approach a child with a rash with greater confidence.

Atopic dermatitis

Atopic dermatitis, also called atopic eczema, is the most common inflammatory skin disease of childhood. It affects up to 20% of children, and its incidence is increasing.

Atopic dermatitis is a major public health problem worldwide and can have a profound effect on the quality of life for both children and their families because of the intractable itching, secondary infections, sleep deprivation and the effects of a highly visible skin disease, which can result in self-consciousness and avoidance of sports and social activities (Lui et al, 2007).

Natural history

The onset of atopic dermatitis usually occurs in early infancy or childhood. It resolves by adolescence in only half of cases and can persist into or start in adulthood (Spergel and Paller, 2003).

Clinical features

Atopic dermatitis is characterized clinically by chronic or relapsing dryness, redness, intense pruritus, soreness, pain and excoration in a typical distribution. This results in continual scratching and subsequent worsening of the condition.

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Pathologically there is increased epidermal water loss, leading to dry skin and increased antigen absorption. The skin barrier is dysfunctional as a result of this water loss and ceramides – which are the major water-retaining molecules of the epidermis – are reduced (Leung et al, 2004). The skin becomes excessively sensitive to environmental irritants and to secondary infection, most commonly with *Staphylococcus aureus* and streptococcus.

Acute lesions present as erythematous papules and vesicles (multiple tiny fluid-filled blisters), as well as thickened scaly lesions which weep serous fluid. The chronic scratching and rubbing induces a characteristic skin thickening with accentuated skin creases known as lichenification (*Figure 1*). Patients with darker skin develop marked post-inflammatory pigmentation even after the active episode has settled down (*Figure 2*).

Figure 1. Lichenification: note thickened scaly skin with increased skin markings. There are multiple excoriations present.

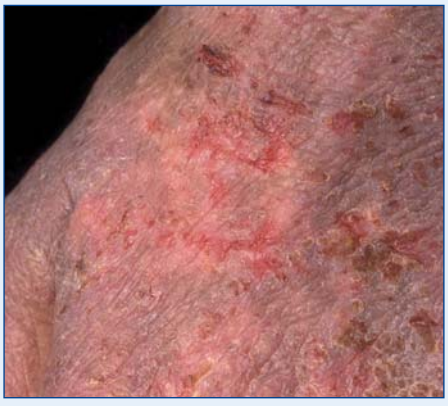


Figure 2. Resolving flare of atopic dermatitis with marked post-inflammatory hyperpigmentation at previously affected sites.

Approximately half of patients with atopic dermatitis will also develop asthma and allergic rhinitis later in their lives (Boguniewicz et al, 2003). A positive family history of these atopic conditions is typical.

Distribution

In infants, the face and scalp are the most commonly affected sites with limb folds and hands frequently and symmetrically affected. In older children the typical flexural pattern is seen but extensor surfaces and trunk are also involved. Severe cases have a more widespread distribution and can affect nearly all of the skin.

Associated features

Other clinical features that might help in making a diagnosis include a Dennie–Morgan infraorbital fold, thinning of the lateral eyebrows and white dermographism.

A Dennie–Morgan infraorbital fold can be seen in about half of patients with atopic dermatitis. It appears as an additional line below both lower eyelids. Thinning of lateral eyebrows (Hertoghe's sign) is seen in around 40% of patients. White dermographism is delayed whitening of the skin at the site of applied firm stroking in atopic patients, in contrast to the redness that would occur in non-atopic patients.

Differential diagnosis

The skin lesions in atopic dermatitis can have a highly variable presentation, and so differentials to be considered include (Krol and Krafchik, 2006):

Seborrhoeic dermatitis

A clear differentiation from seborrhoeic dermatitis of the scalp and face can be very difficult. A useful clinical clue is that infants with seborrhoeic dermatitis are often asymptomatic, while those with atopic dermatitis have itchy and irritable skin.

Contact dermatitis

A history of exposure to a contact allergen with dermatitis at the site of exposure and positive patch tests are usually found. In contrast to atopic eczema, xeroderma does not occur (Krol and Krafchik, 2006).

Scabies

Scabies can easily be confused with atopic dermatitis, particularly when secondary eczematization occurs. In scabies, burrows in the genital or axillary areas, finger web involvement and skin scraping to demonstrate live mites or eggs on microscope give the diagnosis. Another useful clue in scabies is pruritus in other family members.

Psoriasis

Early forms of psoriasis can imitate eczema and commonly involve the face in children. The well-defined localized plaques with silvery white scale on extensor surfaces, scalp and buttocks are more typical in older patients.

Treatment

General measures include the avoidance of irritants such as soap, bubble baths, fabric softeners, heat, dust, woollen or synthetic clothing, and animal dander.

Topical treatment

Emollients (moisturizers): Emollients are essential in the treatment of atopic dermatitis to help restore the skin barrier. They must be used frequently, as their effects last only for a few hours (Eichenfield et al, 2003). During bathing, an emollient should be used as a soap substitute for washing and afterwards the skin patted dry and further emollient applied liberally to moisturize the skin and prevent further water loss. Normal soaps, liquid soaps, bubble baths and washes considerably worsen dry eczematous skin and should be completely avoided.

Glucocorticoids: Topical glucocorticoids are the mainstay of treatment of acute exacerbations. There is a lot of misinformation about the use of topical steroids and most patients, parents and primary care teams will undertreat.

Steroids should be used in short courses until control of atopic dermatitis is achieved and then intermittently. Side effects are related to the potency, length of use and site of use. In infants and on the face and neck, less potent steroids should be used, while on lichenified areas high-potency treatment will often be needed. Steroids provide an anti-inflammatory effect as well as a reduction of skin colonization with *S. aureus*. Ointments are superior to creams as they are moisturizing and provide better penetration of the epidermis.

Tar preparations: Coal tar creams have helpful anti-inflammatory and anti-pruritic effects, but are underused because of the smell and tendency to stain skin and clothing. They are now used in shampoos, bath solutions and bandages.

Wraps and bandages: Wet wraps and cotton bandages are very useful when applied over topical treatment. They prolong treatment contact with the skin, cool, soothe and moisturize the skin, and protect it from the damage caused by scratching (*Figure 3*).

Topical calcineurin inhibitors: Tacrolimus ointment is as effective as potent local steroids in the treatment of atopic dermatitis and is widely used in hospital clinics. There is less evidence of the benefits of pimecrolimus, which is used in younger patients (Bigby, 2006). The main advantage is that these drugs do not cause skin thinning, and have a role in the management of patients who decline topical steroid therapy. Burning and stinging of the skin are common in the first few days of use.

Systemic treatment

Oral or topical antibiotics are important in the management of children with infected eczema. Most acute flares of eczema can be attributed to secondary infection with *S. aureus* (*Figure 4*). Intravenous antibiotics are rarely necessary even when children require hospital admission.

Ultraviolet A (UVA) and ultraviolet B light therapy, and photochemotherapy with PUVA (oral psoralen plus UVA) are useful treatment options for severe atopic dermatitis but the effect can be short lived.

Oral antihistamines provide minimal relief from pruritus but, if sedating, can help with restlessness at night.

Figure 3. Medicated bandages are useful in soothing and moisturizing the skin as well as protecting it from damage caused by scratching.

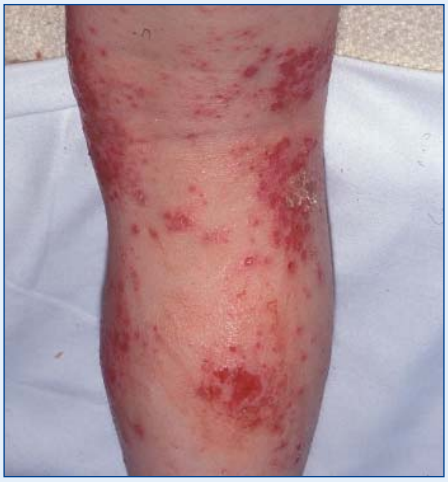


Figure 4. Secondarily infected atopic dermatitis, showing marked redness exudation and weeping of eczema at a typical site.

Systemic corticosteroids are reserved for short periods during severe flares.

Cyclosporin is very useful in severe resistant cases of atopic dermatitis. It has a rapid onset of action and markedly decreases pruritus. The side effects of hypertension and renal impairment mean it is currently only licensed for use for up to 12 months (Harper et al, 2001).

Impetigo

Impetigo (or impetigo contagiosa) is one of the most common skin infections in children; *S. aureus* and *Streptococcus pyogenes* are the causative agents. It is a highly contagious, superficial skin infection that can occur at all ages, but most commonly involves children under the age of 5 years. Impetigo is spread rapidly by direct contact and is more common in children with atopic dermatitis. Nasal carriage of organisms may predispose to recurrent infection in an individual (Sladden and Johnston, 2004).

Pathophysiology

After direct inoculation a red macule rapidly enlarges into discrete blisters or pustules. These are fragile and enlarge and rupture, releasing serous fluid before forming honey-coloured crusted plaques up to 2 cm in size (*Figure 5*). The infection expands locally and may also spread by autoinoculation. The crusts eventually dry and heal without scarring. The face (especially around the mouth and nose), the extremities and buttocks are most commonly affected. The disease can be widespread but systemic symptoms are usually absent.

Impetigo may also occur in areas of minor cutaneous trauma, such as insect bites or scratches; thus it is commonly found as a secondary infection in preexisting atopic dermatitis or scabies (Sladden and Johnston, 2004).

Diagnosis

The majority of cases of impetigo can be diagnosed clinically because of its characteristic appearance. Difficulties arise in cases of secondary impetiginization, such as atopic dermatitis, herpes simplex infections, scabies and tinea capitis, where a swab of the exudate to assist diagnosis and guide therapy is helpful.

Treatment

In mild cases, impetigo is a self-limited condition. However, treatment provides a faster recovery with fewer complications and a decreased risk of spread to others (Sladden and Johnston, 2005; Koning et al, 2007).

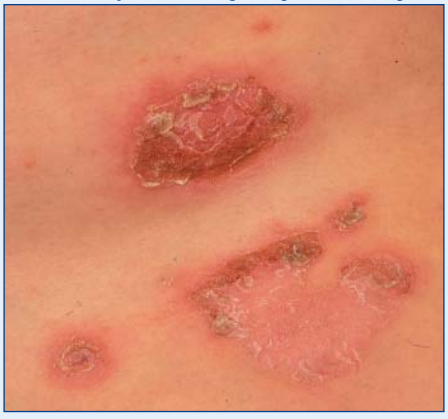
Topical antibiotics

Topical antibiotics are at least as effective as oral treatment for localized forms of impetigo. Fusidic acid cream and mupirocin ointment have proven to be equally effective and are well tolerated. They are applied three times daily for up to 10 days.

Systemic antibiotics

Oral flucloxacillin is the treatment of choice, but erythromycin or cephalosporins can be used in penicillin allergy or resistance. Systemic antibiotics are reserved for patients with extensive lesions. In some cases of bacterial resistance, coamoxiclav (amoxicillin and clavulanic acid) is effective. Systemic antibiotics should be used in addition to, not instead of, topical antibiotic treatment.

Figure 5. Impetigo: note the well-defined superficial erosions with partial healing and golden crusting.



Conclusions

Atopic dermatitis is often easy to diagnose but requires a long term multidisciplinary approach to treatment. Secondary infection and/or impetigo is common and should always be considered as a cause of exacerbations. BJHM

Conflict of interest: none.

Bigby M (2006) Tacrolimus and pimecrolimus for atopic dermatitis: where do they fit in? *Arch Dermatol* **142**(9): 1203–5

Boguniewicz M, Eichenfield LF, Hultsch T (2003) Current management of atopic dermatitis and interruption of the atopic march. *J Allergy Clin Immunol* **112:** 140–50

Eichenfield LF, Hanifin JM, Luger TA, Stevens SR, Pride HB (2003) Consensus conference on pediatric atopic dermatitis. *J Am Acad Dermatol* **49:** 1088–95

Harper JI, Berth-Jones J, Camp RD (2001) Cyclosporin for atopic dermatitis in children. *Dermatology* **203**(1): 3–6

Koning S, Verhagen AP, van Suijlekom-Smit LWA, Morris A, Butler CC, van der Wouden JC (2007) Interventions for impetigo. *Cochrane Database Syst Rev* 2007(1)

Krol A, Krafchik B (2006) The differential diagnosis of atopic dermatitis in childhood. *Dermatol Ther* **19:** 73–82

Leung DYM, Boguniewicz M, Howell MD, Nomura I, Hamid QA (2004) New insights into atopic dermatitis. *J Clin Investig* **113:** 651–7

Lui HJ, Guo ZP, Williams HC et al (2007) Topical tacrolimus for atopic dermatitis. *Cochrane Database Syst Rev* 2007(1)

Sladden MJ, Johnston GA (2004) Common skin infections in children. *BMJ* **329:** 95–9

Sladden MJ, Johnston GA (2005) Current opinions for the treatment of impetigo in children. *Expert Opin Pharmacother* **6**(13): 2245–56

Spergel JM, Paller AS (2003) Atopic dermatitis and the atopic march. *J Allergy Clin Immunol* **112:** 128–39

KEY POINTS

- Atopic dermatitis and atopic eczema mean the same thing.
- Atopic dermatitis now affects 20% of children and continues to increase.
- Do not be afraid to use high strength topical steroids in children with severe atopic dermatitis.
- The vast majority of children admitted with infected atopic dermatitis do not require intravenous antibiotics.
- A multidisciplinary approach is essential in the management of atopic dermatitis.
- Always swab infected skin before treating.