Atopic eczema can have a substantial impact on a patient’s daily living. Assessment should focus on both physical and quality-of-life aspects of the disease to ensure optimal management.

**Atopic eczema**

**clinical features and diagnosis**

By Christine Clark, PhD, FRPharmS

Atopic eczema is an inflammatory skin condition that affects all age groups, but usually starts in childhood. It is the most common form of eczema, affecting up to 20% of children and 2–10% of adults in the UK. Moreover, there has been a steady increase in the prevalence of atopic eczema over the past 30 years.

There are many clinical variants of eczema (see Box 1, p286) but the common features are red, itchy, sore and inflamed skin. The terms “eczema” and “dermatitis” are now used interchangeably (see Box 2, p289).

Atopic eczema can have a substantial negative impact on quality of life for both the sufferer and his or her family — an Australian study showed that caring for children with moderate-to-severe atopic eczema was more stressful than caring for children with type 1 diabetes.

Inability to sleep due to severe itching means that schoolwork and home life are disrupted and, for some people, eczema affecting the hands also interferes with their ability to work. Additionally, the erroneous belief that eczema is contagious can prompt negative reactions to the condition from other people.

**The epidermal barrier**

The skin has two main layers: the dermis and the epidermis.

The dermis is 3–5mm thick and contains blood vessels, hair follicles and sweat glands.

The epidermis is the surface layer which varies in thickness from about 0.06mm on the eyelids to 0.8mm on the palms and soles of the feet. The epidermis is composed of four layers of densely packed keratinocytes (skin cells). Keratinocytes are continually formed in the basal layer and gradually move upwards to the stratum corneum. As they move they change progressively from plump, nucleated cells to flattened, dead cells that are shed. This process takes about 28 days.

Several factors contribute to the formation of the epidermal barrier. The uppermost layer of the epidermis (stratum corneum) can be visualised as a brick wall where the cells (now known as corneocytes) are the bricks. They are held together by mortar made up of intercellular lipids that are extruded from the maturing cells (see Figure 1, p286).

Soap should be avoided by people with eczema.

Atopic eczema (or atopic dermatitis) is an inflammatory, itchy skin condition that follows a relapsing and remitting course. It usually starts in early childhood and is often caused by a genetic defect that leads to a breakdown of the skin barrier.

Trigger factors, such as irritants and allergens, can precipitate flares of eczema or make the condition worse. Although atopic eczema is often not considered to be a serious medical condition, it can have a substantial impact on quality of life for patients and carers.

**SUMMARY**

Atopic eczema is an inflammatory, itchy skin condition that follows a relapsing and remitting course. It usually starts in early childhood and is often caused by a genetic defect that leads to a breakdown of the skin barrier.

Trigger factors, such as irritants and allergens, can precipitate flares of eczema or make the condition worse. Although atopic eczema is often not considered to be a serious medical condition, it can have a substantial impact on quality of life for patients and carers.

Soap should be avoided by people with eczema.

**Christine Clark** is a freelance journalist and chairman of the Skin Care Campaign, a UK organisation representing the interests of people with skin diseases.

E: chris@salt.u-net.com
known as the epidermal barrier and it serves to prevent excessive water loss from healthy skin and to prevent the entry of allergens and irritants.

Pathophysiology
Atopic eczema appears to be caused by genetically determined defects in the epidermal barrier of the skin, which increase the susceptibility of the skin to damage from environmental factors. Such damage allows the entry of allergens and irritants that trigger immune and inflammatory responses. Therefore, some experts have described eczema as the result of a gene-environment interaction.

In atopic eczema, the intercellular lipids are not formed normally, which reduces the effectiveness of the epidermal barrier. There is increased water loss from the stratum corneum causing the corneocytes to shrink; cracks then open up between the cells. The result is dry skin, which can neither retain water effectively nor prevent the incursion of irritants or allergens.

Two genetic variations have been identified recently that go some way towards explaining these changes. The first is a genetic filaggrin deficiency which leads to a poorly formed stratum corneum that is prone to water loss. It is estimated that filaggrin gene defects are present in one in 10 Europeans.

Another genetic defect leads to high levels of a skin protease called stratum corneum chymotryptic enzyme — this is also associated with atopic eczema. Furthermore, raising the skin pH from 5.5 to 7.5, for example (as happens when washing with soap), results in a doubling of protease activity.

Similar changes can also be seen in normal skin when some of the epidermal lipids are removed by repeated use of surfactants or solvents. The use of soap not only removes natural oils from the skin, making it feel dry, it also increases shedding of skin cells.

People with atopic eczema are more sensitive to the detrimental effects of soap than people without the condition. The absence of visible eczema in a particular area does not alter this — a lower threshold for irritation remains even if the skin appears “normal”.

Current thinking suggests that when irritants and allergens penetrate the weakened epidermal barrier they trigger immune responses, including the release of pro-inflammatory cytokines. The problems are further exacerbated by scratching, which relieves itching temporarily but further damages the skin and can itself trigger further release of inflammatory mediators, thereby increasing inflammation and itching and perpetuating the cycle (the “itch-scratch cycle”).

Diagnosis
A diagnosis of atopic eczema is made with the presence of an itchy rash plus three or more of the following:

- Visible flexural dermatitis (or visible dermatitis on the cheeks or outer aspects of the limbs in children)
- Personal history of flexural dermatitis (or dermatitis on the cheeks in children under 10 years of age)
- Personal history of dry skin in the past 12 months
- Personal history of asthma (or history of atopic disease in a first-degree relative for children)
- Onset of signs and symptoms under the age of two years (this criterion should not be used in children under four years of age)

Minor changes to the diagnostic criteria for children were made in the 2007 National Institute for Health and Clinical Excellence guidance for atopic eczema in children.

Acute eczema can be accompanied by exudation and crusting; while chronic eczema lesions are dry, lichenified and fissured.

Other dermatological conditions can be mistaken for eczema. Scabies can look like eczema and the severe itching that accompanies established scabies infestation adds to the confusion. Scabies and head lice can also precipitate local flare of eczema. Psoriasis can sometimes look like eczema, but psoriasis plaques are usually found on extensor (outside) surfaces whereas eczema, in adults, more commonly affects flexor (inside) surfaces. Fungal infections and rosacea can also mimic the appearance of eczema.

**Box 1: Other types of eczema**

<table>
<thead>
<tr>
<th>TYPE OF ECZEMA</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritant contact</td>
<td>Triggered by contact with irritant substances (eg, shampoo, detergents)</td>
</tr>
<tr>
<td>Allergic contact</td>
<td>Triggered by contact with allergens (eg, chromate, nickel, perfumes, preservatives)</td>
</tr>
<tr>
<td>Seborrhoeic</td>
<td>Typically affects scalp, eyebrows and ears, but can also affect axillae. Characteristic greasy yellow scales. Associated with <em>Pityrosporum</em> spp overgrowth</td>
</tr>
<tr>
<td>Gravitational (varicose)</td>
<td>Associated with oedematous legs. Skin is fragile and can ulcerate if scratched</td>
</tr>
<tr>
<td>Asteatotic</td>
<td>Occurs on the legs of elderly patients where the skin is very dry. Appear as fine, red, superficial fissures</td>
</tr>
<tr>
<td>Pompholyx</td>
<td>Presents with vesicles or large blisters on the palms, fingers or soles of the feet</td>
</tr>
<tr>
<td>Discoid</td>
<td>Multiple coin-shaped, itchy lesions, typically found in middle-aged men. Thought to be stress-related.</td>
</tr>
<tr>
<td>Chronic hand</td>
<td>Erythema, vesicles, papules, scaling, fissures, itching and pain affecting the hands. Can be incapacitating</td>
</tr>
</tbody>
</table>
Assessment
Experts recommend that assessment of a patient with eczema should embrace both the physical aspects of the condition and its impact on quality of life. The NICE guideline for the management of atopic eczema in children outlines a severity grading scheme, incorporating both physical and quality-of-life assessments (see Box 3).

Clinicians should always conduct both physical and quality-of-life assessments because even mild eczema can affect a patient’s well-being.

Course of disease
Atopic eczema commonly starts in early childhood, but it can also start later in life. Like other inflammatory skin diseases it runs a relapsing and remitting course with the severity often varying from day to day. The “International study of life with atopic eczema” (ISOLATE)8 showed that, on average, patients experienced nine flares per year, each lasting for 15 days. Overall, patients spent an average of 136 days per year experiencing flares.

Complications
A common complication of atopic eczema is bacterial infection with Staphylococcus aureus, leading to impetigo. Eczematous skin is almost always colonised with S aureus but treatment is only required when there is evidence of infection (eg, worsening inflammation, weeping, pustules, crusting, eczema failing to respond to treatment, rapidly worsening eczema or, in severe cases, fever and malaise).

People with eczema are more susceptible to infection with viruses, such as those causing warts and molluscum contagiosum.

Infants and young children with eczema can develop widespread lesions if infected with Herpes simplex (see Figure 2). This condition, known as eczema herpeticum, requires urgent referral for medical attention because it can be life-threatening. It is associated with:

- Areas of rapidly worsening, painful eczema
- Possible fever, lethargy or distress
- Clustered blisters that look like early-stage cold sores
- Uniform, punched-out erosions (usually 1–3mm diameter) which may coalesce

Parents should be warned of the dangers of contact with anyone who has H simplex or cold sores.

The atopic march
Atopic eczema often develops as part of a wider pattern of atopic conditions — this is known as the “atopic march”. Gastrointestinal symptoms (commonly due to an allergy to milk and eggs) occur in the first few months of life. This is followed by atopic eczema, often starting within the first three months. Later during childhood, asthma develops and then allergic rhinitis. The factors responsible for the atopic march are not fully understood but it is thought that the defective skin barrier seen in atopic eczema could play a key role.1

References

Box 2: Key points about atopic eczema
- The terms eczema and dermatitis are interchangeable
- Atopic eczema is the most common form of eczema
- The common clinical feature is red, itchy, inflamed skin
- Eczema can have a significant impact on quality of life
- The severity of eczema often varies from day to day
- Acute eczema can be accompanied by exudation and crusting, while chronic eczema lesions are dry, lichenified and fissured

Box 3: Assessment of atopic eczema

<table>
<thead>
<tr>
<th>GRADE</th>
<th>PHYSICAL ASSESSMENT</th>
<th>IMPACT ON QUALITY OF LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear/none</td>
<td>Normal skin; no evidence of atopic eczema</td>
<td>No impact</td>
</tr>
<tr>
<td>Mild</td>
<td>Areas of dry skin; infrequent itching (with or without small areas of redness)</td>
<td>Little impact on everyday activities, sleep and social well-being</td>
</tr>
<tr>
<td>Moderate</td>
<td>Areas of dry skin; frequent itching; redness (with or without excoriation and localised skin thickening)</td>
<td>Moderate impact on everyday activities and psychosocial well-being; frequently disturbed sleep</td>
</tr>
<tr>
<td>Severe</td>
<td>Widespread areas of dry skin; incessant itching; redness (with or without excoriation, extensive skin thickening, bleeding, oozing, cracking and altered pigmentation)</td>
<td>Severe limitation of everyday activities and psychosocial functioning; nightly loss of sleep</td>
</tr>
</tbody>
</table>