Erythroderma: 90% skin failure

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Erythroderma is a life-threatening state of skin failure. This dermatological emergency often presents to an acute medical unit or accident and emergency department. Effective initial management is vital.

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Erythroderma is defined as inflammation of the skin affecting at least 90% of the body surface (*Figure 1*). This is usually associated with a significant breakdown of skin function and is a common dermatological emergency.

Erythroderma may develop extremely rapidly or quite gradually. In either event it can present to physicians in a range of medical disciplines. Initial management may take place in the community. Patients often present to an accident and emergency department or acute medical unit. Preliminary hospital management is therefore often undertaken by physicians and paediatricians receiving acute admissions.

This review article is intended to provide a guide to the diagnosis and initial management of these cases for the non-specialist.

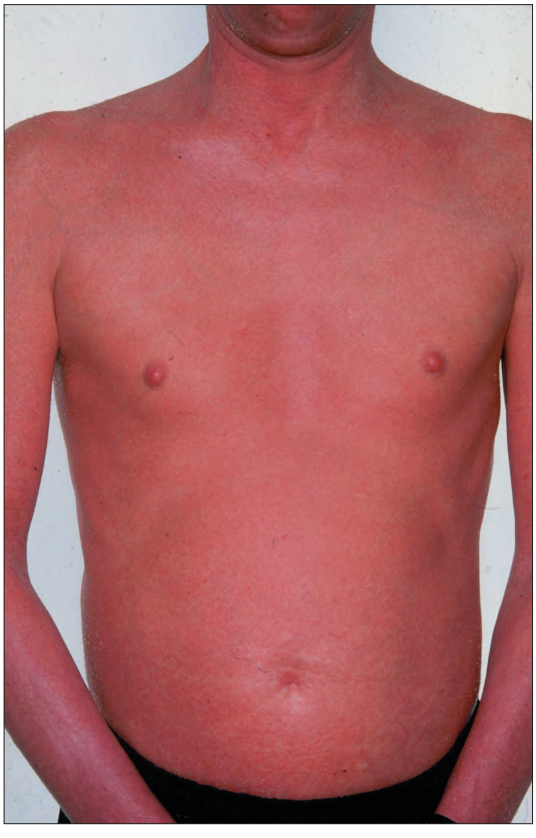

Figure 1. Erythroderma: inflammation of at least 90% of the skin surface.

AETIOLOGY

Virtually any inflammatory dermatosis may result in erythroderma (Hasan and Jansen, 1983; Alonso-Llamazares et al, 1998). This state can therefore be regarded as a common 'end stage' of severe skin disease. The commonest causes include various kinds of eczema or dermatitis, psoriasis and, most importantly, drug reactions (Boyd and Menter, 1989; Botella-Estrada et al, 1994). Eczema of any variety may progress to erythroderma even if the initial cause is localized, as in the case of venous (stasis) eczema which begins on the legs. In many cases the cause is by no means obvious, especially on presentation, and some cases of erythroderma remain idiopathic even after extensive investigation. The numerous potential causes of erythroderma are listed in *Table 1*. This table includes several of the drugs most commonly responsible but should not be regarded as a complete list. The use of herbal remedies such as St John's wort may also trigger this reaction (Holme and Roberts, 2000).

Occasionally erythroderma may develop as a manifestation of a systemic disease such as dermatomyositis, systemic lupus or internal malignancy (King et al, 1986; De Spain and Clark, 1988; Pierson and Taylor, 1993). The commonest malignancy causing erythroderma is cutaneous T cell lymphoma, followed by Hodgkin's disease and rarely non-Hodgkin's lymphoma, leukaemias and myelodysplasia (Rosen et al, 1979).

CLINICAL PRESENTATION

In general, males are more often affected than females and, if the hereditary disorders and atopic dermatitis are excluded, most patients are over 45 years old. In some cases the onset is sudden and the inflammation is rapidly progressive, becoming severe over just a few hours. This is particularly true in the case of drug-related erythroderma. Cases resulting from a pre-existing inflammatory dermatosis usually develop more

gradually although in severe flares of atopic eczema or severe contact allergy this can happen over 24–48 hours.

Generalized erythema is a constant feature of erythroderma, while scaling and desquamation are highly variable. Patients often complain that the skin feels tight. Itching is also variable and very severe itching is sometimes a clue to the presence of a lymphoma.

Careful examination can often reveal signs of an underlying skin disorder such as psoriasis or lichen planus. The inflamed skin is often shiny. The scales can be fine in chronic cases but may be larger in patients with sudden onset of erythroderma. Palms and soles may be affected. In very chronic cases there may be pigmentary disturbances, especially in patients with pigmented skin, in whom patchy or widespread loss of pigment may occur. Mucous membranes are usually spared although ectropion, resulting from oedema, is common. Hair loss occurs in some cases and many develop dystrophic nails.

TABLE 1.
Causes of erythroderma

Dermatitis	Atopic
	Allergic contact
	Venous (stasis, gravitational)
	Seborrhoeic
Other skin disease	Bullous pemphigoid
	Cutaneous T cell lymphoma
	Dermatophytosis
	Ichthyoses
	Lichen planus
	Pityriasis rubra pilaris
	Pemphigus foliaceus
	Psoriasis
Systemic disease	Dermatomyositis
	Lupus erythematosus
	Sarcoidosis
	Graft *vs* host disease
Malignancy	Lymphoma and leukaemias
Drugs	Allopurinol
	Amiodarone
	Antibiotics
	Antimalarials
	Antituberculous drugs
	Aspirin
	Captopril
	Carbamazepine
	Cimetidine
	Diltiazem
	Diphenylhydantoin (phenytoin)
	Gold
	Lithium
	Sulfonylureas
	Thiazides

Lymphadenopathy occurs to some degree in most cases. This usually resolves when the erythroderma settles down unless there is an underlying lymphoma. It is important that lymphadenopathy secondary to cutaneous inflammation (known as dermatopathic lymphadenopathy) is not mistaken for lymphoma (Bernengo et al, 1981). In difficult cases, lymph node biopsy may be advisable, but the pathologist must be told that the patient is erythrodermic for a reliable histological interpretation to be made.

Peripheral oedema is usually caused by increased capillary permeability but may be indicative of high output cardiac failure. Tachycardia is usually present. The loss of thermoregulation which results from cutaneous vasodilatation leads to rapid heat loss from the skin (Fox, 1967). Shivering and hypothermia may occur even though the skin may still feel deceptively warm. In other cases pyrexia may be present and may represent another manifestation of a drug reaction or may be indicative of infection. Septicaemia is a life-threatening complication resulting from impaired skin barrier function. This may develop suddenly and may be rapidly fatal, especially in the elderly.

In chronic severe erythroderma when the entire body surface is affected the descriptive term ‘red man syndrome’ is often applied (Thestrup-Pederson et al, 1988).

INVESTIGATIONS AND MANAGEMENT

The most vital steps to determine the cause of erythroderma are a careful history and review of the case notes. Special attention needs to be paid to an accurate drug history and this should include all over-the-counter and herbal medicines (Berth-Jones, 2002).

Newly developed erythroderma and unstable patients are best managed in hospital as frequent monitoring and intensive supportive care are needed. Bed rest can also be highly therapeutic.

Useful investigations include a full blood count, liver function tests, electrolytes, serum protein levels, blood cultures, and nasal and skin swabs from skin for bacterial culture and sensitivity. Further investigations may be necessary depending on initial findings. Peripheral blood sample for Sezary cells is an important investi-

gation. However, caution should be exercised when interpreting the Sezary cell count and size of the cells since many conditions other than the cutaneous T cell lymphoma can give positive results. When these cells constitute more than 20% of peripheral mononuclear cells it becomes diagnostic.

T cell receptor gene analysis to demonstrate clonal proliferation of lymphocytes has greater diagnostic value (Russell-Jones and Whittaker, 1999). Skin histology can be helpful in selected cases and immunofluorescent staining for immunoglobulin deposition should be performed if an immunobullous disease is suspected. Sometimes multiple skin biopsies may be required before the subtle changes of early cutaneous T cell lymphoma become apparent. Topical steroids should ideally be stopped 2 weeks before skin biopsy to prevent them masking the histological features. However, in other cases the histological features remain non-specific.

The impact of erythroderma on other systems is potentially fatal (Zoon and Mali, 1957). The very young and the elderly are at most risk. Heat loss can result in hypothermia so monitoring of body temperature is mandatory. The increased cardiac output resulting from cutaneous vasodilation can result in cardiac failure, a particular hazard in patients with preexisting cardiac conditions. Fluid and protein are lost from the dilated cutaneous capillaries leading to dehydration and hypoalbuminaemia. Careful management of fluid balance may therefore be required.

All non-essential drugs should be stopped. Frequent and large quantities of simple bland emollients should be applied to the skin by the nursing staff. Apart from soothing the skin the emollients improve the itching and partially restore the skin barrier. Oral antibiotics are often used prophylactically and *Staphylococcus aureus* is the most important pathogen to cover.

Topical steroids are often used to control the inflammation. Topical therapy may be more irritant than in normal skin and the absorption will be greater. Care should therefore be exercised with the quantities of topical medicaments. Antihistamines can be very useful as sedatives although they probably have little effect on pruritus. Definitive treatment depends on the diagnosis. For psoriatic erythroderma systemic retinoids can be useful, and phototherapy and systemic immunosuppressant drugs may be indicated for eczematous erythroderma (Roeder and Driesch, 1999).

When specific diagnosis is not possible, treatment can be directed at the most likely cause, based on supportive findings.

KEY POINTS

- Erythroderma causes 'skin failure' and requires urgent treatment.
- Many dermatoses and systemic disorders can cause erythroderma.
- Acute cases need hospital management with intensive monitoring and treatment.
- Plentiful applications of emollients can often produce dramatic improvement of erythroderma.
- Without proper early management lives may be lost even in young adults.

PROGNOSIS

The prognosis of erythroderma depends on many variables including the underlying cause, age, speed of onset, concomitant medical conditions, early effective treatment and the development of complications. With careful management the vast majority of patients who are otherwise healthy will survive an episode of erythroderma. While many cases settle rapidly over the course of a few days, others may persist for months or years and some recover only to relapse from time to time often without apparent cause. Drug-induced erythroderma in young adults has the best prognosis. HM

Conflict of interest: none.

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