SKIN FOCUS

ME Docrat, *MB ChB, MMed (Derm)*

Dermatologist, Wale Street Chambers, c/o Wale and Long Streets, Cape Town, South Africa

ICHTHYOSIS

Patients with both ichthyosis vulgaris and X-linked ichthyosis consulted me recently and thus a review of these two conditions seems appropriate.

The ichthyosiform dermatoses are characterised by an excess accumulation of cutaneous scale. The majority of this group are hereditary disorders. Acquired ichthyosis is associated with underlying medical disorders.

Ichthyosis vulgaris

Ichthyosis vulgaris (IV) is a common disorder of cornification (Fig. 1). It is characterised by mild generalised hyperkeratosis (scaling) and xerosis (dry skin), which may be of cosmetic concern to many patients. Some patients may also have pruritus.

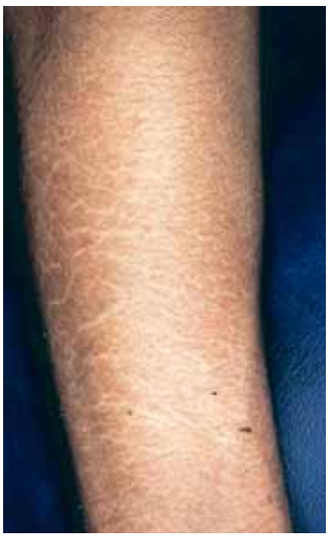

Fig. 1. Ichthyosis vulgaris presenting on the limbs.

IV is inherited as an autosomal dominant condition with a high prevalence rate of 1/300 people. It starts at the age of 3 months and is commonly associated with atopy (atopic dermatitis, allergic rhinitis and asthma) – 50% of patients with IV have atopic dermatitis.

Pathogenesis

Chemical studies have shown a reduction in profillagrin. Scale formation results from the loss of water-containing amino acids that derive from fillagrin catabolism.

Clinical findings

The diagnosis is made on clinical findings – white flaky scales on a background of dry skin. Although there is diffuse involvement, the fish-scale pattern is more pronounced on the lower legs. The skin colour is normal as compared to X-linked ichthyosis. The face is spared. IV is frequently associated with keratosis pilaris which presents with follicular hyperkeratosis. There may be palmer-planter hyperkeratosis and the skin markings are accentuated (hyperlinear).

Correspondence: Dr ME Docrat, Wale Street Chambers, c/o Wale and Long Streets, Cape Town 8001. Tel 021-423-3180/90, e-mail medocrat@intekom.co.za

Differential diagnosis

IV needs to be differentiated from xerosis, X-linked ichthyosis and lamellar ichthyosis. X-linked ichthyosis can be differentiated by larger, darker scales and involvement of the neck and flexures (Fig. 2). Biochemical testing of patients with X-linked ichthyosis reveals deficiency of steroid sulphatase.

Acquired ichthyosis may present with similar clinical findings to IV. However acquired ichthyosis occurs late in life and may be a para-neoplastic disorder associated with Hodgkin's lymphoma, mycosis fungoides, carcinoma of the breast, lungs and cervix. Acquired ichthyosis associated with underlying lymphoma clears with effective anti-cancer treatment and may be an early marker of subsequent recurrence.

Acquired ichthyosis may also be associated with non-malignant disease including sarcoidosis, hypothyroidism, leprosy, malnutrition, malabsorption and essential fatty acid deficiency. Drugs which cause acquired ichthyosis include cholesterol-lowering agents such as triparanol and nicotinic acid.

Laboratory findings

In view of the fact that IV is a clinical diagnosis, special investigations are not usually required. Occasionally a biopsy may be done to differentiate IV from inflammatory dermatoses and widespread epidermal dermatophyte infection. However patients presenting with acquired ichthyosis need to be investigated for underlying pathology. Also, if sarcoidosis is suspected in a patient with acquired ichthyosis, a biopsy of the ichthyosis area should be performed. If histology shows granulomas, then sarcoidosis is confirmed.

Dermatopathology

This reveals orthokeratotic hyperkeratosis and reduced or absent granular layers. Electron microscopy demonstrates small, poorly formed keratohyaline granules.

Cause and prognosis

Symptoms of IV improve in the summer months and with increasing humidity. It also improves with advancing age. However IV worsens in a dry, cold environment.

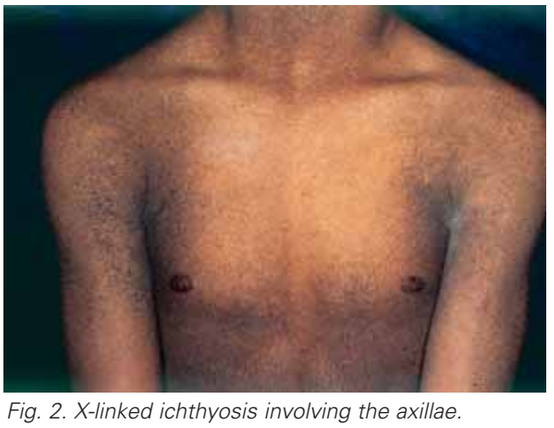

Fig. 2. X-linked ichthyosis involving the axillae.

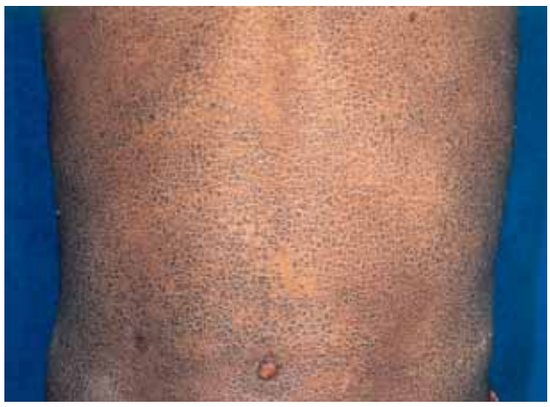

Fig. 3. X-linked ichthyosis presenting with dark-brown scales on the chest and abdomen.

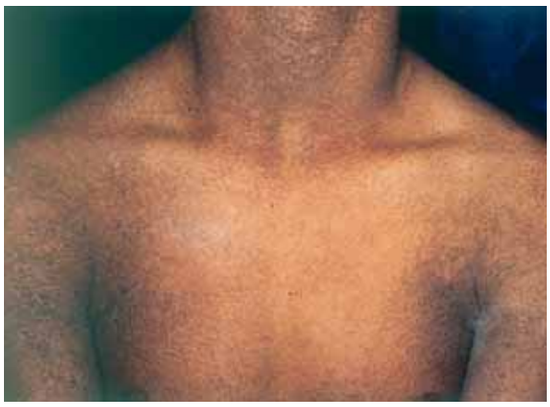

Fig. 4. X-linked ichthyosis, involvement of the neck with brown scales has resulted in the term 'dirty neck disease'.

Treatment

The mainstay of treatment is reduction of scaling through continued use of lubricants and emollients. Hydration of the stratum corneum is achieved by immersion in hydrating oils followed by the application of liberal quantities of petrolatum.

Urea-containing creams such as Nutraplus (10%) act as humectants by binding water in the stratum corneum. Ceramide-containing lipid creams (Physiogel) are also effective.

Keratolytic agents such as 6% salicylic acid in propylene glycol are effective in helping to exfoliate the diffuse scale. Also alpha hydroxy creams such as lactic acid (Hydra-lac lotion) bind water and control scaling. Topical retinoids are also helpful but may be of limited value because they can cause irritation.

Systemic retinoids (acitretin and isotretinoin) are reserved for very severe cases of lamellar ichthyosis. Careful monitoring for toxicity is required. Severe cases may require intermittent therapy over long periods of time.

X-linked ichthyosis (steroid sulphatase deficiency)

X-linked ichthyosis is a recessive disorder that affects males only with an incidence of 1/6 000 male births. It is transmitted by female carriers. Prenatal diagnosis is possible.

Pathogenesis

The decrease in steroid sulphatase activity is caused by deletion of the STS gene on chromosome Xp22.32. Steroid sulphatase deficiency results in impaired hydrolysis of cholesterol sulphate and dehydroepiandrosterone sulphate (DHEAS). This leads to accumulation of cholesterol-3-sulphate in the epidermis. This, in turn, leads to increased cellular adhesion and clinically hyperkeratosis, while both have an effect on skin barrier function.

Clinical features

X-linked ichthyosis presents after birth with peeling of large scales. X-linked ichthyosis is clinically distinct from IV in that large dark-brown polygonal adherent scales develop during infancy. Distribution is on the neck, trunk and extremities (Fig. 3). Involvement of the neck has resulted in the term 'dirty neck disease' (Fig. 4). The palms, soles and face are spared. Although X-linked ichthyosis improves in the summer months, in contrast to IV, there is no improvement with age. Some patients may present with extracutaneous abnormalities such as testicular maldescent and testicular carcinoma. Corneal opacities occur in 50-100% of adult patients.

Dermatopathology

There is hyperkeratosis but the granular layer is present in contrast to IV.

Treatment

Like for IV, the same principles apply to treatment of X-linked ichthyosis. Daily emollient application, as well as the use of urea and alpha hydroxy acid creams, is helpful.

Although two types of ichthyosis, viz. ichthyosis vulgaris and X-linked ichthyosis have been discussed, there is a wide spectrum of ichthyosiform dermatoses which are related to various syndromes.

Declaration of conflict of interest

The author declares no conflict of interest.

ACKNOWLEDGEMENTS AND FURTHER READING

Champion RH, ed. *Rook, Wilkinson, Ebling. Textbook of Dermatology*, Vol. 2, Chapter 34. Oxford: Blackwell Science, 1988: 1487 – 1588.

Paller AS, Mancini AJ, Herwitz I. *Clinical Pediatric Dermatology* (A textbook of skin disorders of childhood and adolescence). 3rd ed., Chapter 5: New York: Elsevier Saunders, 2006: 107 – 127.

Bolognia JL, Jorizzo JL, Rapini RP. *Dermatology* Vol. 1. Philadelphia: Mosby, 2003: 775 – 821.

Fitzpatrick TB, Johnson RA, Wolf K, Polano MK, Surmond D. *Color Atlas and Synopsis of Clinical Dermatology*. 3rd ed. New York: McGraw-Hill, 1983: 96 – 101.

Kane KS, Ryder JB, Johnson RA. *Color Atlas and Synopsis of Pediatric Dermatology*. New York: McGraw-Hill, 2002: 96 – 99.