

Bullous ichthyosiform erythroderma: case presentation

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Abstract Bullous Ichthyosiform Erythroderma (BIE) is a rare disorder of keratinization (mutation in either keratin 1 or 10). It typically presents with fragile skin, which gives way to gradual evolution of hyperkeratosis. Flaccid blisters, peeling and superficial erosions at sites of minor trauma or friction are apparent within the first few hours of life. Yellow-brown, waxy, ridged or corrugated scale builds up in skin creases, sometimes forming spiny (Hystrix) outgrowths. Cobblestone-like keratoses occur at other sites such as the dorsal hands and feet and over the trunk. We report an 11-year-old boy with a generalized hyperkeratosis on the neck, trunk, extremities and scalp.

Key words

Bullous ichthyosiform erythroderma, hystrix, keratinization disorder.

Introduction

Bullous ichthyosiform erythroderma (BIE) is a rare disorder of keratinization. It is also known as epidermolytic hyperkeratosis.¹ BIE is transmitted as an autosomal dominant trait with a prevalence of approximately 1 in 200,000 to 300,000 persons. However, there is a high frequency of spontaneous mutation, and as many as one-half the cases have no family history and represent new mutation events. Both genders are affected equally.² A number of BIE families have been studied and found to have mutations in either keratin 1 or 10.³ These keratins are expressed in the differentiated spinous and granular layers of the epidermis, which are the sites of disease pathology in this disorder. K1a I mutations are usually associated with severe palmoplantar keratoderma, whereas KRT10 mutations spare the palms and soles because this gene is not expressed in these locations.⁴ Pathogenic mutations leading to non-

conservative amino acid substitutions cluster at the boundaries of the α -helical rod region.⁵ The characteristic histological features of BIE, hyperkeratosis with lysis and tonofilament clumping in granular layer keratinocytes, are termed 'epidermolytic hyperkeratosis' and in some countries this term is also used to define the clinical picture.² BIE typically presents with epidermolysis (fragile skin), which gives way to gradual evolution of hyperkeratosis. A mild generalized erythroderma is present at birth. Flaccid blisters, peeling and superficial erosions at sites of minor trauma or friction are apparent within the first few hours of life. Yellow-brown, waxy, ridged or corrugated scale builds up in skin creases, sometimes forming spiny (hystrix) outgrowths. Cobblestone-like keratoses occur at other sites such as the dorsal hands and feet and over the trunk.^{6,10}

Case report

An 11-year-old boy presented with a generalized hyperkeratosis. This complaint had started with generalized erythroderma, flaccid blisters and erosions without scarring at birth. Past medical, family and surgical histories were negative. He

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Figure 1 Cobblestone-like keratoses (around the neck, trunk, extremities and scalp).



Figure 2 Hystrix scales in flexures.

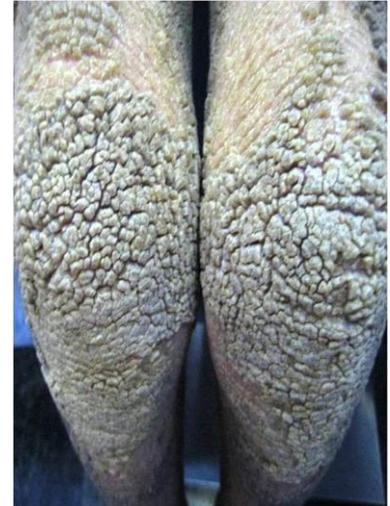


Figure 3 Cobblestone-like keratoses on knees.

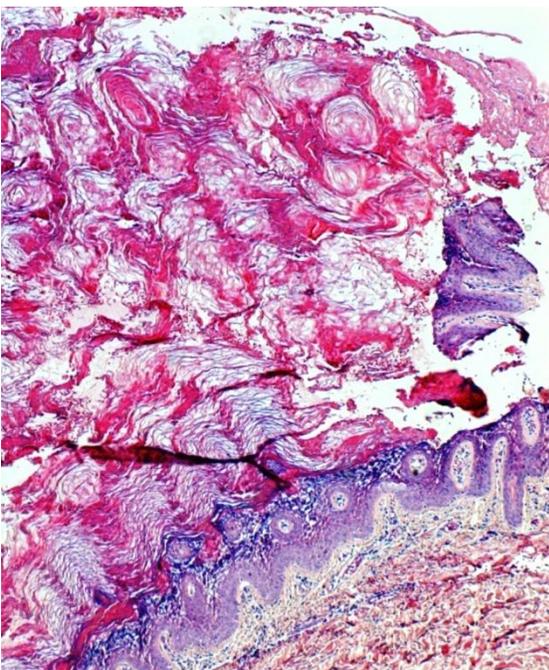


Figure 4 Marked acanthosis, hyperkeratosis and vacuolar changes in the spinous and granular layer (epidermolytic hyperkeratosis).

was not any medications and he had no allergies. Physical exam revealed generalized verrucous hyperkeratosis which covered all of the body except palms and soles. It was generalized

(around the neck, trunk, extremities and scalp). Yellow-brown scales built up, forming spiny hystrix out growths. The central face was mildly affected but scalp involvement was severe and caused patchy alopecia. Biopsy was consistent with marked epidermal acanthosis and hyperkeratosis, inter and intracellular spaces as a result of suprabasal cytolysis and multiple perinuclear vacuoles and large clumped keratohyalin granules in the spinous and granular layers (**Figure 4**). He was treated with acitretin 25mg/day, emollients and urea 10%. The lesions had completely healed about six weeks post treatment without scarring.

Discussion

BIE is a rare autosomal dominant disorder of keratinization that starts at birth.¹ Frequent misdiagnoses include epidermolysis bullosa, cutaneous mastocytosis, zinc deficiency, staphylococcal scalded skin syndrome, herpetic infection and incontinentia pigmenti. In the past many of these infants developed severe

infection, dehydration and malnutrition leading to a considerable mortality, therefore its diagnosis is important. Prenatal diagnosis, based on identification of the characteristic ultrastructural changes on fetal skin biopsy, has traditionally been performed at around 20 weeks' gestation, with ultrasound-guided fetoscopy.¹¹ Tonofilament clumping is the earliest morphological abnormality, occurring during the second trimester, and precedes the formation of keratohyalin granules and stratum corneum.¹² First trimester prenatal diagnosis is based on DNA screening by direct gene sequencing to identify specific K1 and K10 gene mutations in chorionic villus samples.^{13,14}

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