Harlequin Baby

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Introduction

Harlequin ichthyosis (HI) is a rare genetic disorder with severe erythrodermic ichthyosis that causes a distinctive and alarming appearance at birth. It is most severe form of congenital ichthyosis, characterized by a thickening of the keratin layer in fetal human skin [1]. The skin contains massive, diamond shaped scales which greatly limits the child's movement. The skin is easily pregnable by bacteria and other contaminants resulting in serious risk of fatal infection. Dehydration, respiratory failure and hypothermia are the other causes of increased mortality, seen in these cases. In addition, the eyes, ears, mouth and other appendages may be abnormally contracted. Here we report a case of HI, which was managed and started successfully on breast feeds.

Case Report

A 34-36 week preterm (AGA) female baby was born with characteristic appearance that immediately prompted a diagnosis of harlequin ichthyosis. This was the first baby born to the primigravida mother, out of consanguinous marriage. Antenatal check-ups and USG did not show any abnormality. The skin of the baby was split into plaques of rigid fixed skin, separated by deep red fissures (Fig. 1). Her facial features were obliterated by thickened skin, undeveloped nose and pinna, severe ectropion and eclabium. Hands and feet were tight and constricted, fingers and toes were hypoplastic with tapered distal ends which were held in flexed contractures like 'mittens'. Movements were restricted and sucking was ineffectual. There was no seizure/ CNS depression/ systemic abnormalities.

Supportive management in the form of hydration, emollients, orogastric feeding and prophylactic antibiotics was carried out. Umbilical cannulation was required for intravenous access. Close monitoring of respiration, temperature, fluid and electrolyte status was done. The baby had uneventful course in hospital, and was started on full breast feeds after seven days of life (Fig. 2). After the initial weight loss of approximately 20%, the baby started gaining weight and was discharged on day 20 of life. The baby is on

regular follow up and is being treated with oral retinoids (acitretin at dose of 1 mg/ kg/ day), eye and skin emollients.

Discussion

The name harlequin is derived from the dress of harlequin clowns (resembling the costume of Arlecchino) that have diamond like patches similar to the plaques seen on the skin of the affected babies. With increasing survival, the term "harlequin fetus" has been replaced by HI [1]. It is also called 'ichthyosis congenita' or 'keratosis diffusa foetalis'. It is the most severe form of congenital ichthyosis, with autosomal recessive inheritance. The underlying genetic abnormality has been identified as a mutation in the lipid-transporter gene *ABCA12* on chromosome 2 [2,3]. Incidence is 1 in 1 million births and more than 100 cases have been reported so far [4]. Survival rate is 50%, and death is usually due to dehydration (hypernatremic), sepsis, respiratory failure, hypothermia, hypoglycemia and renal failure [4]. While death within the first week was considered inevitable till the 1980s, several survivors have been reported now, especially after improvement in care due to use of oral retinoids. Patients who survive manifest a debilitating, persistent ichthyosis similar to other autosomal recessive ichthyosis, such as lamellar ichthyosis or nonbullous congenital ichthyosisform erythroderma.

Clinical features include severe cranial and facial deformities. The ears and nose may be very poorly developed or absent entirely. The eyelids are severely everted (ectropion), which leaves the eyes and the area around them very susceptible to trauma. They often bleed upon birth. The lips are pulled by the dry skin and fixed into a wide grimace (eclabium). Arms, feet, and fingers are almost always deformed in such a way that they cannot bend properly, and may be hypoplastic.

The condition can be diagnosed in-utero by fetal skin biopsy, amniocentesis or chorionic villus biopsy (for early DNA-based diagnosis) and 3D ultrasonography. Pre-implantation genetic testing can also be done [5].

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Figs. 1 & 2 : Typical features of harlequin baby with splitting of skin into plaques, separated by deep red fissures; obliterated facial features with thickened skin, undeveloped nose and pinna; severe ectropion and eclabium.

Postnatally, diagnosis is made by the pathognomic appearance, and can be confirmed by skin biopsy from any cutaneous sites, which show characteristic abnormalities in the structure of lamellar granules and in the expression of epidermal keratin.

Present treatment primarily entails the use of humidified incubator, temperature regulation, nutrition replacement, skin and eye care, pain control, physiotherapy, and infection control [6]. Topical keratinolytics frequently used in adulthood (salicylic acid, alpha hydroxyl acids and urea) are not appropriate in the neonatal period due to potential systemic toxicity from increased cutaneous absorption. Moreover, as systemic retinoid therapy achieves adequate keratinolysis, these potentially toxic topical agents are largely unnecessary. Also, bathing and soaking can reduce the risks of skin infection, replenish moisture in the skin and promote the softening and shedding of the thick stratum corneum. The deep cutaneous fissures of HI are very painful, making pain management an important issue in the care of these patients. Ectropion is managed with artificial tears applied to the eye and exposed conjunctiva every 2 hour and antibiotic ointment. Hand contractures, another complication associated with HI, may require a surgical consult, as gangrene of the distal digits can occur if contractures go untreated. In addition, physiotherapy is an important aspect of early and long-term care, as it decreases contractures and promotes increased range of motion of joints. Although antibiotic and/ or antifungal prophylaxis may seem intuitive in patients with severely compromised skin barriers like those of HI, there exists little clinical evidence for such prophylaxis. Systemic retinoids have become a mainstay of therapy in HI [7]. Early use of systemic retinoids promotes accelerated shedding of the hyperkeratotic plates, whereas continued use reduces scale and improves ectropion and eclabium. Retinoids should be started as soon after delivery as possible. Acitretin (dose of 1 mg/ kg/ day) has become the preferred retinoid because its shorter half-life and provides a better safety profile [7]. Moreover, acitretin

when compared with etretinate has been associated with reduced severity of side effects, including less severe headaches, mucocutaneous dryness and skin irritation. Breast-feeding should also be encouraged. Lastly, it is important that a social worker be involved early to help structure a comprehensive discharge plan that will provide the caretakers with support during the transition from hospital to home. Treatment is continued for several years and it may be required indefinitely to prevent relapse. The dilemma of providing intensive nursing care to these patients while accepting the outcome of severe life-long ichthyosis poses a difficult situation to both caretakers and families [8]. Genetic counselling and the availability of prenatal diagnosis using fetal skin biopsy in select centres must be made known to parents.

Conflicts of Interest

None identified

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