

Case Report

Harlequin fetus: a case report

Tahir Javed, Muhammad Faheem Afzal, Humayun Iqbal Khan

Department of Pediatrics, King Edward Medical University, Lahore, Pakistan.

Abstract Harlequin fetus is the most severe form of congenital ichthyosis with the incidence of one in 300,000 births. An autosomal recessive pattern of inheritance is seen mostly. This disorder has ominous prognosis invariably. We report here a case of harlequin fetus born to consanguineous parents. He had typical skin manifestations. Supportive treatment was offered but he died on 5th day of life.

Key words

Harlequin fetus, ichthyosis congenita, eclabium, ectropion.

Introduction

Harlequin fetus is a rare autosomal recessive keratinizing disorder.¹ The earliest record of its description is from Oliver Hart in 1750.² The disorder has an ominous prognosis and affected babies usually die in first days to weeks of life.¹

At birth, it is characterized by armour-like hyperkeratotic plates covering the entire body, ectropion, eclabium, poorly developed ears and contractures of hands and feet. Nails and hair may be absent and joint mobility is restricted.³ Respiration may be compromised because of thick shell of hyperkeratotic layer.⁴

Case report

An hour-old male baby was referred from a public hospital. He was born full term to para two mother by lower segment caesarian section following a breech presentation. He was a product of consanguineous marriage.

Address for correspondence

Dr. Tahir Javed, Assistant Professor,
Department of Pediatrics,
King Edward Medical University, Lahore,
Pakistan.
E mail: drtahirjaved@hotmail.com

The couple had lost one offspring in neonatal period with the same disorder.

Physical examination revealed an infant weighing 3000 grams. The baby's temperature was 98.6 F⁰, pulse rate was 128 per minute and respiratory rate was 40 per minute. The skin was hard, thickened, waxy and yellowish in color. It was split irregularly to reveal erythematous moist fissures (**Figure 1**). The ears were crumpled and hypoplastic. There was severe ectropion and eclabium. The baby's cry was normal but he was unable to suck effectively due to persistent opening of mouth. The nose was flattened. Hair was scanty. There was small penis, undescended testes and a rudimentary scrotum. The limbs were edematous with small hands and feet having circumferential constriction bands around. The nails were hypoplastic. Rest of the physical examination was unremarkable. Laboratory findings were within normal range.

Immediately after transfer to our neonatal intensive care unit, the baby was nursed in a humidified incubator. Umbilical catheterization was set up to establish venous access. Appropriate fluids and



Figure 1 Thick armour-like scales with fissuring, areas of erythema, ectropion and eclabium.

antibiotics were administered. Liquid paraffin was applied on the skin locally. Ectropion was covered with eye pads and antibiotic ointment was applied.

Initial progress was slow, plate like scales split and peeled off revealing glazed and erythematous skin underneath. On 3rd day of admission, baby tolerated nasogastric feeding and temperature was maintained in incubator. He was passing urine and stool normally. On 5th day of life, baby expired of respiratory failure. A post mortem examination could not be conducted due to social reasons.

Discussion

Harlequin fetus is a rare disorder with the incidence of 1: 300,000 births. The first report is from the diary of Oliver Hart, of Charleston, South Carolina who described these features in 1750.² We have admitted 4 cases in past 2 months in our neonatal intensive care unit (personal observation). More than 100 cases have been reported. Neither racial or gender predilection is known.⁴

This disorder has been reported from different ethnic groups. Mutations in ABCA12 gene underlie the severe

congenital ichthyosis. ABCA12 gene may play a critical role in the formation of lamellar granules and the discharge of lipids into the intercellular spaces and its mutation causes different lipid transport that significantly impacted normal development of the skin barrier. This finding paves the way for early prenatal diagnosis.^{5,6,7} We could not map this abnormality because of non availability of genetic diagnostic facilities.

Consanguinity and family history of the same and other skin disorders are hallmark of the diagnosis. Harlequin babies with family history of psoriasis, juvenile rheumatoid arthritis and hypothyroidism have been reported.³ There have been reports of several families with siblings affected with harlequin ichthyosis.⁸ Twins affected by harlequin ichthyosis have also been reported.² Occurrence of consanguinity in same parents and of harlequin ichthyosis in siblings suggest an autosomal recessive mode of inheritance.⁹

Clinically, harlequin fetus is characterized by severely thickened skin with large, shiny plates of hyperkeratotic scale, severe ectropion, small and rudimentary pinnae, eclabium and nasal hypoplasia. Flexion contractures of limbs with circumferential constriction bands, hypoplasia of the fingers, toe- and fingernails have been reported. Temperature dysregulation, dehydration, respiratory compromise and central nervous system depression are the known complications of this disorder.⁴

Oral vitamin A, topical antiseptics, vaseline, 5% lactic acid and liquid paraffin have been found effective in management of harlequin ichthyosis.¹ Etretinate and acitretin are synthetic retinoids derived from vitamin A.

Although, the exact mode of their action is unknown but retinoids have been shown to control differentiation and proliferation of keratinizing and non-keratinizing epithelia. Isoretinoin, another retinoid, in a dose of 0.5mg/kg/day may be used.^{2,4} ABCA12 gene transfer into patient keratinocytes also lends hope to the possibility of a specific treatment for this devastating disorder.⁵

Somatic diagnosis is based upon clinical features, skin biopsy and ABCA12 gene mapping. Manifestations of harlequin fetus are usually in third trimester but fetal foot length shorter than femur length may be an important and probably the first marker seen in the second trimester for the ultrasonographical prenatal diagnosis of harlequin fetus.¹⁰ Fetal skin biopsy can be performed prenatally. Mother of our patient did not have her prenatal ultrasound of abdomen.

This disorder has an ominous prognosis invariably. Affected children are at greater risk of fluid and electrolyte imbalance, serious infections and temperature dysregulation during neonatal period and often die with complications shortly after birth. However, survival period of up to 2.5 years has been reported in a child who was treated with eritinate.²

The parents of all the diagnosed patients must receive genetic counseling concerning the potential risk of affected offspring and prenatal diagnosis. Parents should be

educated about the potential complications of the disease, as well.

References

1. Darmstadt GL, Sidbury R. The skin. In: Behrman RE, Kliegman RM, Jenson HB, editors. *Nelson Textbook of Pediatrics*, 17th edn. Philadelphia: WB Saunders; 2004. p. 2153-2250.
2. Dolunay G, Ilknur K, Merve B. A case of harlequin fetus with psoriasis in his family. *J Pediatr and Neonatol* 2001; **2**: 1-7.
3. Chan YC, Tay YK, Tan LK et al. Harlequin ichthyosis in association with hypothyroidism and juvenile rheumatoid arthritis. *Pediatr Dermatol* 2003; **20**: 421-6.
4. Sheila AU, Julitte S, Abby Van et al. Ichthyosis fetalis [online] 2005[cited 2005 Sep 27]. Available from: URL: <http://www.emedicine.com/derm/topic192.htm>.
5. Hovnanian A. Harliquen ichthyosis unmasked: a defect in lipid transport. *J Clin Invest* 2005; **115**: 1708-10.
6. Kelsell DP, Norgett EE, Unsworth H et al. Mutations in ABCA12 underlie the severe skin disease harlequin ichthyosis. *Am J Hum Genet* 2005; **76**: 794-803.
7. Akiyama M, Sugiyama-Nakagiri Y, Sakai K et al. Mutations in lipid transporter ABCA12 in harlequin ichthyosis and functional recovery by corrective gene transfer. *J Clin Invest* 2005; **115**: 1777-84.
8. Multani AS, Sheth FJ, Shah VC, Chinoy NJ, Pathak S. Three siblings with harlequin ichthyosis in an Indian family. *Early Human Dev* 1996; **19**: 229-33.
9. Malik NA, Ghauri AQ. Harlequin fetus. *J Coll Physicians Surg Pak* 2004; **14**: 294-5.
10. Suresh S, Vijayalakshmi R, Indrni S, Lata M. Short foot length: a diagnostic pointer for harlequin ichthyosis. *J Ultrasound Med* 2004; **23**: 1653-7.

