

Hypomelanosis of Ito

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Hypomelanosis of Ito is a neuro-cutaneous syndrome characterized by hypopigmented lesions that have a peculiar pattern of whorls, swirls, streaks and patches(1). The distribution of hypopigmented lesions resembles the hyperpigmented lesions of incontinentia pigmenti. For this reason, Ito used the term incontinentia pigmenti acromians when he described this condition for the first time in the year 1952(2). However, the two conditions are quite distinct.

The clinical picture (*Fig. 1*) of hypomelanosis of Ito (HI) varies widely being associated with many anomalies, particularly of central nervous system, eye and skeleton(1,3). The cutaneous hypopigmentation is the only constant feature and is best seen in dark skinned individuals. It is one of the least understood amongst the neurocutaneous syndromes(4). We report a case of hypomelanosis of Ito.

Case Report

A 2-year-old girl was brought for evaluation of developmental delay and hypopigmented skin lesions. She was born to a non-consanguineous parent after full term normal delivery. She attained head control at 8 months, sat at 1 ½ years and smiled at 1 year 10 months. Antenatal, postnatal and family history was non contributory.

She never had convulsions. Head circumference, was 47.5 cm (25th percentile on NCHS chart), height 85 cm (near 25th percentile), and weight 10 kg (<10th percentile). She had coarse facial features, low hair line, prominent forehead with loss of frontal hair, thick eyelashes and eyebrows, hirsuit philtrum and thick lips. Ophthalmic examination revealed bilateral cataract and abnormal pigmentation of retina. The neck was short. There was laxity of joints and genu recurvatum. Muscle tone and deep tendon reflexes were normal.

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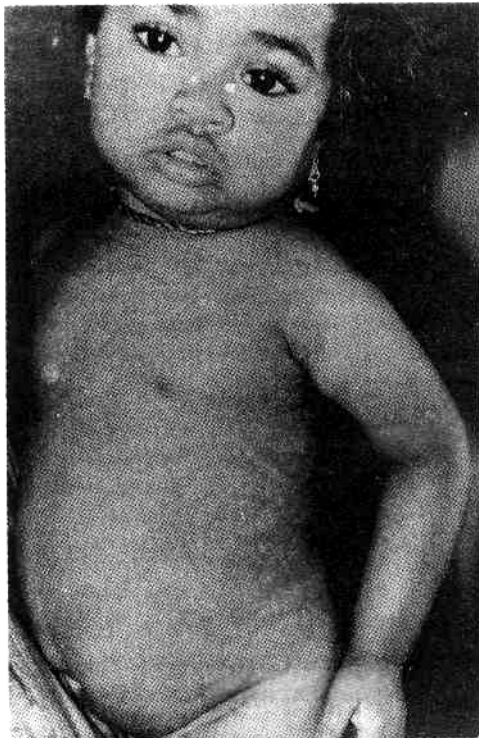


Fig. 1. Photograph of patient showing swirls and whorls of hypopigmentation.

Discussion

The first report by Ito seemed to have no significance except for hypopigmentation(2). It became evident later that 76-94% of cases of HI had one or more non cutaneous anomalies(4) which include those of the CNS, eye, musculoskeletal system and teeth. There is no consistent pattern of associated anomalies. This patient had marked delay in development and ocular anomalies with some minor malformations.

Of the CNS problems, mental retardation (>60%) and seizures are frequent. Seizures manifest in early infancy and tend to be refractory(4). CT scan appearances have included cerebral atrophy, porencephalic dilatation and low density of the entire white matter(1). MRI examination may be superior for parenchymal differentiation(4).

Ocular anomalies include heterochromia irides, strabismus, myopia, opaque cornea, optic atrophy and microphthalmia(3). Other associated anomalies include macrocephaly, microcephaly, hemihypertrophy, kyphoscoliosis, coarse facies, genital anomalies, inguinal hernia, congenital heart disease, hyper-telorism, cleft palate and abnormalities of teeth and feet(1,3).

The hypopigmented skin lesions of HI have a unique distribution and appearance. They result from decrease in the number of melanocytes as well as of the number and size of melanosomes(3). The bizarre pattern of stripes, streaks, whorls and patches has been explained on the basis of mosaicism(3,6). Two clones of cells are randomly distributed in the primary streak in early embryogenesis (5). They migrate dorsoventrally, proliferate and produce two populations of melanocytes with different pigment producing potential. The paths of this migration are known as Blaschko lines. These lines do not correspond to cleavage planes, *i.e.*, Langer lines, nor to dermatomes. Lyonization of primordial clones of melanocytes is one argument advanced to explain the mosaicism(1,6). The female predominance seen among HI patients points towards an X inactivation to become functional mosaics(1).

Other possible explanation for the presence of two genetically distinct cell lines include gametic half chromatid mutations, chimerism, or somatic mutations in early embryogenesis(6). Various types of autosomal mosaicism have also been reported in many cases of HI. Some authors even consider HI as a clinical marker for non-specific chromosome mosaicism(5).

Although an autosomal dominant inheritance of HI has been suggested, majority of cases are sporadic (4). Mosaicism may be responsible for other defects. Two genetically different cell lines

may interfere with migration of neural crest cells, leading to failure of migration of melanoblasts and differentiation into melanocytes. Abnormalities of teeth occur, as odontoblasts are also derived from the neural crest. CNS anomalies-and eye changes may result from a generalized disturbance affecting melanin production by both neural crest and optic vesicle derivatives (5).

Six cases of HI are reported showing an X-autosome translocation involving Xp11 indicating that this event may not be coincidental(7). Further chromosomal studies are indicated in these patients, using cultured peripheral blood and/or fibroblasts to clarify the pathogenesis of the condition.

REFERENCES

1. Glover MT, Brett EM, Atherton DJ. Hypomelanosis of Ito: Spectrum of the disease. *J Pediatr* 1989,115: 75-80.
2. Ito M. Studies of Melanin. XI. Incontinentia pigmenti achromians: A singular case of naevus depigmentosus systematics bilateralis. *Tohoku J Exp Med* 1952, 55 (Suppl): 57-59.
3. Takematsu H, Sato, Igarashi M, Seiji M. Incontinentia pigmenti achromians (Ito). *Arch Dermatol* 1983,119: L 391-395.
4. Anonymous. Hypomelanosis of Ito. *Lancet* 1992, 339: 651-652.
5. Ritter CL, Steele MW, Wenger SL, Cohen BA: Chromosome mosaicism in Hypomelanosis of Ito. *Am J Med Genet* 1990, 35: 14-17.
6. Flannery BD. Pigmentary dysplasias, hypomelanosis of Ito and genetic mosaicism. *Am J Med Genet* 1990, 35: 18-21.
7. Lungarotti MS, Martello C, Calabro A, Baldari F, Mariotti G. Hypomelanosis of Ito associated with chromosomal translocation involving Xp11. *Am J Med Genet* 1991, 40: 447-448.

