GENETICS AND GENODERMATOSES

A CHINESE CASE OF CONGENITAL ICHTHYOSIFORM ERYTHRODERMA WITH ABCA12 MUTATIONS

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Background: Although ABCA12 mutations are causes of congenital ichthyosiform erythroderma (CIE) reported in the Europe, Africa, Pakistan, Arab, Israelis, especially frequently found in Japan, ABCA12 mutations occurred in China was rarely reported. We present a Chinese girl of CIE with ABCA12 mutations.

Observation: A girl of 1 year and 3 months old was characterized by whitish scales on an erythematous background with slight ectropion. Her hair, eyebrows, eyelashes were clearly sparse. She was born as a collodion baby with no family history. She was diagnosed with CIE. Next generation sequencing revealed compound heterozygous ABCA12 mutations including a known missense mutation c.4139A>G (p.Asn1380Ser) and a novel missense mutation c.4300A>G (p.Thr1434Ala), which had not been described before and predicted likely to affect protein function by bio-analysis tools.
ABCA12 belongs to a subfamily of the ATP-binding cassette (ABC) transporters that carry out energy-dependent transport of substrate molecules. ABCA12 contains 2 transmembrane(TM) domains and two ATP-binding cassettes in the cytoplasm. More than 93% of harlequin ichthyosis had mutations in ABCA12, which shows the most severe phenotype with most truncation or deletion mutations. The less severe congenital ichthyosis (CIE or lamellar ichthyosis LI) have at least one non-truncating mutation. Lefevre reported the mutations (homozygous p. Asn1380Ser, p. Gly1381Glu, p. Arg1514His, p. Glu1539Lys, p. Gly1651Ser, compound heterozygous p. Asn1380Ser and p. Gly1651Ser) underlying LI phenotype clustered in region of first ATP-binding cassette in Africa. In Japan, ABCA12 missense mutations (p. Gly1136Asn, p.Phe2144Ser, p.Asn2184Ile and p.Trp1235Ser) in TM domains were reported underling CIE, in which p.Asn1380Ser and p.Phe2144Ser were compound heterozygous mutations.

Key message: Our finding indicates ABCA12 missense mutations, despite located in functional domain (1st ATP-binding cassette), may produce a partial loss of function leading to a mild ichthyosis phenotype(CIE). We expand the phenotypic and genotypic spectrum of ABCA12 mutations.