Autosomal Recessive Tetra-Amelia

Alternative Names
Tetra-Amelia, Autosomal Recessive
Autosomal Recessive Tetraamelia

WHO International Classification of Diseases
Congenital malformations, deformations and chromosomal abnormalities

OMIM Number
273395

Mode of Inheritance
Autosomal recessive

Gene Map Locus
17q21

Description
Tetra-amelia is a very rare disorder that is characterized by congenital absence of all four limbs. Associated abnormalities usually include: craniofacial, urogenital, and pulmonary defects. The lungs may be small or totally absent. Almost, tetra-amelia is caused by teratogens, however, it can be also inherited.

Molecular Genetics
It is thought that mutation in the wingless-type MMTV integration site family member 3 (WNT3) gene is responsible for causing tetra-amelia in humans. Moreover, studies showed that WNT3 gene not only plays an important role in early limb development, but also participates in the development of other organs. This possibly explains the association of tetra-amelia with other abnormalities. These findings suggest that mutations in WNT3 gene might be loss-of-function mutations.

Epidemiology in the Arab World

Lebanon
Megarbane et al. (1997) explored a male with amelia of the lower limbs and peromelia of the upper limbs and a syrinx. The parents were healthy non-consanguineous Christians who had another normal boy. At age of nine months, the patient had capillary hemangiomomas of the philtrum, the nose, between the eyes, and on the medial portion of the supra-orbital ridges. Oral frenula on the upper lip, high arched palate, and micrognathia were also noticed. The upper limbs consisted of very short stumps containing a single bone. The right leg was totally absent and a small skin tag was present on the left side. The external genitalia were normal with bilateral undescended testes. Radiological examination of the spine and pelvis revealed hypoplasia of the acetabula. MRI examination of the head and the spine showed plagioccephalic skull, enlarged ventricles and subarachnoid spaces, and a syringomyelia extending from the C5-C6 intervertebral disc level to the conus medullaris. Also, there was a bilobulated cystic dilatation of the syrinx in association with a major regular thinning of the cord. Chromosome studies were normal (46, XY).

Palestine
Rosenak et al. (1991) described a term amelic female infant who was born to an apparently non-consanguineous Arab Moslem couple. This was followed by the birth of 4 normal children. Afterwards, in 2 subsequent pregnancies, 2 amelic fetuses were diagnosed by transabdominal ultrasonography in the 18th and 12th week of gestation. Pregnancies were terminated and on autopsy both amelic fetuses had severe lung hypoplasia and aplasia of the peripheral pulmonary vessels. The first fetus also had apparently low-set ears and micrognathia, whereas the last had hydrocephaly and left cleft lip beside the lung hypoplasia and aberrant pulmonary artery.

Zlotogora et al. (1993) reported two additional families. In both instances, the parents of the affected children were Muslim Palestinian Arabs. No relationship was known between the
two families and they originated from different areas; however, they had the same family name. The two families were not related to either of the parents of the patients reported by Rosenak et al. (1991), who originated from the same region as one of the families of Zlotogora et al. (1993). All the patients died soon after birth and were thought to have pulmonary hypoplasia. Cleft lip or hydrocephalus was found in some of the patients.

References


Contributors
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