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My46 Trait Profile

Campomelic dysplasia

Campomelic dysplasia is a rare and severe disorder of the bones and reproductive system. It is caused by mutations in the SOX9 gene that makes a protein involved in the development of bone and cartilage.

Characteristics of Campomelic dysplasia

Skeletal dysplasias are a group of bone and cartilage conditions. Campomelic dysplasia is a type of skeletal dysplasia that is characterized by distinct facial features, skeletal abnormalities, and abnormal development of the genitalia or reproductive organs. . Campomelic dysplasia is a severe condition that is often fatal in the newborn period. However, some individuals with campomelic dysplasia can survive into adulthood. The characteristic facial features seen in this condition include a relatively large head, prominent forehead, flat face, and small chin. The skeletal abnormalities include short bowed or curved legs (i.e., bowing of the tibia and femur – the two long bones in the legs), narrow and bell-shaped chest, curvature of the spine (scoliosis) and eleven pairs of ribs instead of twelve. Sometimes other bones, including those in the arms, can be bowed as well. Often, individuals with campomelic dysplasia have difficulty breathing due to instability of the airway (i.e., underdeveloped voice box and wind pipe leading to airway obstruction). Sometimes, affected individuals who are genetically male (i.e., those with one X chromosome and one Y chromosome) have ambiguous (not clearly male or female) or female external genitalia.

Diagnosis/Testing

Most individuals with campomelic dysplasia have a change or mutation in the SOX9 gene. This gene makes a protein that plays an important role in the development of the skeleton and reproductive system. Mutations in this gene do not allow the protein to work properly, thus leading to the signs typically seen in campomelic dysplasia.

Management/Surveillance

Because of the difficulty breathing (respiratory insufficiency), campomelic dysplasia is most often lethal in the newborn period. However, some individuals survive until adulthood. In such cases, management often includes care from a geneticist, genetic counselor, orthopedist (a doctor who specializes in bone and joint care), endocrinology, surgery, and other specialists. Individuals with campomelic dysplasia should have their growth and spine monitored by a doctor yearly. Management may also include corrective surgeries for features such as cleft palate, bowed bones, and congenital hip dislocations. Sometimes bracing and casting are required after surgery. Additionally, a gonadectomy (removal of underdeveloped reproductive organ tissue) is recommended in genetically male individuals with campomelic dysplasia who have female external genitalia due to the risk of developing gonadoblastoma, a type of tumor.

Mode of inheritance

Campomelic dysplasia is inherited in an autosomal dominant pattern. This means inheriting one SOX9 mutation is enough for an individual to be affected and show signs of campomelic dysplasia. While the mutation can be inherited from an affected parent, to date, most mutations occur brand new (de novo) in an affected child.

Risk to family members

The risk to family members depends on whether or not the individual with campomelic dysplasia has a parent

affected with campomelic dysplasia. This is unlikely due to the typical lethal nature of the condition, however, if a parent also has campomelic dysplasia, the risk of having a child with campomelic dysplasia is 50% with each pregnancy. However, most cases occur de novo in an affected individual. Thus, if a parent does not have campomelic dysplasia, the risk of other siblings being affected is very low.

Special considerations

None

Resources

Genetics Home Reference: Campomelic Dysplasia
http://ghr.nlm.nih.gov/condition/campomelic-dysplasia
Little People of America
http://www.lpaonline.org/
Nemours Children's Health System
http://www.nemours.org/service/medical/skeletaldysplasia/campomelic.html?tab=about

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