Anauxetic dysplasia

Description

Anauxetic dysplasia is a disorder characterized by extremely short stature (dwarfism) and other skeletal abnormalities, an unusually large range of joint movement (hypermobility), dental problems, and distinctive facial features. Mild intellectual disability can also occur in this disorder.

People with anauxetic dysplasia have dwarfism with unusually short limbs for their height (disproportionate short stature) beginning before birth. Dislocation of the bones at the top of the spine (atlantoaxial subluxation) can also occur in this disorder, and may cause pinching (compression) of the spinal cord. As a result, affected individuals may experience neurological symptoms including pain, tingling, numbness, coordination problems, weakness, and paralysis. In severe cases, the spinal cord compression may lead to paralysis of the muscles needed for breathing, which can be life-threatening during early childhood.

Other skeletal abnormalities in anauxetic dysplasia include a barrel-shaped chest and a rounded upper back that also curves to the side (kyphoscoliosis). Without surgical correction, the kyphoscoliosis can constrict the lungs and cause difficulty breathing. People with anauxetic dysplasia can also have an exaggerated curvature of the lower back (hyperlordosis), dislocation of the hips, and soles of the feet that are rounded outward (rocker-bottom feet).

Typical facial features in anauxetic dysplasia include closely spaced eyes (hypotelorism) , a flat or sunken appearance of the middle of the face (midface hypoplasia), an unusually large tongue (macroglossia), and a protruding chin (prognathism). Affected individuals can also have fewer teeth than normal (hypodontia).

Frequency

Anauxetic dysplasia is a very rare disorder; its prevalence is unknown.

Causes

Anauxetic dysplasia can be caused by mutations in the *RMRP* gene. Unlike many genes, the *RMRP* gene does not contain instructions for making a protein. Instead, a molecule called a noncoding RNA, a chemical cousin of DNA, is produced from the *RMRP* gene. Several proteins attach (bind) to this RNA molecule, forming an enzyme

complex called mitochondrial RNA-processing endoribonuclease, or RNase MRP.

The RNase MRP enzyme is thought to be involved in several important functions in the cell, including processing ribosomal RNA. This form of RNA is associated with cell structures called ribosomes, which assemble protein building blocks (amino acids) into proteins.

The *RMRP* gene mutations that cause anauxetic dysplasia alter the noncoding RNA produced from the gene, and the RNase MRP enzyme containing the altered noncoding RNA is impaired in its ribosomal RNA processing function. Although the specific mechanism is unknown, impairment of this function likely disrupts skeletal development, leading to the signs and symptoms of anauxetic dysplasia.

Mutations in at least one gene that provides instructions for making a protein component of the RNase MRP enzyme complex can also cause anauxetic dysplasia.

Learn more about the gene associated with Anauxetic dysplasia

- RMRP

Additional Information from NCBI Gene:

- POP1

Inheritance

This condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- AD
- Spondylometaepiphyseal dysplasia, anauxetic type
- Spondylometaepiphyseal dysplasia, Menger type

Additional Information & Resources

Genetic and Rare Diseases Information Center

- Anauxetic dysplasia (https://rarediseases.info.nih.gov/diseases/9657/index)

Patient Support and Advocacy Resources

- National Organization for Rare Disorders (NORD) (https://rarediseases.org/)

Catalog of Genes and Diseases from OMIM

- ANAUXETIC DYSPLASIA 1; ANXD1 (https://omim.org/entry/607095)
- ANAUXETIC DYSPLASIA 2; ANXD2 (https://omim.org/entry/617396)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28anauxetic+dysplasia%5BALL%5D%29)

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