Weissenbacher-Zweymüller Syndrome

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Infants born with Weissenbacher-Zweymüller syndrome are smaller than average because the bones in their arms and legs are unusually short. The thigh and upper arm bones are wider than usual at the ends (described as dumbbell-shaped), and the bones of the spine (vertebrae) may also be abnormally shaped. High-frequency hearing loss occurs in some cases. Distinctive facial features include wide-set protruding eyes, a small and upturned nose with a flat bridge, and a small lower jaw. Some affected infants are born with an opening in the roof of the mouth (a cleft palate).

Most people with Weissenbacher-Zweymüller syndrome experience significant "catch-up" growth in the bones of the arms and legs during childhood. As a result, adults with this condition are not unusually short. However, affected adults still have other signs and symptoms of Weissenbacher-Zweymüller syndrome, including distinctive facial features and hearing loss.

Keywords: genetic conditions

1. Introduction

Infants born with Weissenbacher-Zweymüller syndrome are smaller than average because the bones in their arms and legs are unusually short. The thigh and upper arm bones are wider than usual at the ends (described as dumbbell-shaped), and the bones of the spine (vertebrae) may also be abnormally shaped. High-frequency hearing loss occurs in some cases. Distinctive facial features include wide-set protruding eyes, a small and upturned nose with a flat bridge, and a small lower jaw. Some affected infants are born with an opening in the roof of the mouth (a cleft palate).

Most people with Weissenbacher-Zweymüller syndrome experience significant "catch-up" growth in the bones of the arms and legs during childhood. As a result, adults with this condition are not unusually short. However, affected adults still have other signs and symptoms of Weissenbacher-Zweymüller syndrome, including distinctive facial features and hearing loss.

2. Frequency

Weissenbacher-Zweymüller syndrome is very rare; only a few affected families worldwide have been described in the medical literature.

3. Causes

Weissenbacher-Zweymüller syndrome is caused by mutations in the *COL11A2* gene. This gene provides instructions for making one component of type XI collagen, which is a complex molecule that gives structure and strength to the connective tissues that support the body's joints and organs. Type XI collagen is found in cartilage, a tough but flexible tissue that makes up much of the skeleton during early development. Most cartilage is later converted to bone, except for the cartilage that continues to cover and protect the ends of bones and is present in the nose and external ears. Type XI collagen is also part of the inner ear and the nucleus pulposus, which is the center portion of the discs between vertebrae.

At least one mutation in the *COL11A2* gene can cause Weissenbacher-Zweymüller syndrome. This mutation disrupts the assembly of type XI collagen molecules. The defective collagen weakens connective tissues in many parts of the body, including the long bones, spine, and inner ears, which impairs bone development and underlies the other signs and symptoms of this condition. It is not well understood why "catch-up" bone growth occurs in childhood.

3.1 The gene associated with Weissenbacher-Zweymüller syndrome

- COL11A2

4. Inheritance

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

Most cases of this condition result from a new (de novo) mutation in the gene that occurs during the formation of reproductive cells (eggs or sperm) or in early embryonic development. These cases occur in people with no history of the disorder in their family.

5. Other Names for This Condition

- heterozygous OSMED
- heterozygous otospondylomegaepiphyseal dysplasia
- otospondylomegaepiphyseal dysplasia, autosomal dominant
- Pierre Robin syndrome with fetal chondrodysplasia
- WZS

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