Cohen Syndrome

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Cohen syndrome is an inherited disorder that affects many parts of the body and is characterized by developmental delay, intellectual disability, small head size (microcephaly), and weak muscle tone (hypotonia). Other features common in this condition include worsening nearsightedness (myopia), breakdown (degeneration) of the light-sensitive tissue at the back of the eye (retinal dystrophy), an unusually large range of joint movement (hypermobility), and distinctive facial features. These facial features typically include thick hair and eyebrows, long eyelashes, unusually-shaped eyes (down-slanting and wave-shaped), a bulbous nasal tip, a smooth or shortened area between the nose and the upper lip (philtrum), and prominent upper central teeth. The combination of the last two facial features results in an open mouth.

Keywords: genetic conditions

1. Introduction

The features of Cohen syndrome vary widely among affected individuals. Additional signs and symptoms in some individuals with this disorder include low levels of white blood cells (neutropenia), overly friendly behavior, and obesity that develops in late childhood or adolescence. When obesity is present, it typically occurs around the torso, with the arms and legs remaining slender (called truncal obesity). Individuals with Cohen syndrome may also have narrow hands and feet, and slender fingers.

2. Frequency

The exact incidence of Cohen syndrome is unknown. It has been diagnosed in fewer than 1,000 people worldwide. More cases are likely undiagnosed.

3. Causes

Mutations in the *VPS13B* gene (also called the *COH1* gene) cause Cohen syndrome. The protein produced from this gene is a part of the Golgi apparatus, which is a cell structure in which newly produced proteins are modified so they can carry out their functions. In particular, the VPS13B protein is involved in a modification called glycosylation, which is the attachment of sugar molecules to proteins. The VPS13B protein also appears to be involved in the sorting and transporting of proteins inside the cell. This protein is thought to be involved in normal growth and development of nerve cells (neurons) and fat cells (adipocytes), and may play a role in the storage and distribution of fats in the body.

Most mutations in the *VPS13B* gene are believed to prevent the production of functional VPS13B protein. Studies suggest that a loss of this protein disrupts the organization of the Golgi apparatus and impairs normal glycosylation. However, it is not known how a lack of functional VPS13B protein or these cellular changes lead to the signs and symptoms of Cohen syndrome. Researchers speculate that problems with neuron development underlie microcephaly, intellectual disability, and retinal dystrophy and that abnormal fat storage may cause truncal obesity in people with Cohen syndrome.

3.1. The Gene Associated with Cohen Syndrome

- VPS13B

4. 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.

5. Other Names for This Condition

- hypotonia, obesity, and prominent incisors
- Norio syndrome
- obesity-hypotonia syndrome
- Pepper syndrome
- prominent incisors-obesity-hypotonia syndrome

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