Clouston Syndrome

Subjects: Genetics & Heredity
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Clouston syndrome is a form of ectodermal dysplasia, a group of about 150 conditions characterized by abnormal development of some or all of the ectodermal structures, which include the skin, hair, nails, teeth, and sweat glands. Specifically, Clouston syndrome is characterized by abnormalities of the hair, nails, and skin, with the teeth and sweat glands being unaffected.

Keywords: genetic conditions

1. Introduction

In infants with Clouston syndrome, scalp hair is sparse, patchy, and lighter in color than the hair of other family members; it is also fragile and easily broken. By puberty, the hair problems may worsen until all the hair on the scalp is lost (total alopecia). The eyelashes, eyebrows, underarm (axillary) hair, and pubic hair are also sparse or absent.

Abnormal growth of fingernails and toenails (nail dystrophy) is also characteristic of Clouston syndrome. The nails may appear white in the first years of life. They grow slowly and gradually become thick and misshapen. In some people with Clouston syndrome, nail dystrophy is the most noticeable feature of the disorder.

Many people with Clouston syndrome have thick skin on the palms of the hands and soles of the feet (palmoplantar hyperkeratosis); areas of the skin, especially over the joints, that are darker in color than the surrounding skin (hyperpigmentation); and widened and rounded tips of the fingers (clubbing).

2. Frequency

The prevalence of Clouston syndrome is unknown. Cases have been reported in many populations; the disorder is especially common among people of French-Canadian descent.

3. Causes

Clouston syndrome is caused by mutations in the *GJB6* gene. This gene provides instructions for making a protein called gap junction beta 6, more commonly known as connexin 30. Connexin 30 is a member of the connexin protein family. Connexin proteins form channels called gap junctions, which permit the transport of nutrients, charged atoms (ions), and signaling molecules between neighboring cells. The size of the gap junction and the types of particles that move through it are determined by the particular connexin proteins that make up the channel. Gap junctions made with connexin 30 transport potassium ions and certain small molecules.

Connexin 30 is found in several different tissues throughout the body, including the skin (especially on the palms of the hands and soles of the feet), hair follicles, and nail beds, and plays a role in the growth and development of these tissues.

GJB6 gene mutations that cause Clouston syndrome change single protein building blocks (amino acids) in the connexin 30 protein. Although the effects of these mutations are not fully understood, they lead to abnormalities in the growth, division, and maturation of cells in the hair follicles, nails, and skin.

3.1. The Gene Associated with Clouston Syndrome

- GJB6

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.

In most cases, an affected person inherits the mutation from one affected parent. Other cases result from new mutations in the gene and occur in people with no history of the disorder in their family.

5. Other Names for This Condition

- Clouston hidrotic ectodermal dysplasia
- Clouston's syndrome
- ECTD2
- ectodermal dysplasia 2, Clouston type
- HED2
- hidrotic ectodermal dysplasia 2

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