Sotos Syndrome

What is Sotos Syndrome?

Sotos syndrome (cerebral gigantism or Sotos-Dodge syndrome) is a rare genetic disorder characterized by excessive physical growth during the first years of life. Excessive growth often starts in infancy and continues into the early teen years. The disorder may be accompanied by autism, mild intellectual disability, delayed motor, cognitive, and social development, hypotonia (low muscle tone), and speech impairments. Children with Sotos syndrome tend to be large at birth and are often taller, heavier, and have relatively large skulls (macrocephaly) than is normal for their age.

What are the signs and symptoms of Sotos Syndrome?

This syndrome is characterized by overgrowth and advanced bone age. Affected individuals are dysmorphic, with macrodolichocephaly, downslanting palpebral fissures and a pointed chin. The facial appearance is most notable in early childhood. Affected infants and children tend to grow quickly; they are significantly taller than their siblings and peers, and have an unusually large skull and large head. Adult height is usually in the normal range, although Broc Brown has the condition and was named the world's tallest teenager. As of late 2016, he was 7'8" and still growing.

Individuals with Sotos syndrome often have intellectual impairment and most also have behavioral problems. Frequent behavioral impairments include attention deficit hyperactivity disorder (ADHD), phobias, obsessive compulsive disorder, tantrums, and impulsive behaviors (impulse control disorder). Problems with speech and language are also common. Affected individuals may often have stuttering, difficulty with sound production, or a monotone voice. Additionally, weak muscle tone (hypotonia) may delay other aspects of early development, particularly motor skills such as sitting and crawling.

Other signs include scoliosis, seizures, heart or kidney defects, hearing loss, and problems with vision. Some infants with this disorder experience jaundice and poor feeding. A small number of patients with Sotos syndrome have developed cancer, most often in childhood, but no single form of cancer has been associated with this condition. It remains uncertain whether Sotos syndrome increases the risk of specific types of cancer. If persons with this disorder have any increased cancer risk, their risk is only slightly greater than that of the general population.

How is Sotos Syndrome Diagnosed?

There is no biochemical marker for the disease. The diagnosis is based on clinical grounds. The most characteristic manifestations are the craniofacial configuration, excessive growth, and developmental delay. Brain abnormalities are present in 60 to 80% of the cases, such as communicating hydrocephalous, and others, but are not diagnostic and are non-specific.

The diagnosis can be confirmed by DNA studies by FISH (fluorescence in situ hybridization) analysis to detect microdeletions or MLPA (multiplex ligation-dependent probe amplification), a simple and reliable method to detect 5q35 microdeletions and partial NSD1 deletions, which account for approximately 10-15% of the cases in western populations. DNA analysis by sequencing would determine NSD1 mutations.

In patients without NSD1 abnormalities, genetic testing for NFIX should be obtained.

Prenatal diagnosis for Sotos syndrome is available by DNA analysis obtained from fetal cells by amniocentesis or chorionic villus sampling, that could be obtained if one of the parents is affected.

What is the prognosis for an individual with Sotos Syndrome?

Sotos syndrome is not a life-threatening disorder and patients may have a normal life expectancy. Developmental delays may improve in the school-age years; however, coordination problems may persist into adulthood, along with any learning disabilities and/or other physical or mental issues.

Resources

https://en.wikipedia.org/wiki/Sotos_syndrome

https://rarediseases.org/rare-diseases/sotos-syndrome/

https://sotossyndrome.org/sotos-syndrome

https://ghr.nlm.nih.gov/condition/sotos-syndrome