Koolen-de Vries Syndrome

What is Koolen-de Vries Syndrome?
Koolen-de Vries Syndrome is a disorder which results in a developmental delay and mild to moderate intellectual disability. They are typically described as cheerful, cooperative and sociable. Usually they have a weak muscle tone in childhood. Around half have recurrent seizures. Individuals with Koolen-de Vries Syndrome have distinctive facial features including a high, broad forehead, droopy eyelids, a narrowing of the eye openings, outer corners of the eyes that point upward, skin folds covering the inner corner of the eyes, a bulbous nose, and prominent ears. Males often have undescended testes. Some individuals have walls between chambers of the heart or other cardiac abnormalities, kidney problems, vision problems and skeletal abnormalities.

It is estimated that 1 in 16,000 have Koolen-de Vries Syndrome. The disorder is commonly underdiagnosed because the underlying genetic cause is not identified in people with intellectual disability.

What causes Koolen-de Vries Syndrome?
Koolen-de Vries Syndrome is caused by a gene called KANSL1 that is eliminated in each cell by genetic changes. Most individuals are missing a small amount of genetic material from one copy of chromosome 17. A small number of people do not have chromosome 17 microdeletion but instead have a mutation within the KANSL1 gene that causes one copy of the gene to be nonfunctional. People with the microdeletion and nonfunctional gene both display the same symptoms.

The KANSL1 gene is responsible for making a protein that helps regulate gene activity by modifying chromatin which is the DNA and protein that packages DNA into chromosomes. Because it is so involved with controlling the activity of other genes, it can affect many parts of the body.

Can Koolen-de Vries Syndrome be inherited?
In most cases the disorder is not inherited. The change in genes occurs at random during the formation of reproductive cells or in early fetal development. People with the disorder typically

have no history of the disorder in their family. It is possible to pass the disorder onto children but no known cases of individuals affected are able to reproduce.

Most people with the disorder caused by deletion of a gene have at least one parent with a common variant of chromosome 17. The gene is found in about 20% of European and Middle Eastern descent and rare in other populations. So while it is common for a parent to have a gene deletion, only an extremely small percentage of parents have a child with Koolen-de Vries Syndrome.

A FISH test, a genetic test can be used to diagnose someone with Koolen-de Vries Syndrome.

Life after diagnosis with Koolen-de Vries Syndrome

After diagnosis, the individual should be tested for other related problems. These ranges of tests will show whether or not they are affected by features of the disorder and at what level. These tests could include developmental evaluation, feeding assessment, speech and language testing, hearing test, kidney ultrasound and heart evaluation. If a child has seizures or has a small head, a brain scan is recommended. A neurologist can run tests as well if seizures are suspected. Some children outgrow seizures and can be easily managed with medication. If the child is short for their age, a test can be done to measure growth hormone shortages. Some preschoolers with the disorder can have problems with repeated infections but it usually eases out by the age of five.

For more information, visit:

- https://ghr.nlm.nih.gov/condition/koolen-de-vries-syndrome
- https://rarediseases.info.nih.gov/gard/10727/koolen-de-vries-syndrome/resources/1
- http://www.chromodisorder.org/
- http://www.rarechromo.org/information/Chromosome%2017/Koolen-De%20Vries%20syndrome%20FTNW.pdf
- http://www.omim.org/entry/610443