What is 2p25.2 deletion syndrome and how is it related to SOX11 syndrome?

A well recognized cause of neurodevelopmental conditions is deletion (loss) of chromosome segments. This can result in the loss of many different adjacent genes (instructions). The SOX11 gene is found at chromosome 2p25.2. Deletions affecting this region of chromosome 2 cause a neurodevelopmental condition with features of SOX11 syndrome. Generally speaking people with 2p25.2 deletions have similar features to people with SOX11 mutations; however, some of the people with this deletion have been more severely affected due to loss of genes which sit next to the SOX11 gene.

What is coffin-siris syndrome (CSS)?

CSS is a rare medical condition in which the affected people have learning problems, with a distinctive physical appearance. A diagnosis of CSS syndrome is based on characteristic facial appearances and other features such as small nails of the little finger and little toes.

Changes in several different genes can cause CSS. Many children with SOX11 mutations have features of CSS. These children could be diagnosed/described as having CSS associated with SOX11 gene variants. Children without features of CSS could be diagnosed as having SOX11 syndrome.

Why did this happen?

There is no known cause for SOX11 variants or 2p25.2 deletions. Nothing you did, or did not do, has caused this.

Can it happen again?

Provided that neither parent carries the same genetic change that their child does the chance of having another affected child is extremely low (<1%). The reason for this residual risk is something called "gonadal mosaicism". This means that people can, very rarely, carry a genetic variant/change in their sperm or eggs but not in the other cells of their body. This would mean that the genetic variant would not be detectable on a blood or saliva sample. Specific advice should be sought from your Clinical Genetics team.

Families say ...

" Ava is currently 2 years and 11 months. She has a very laid back nature, and is extremely sociable. She has a good imagination, and is very playful. Although slightly delayed, her speech is vastly improving, and Ava can now communicate her needs effectively. She is seeing a speech and language therapist who is investigating her continuous dribbling, with the possible cause being muscle control. She is currently attending nursery and her EYFS (early years foundation stage) scores are within the typically developing range. Potty training is still an ongoing challenge, with occasional mistakes of one accident per day. However Ava's ability to entertain through singing and dancing is a constant joy, heightened by her love for dressing up! "

Inform Network Support

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There is a Sox11 gene mutation group on Facebook

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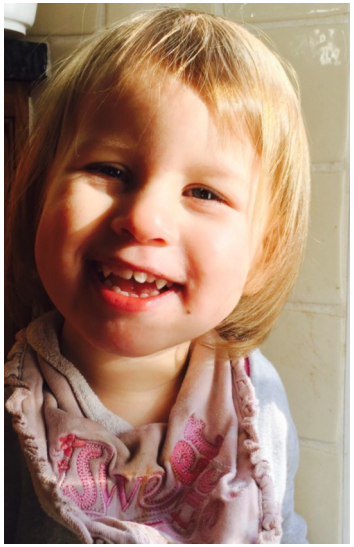
SOX11 syndrome & 2p25.2 deletion syndrome



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What is SOX11 syndrome?

SOX11 syndrome is a recently discovered condition. Clinical Geneticists would refer to it as a neurodevelopmental disorder.

SOX11 syndrome happens when one of a person's two copies of the SOX11 gene does not function as it should.

Genes are the instructions that tell our bodies how to develop and function. Genes are made of DNA and packaged into thread-like structures called chromosomes, which are found in every cell of our body. The SOX11 gene is found on chromosome 2 and is thought to give an important instruction for brain development. This is why alterations in the SOX11 gene are mainly associated with a neurodevelopmental disorder. These alterations can either be spelling mistakes (mutations) in the genetic code of SOX11 (which stop the gene working) or loss of one copy of the SOX11 gene (a deletion).

How many people have SOX11 syndrome?

SOX11 syndrome is a very rare condition. To date only around 20 children with mutations of the SOX11 gene have been reported and 7 people with deletions of the SOX11 gene. However, with increasing use of "next generation" genetic diagnostic technology we will identify more individuals affected by this condition. This will help us provide more useful information to families.

Medical conditions

Seizures/epilepsy

Some children with SOX11 syndrome have experienced seizures, including generalised and absence seizures. These have responded to typical drug treatment for epilepsy.

Skeleton

Some children with SOX11 syndrome have scoliosis (a sideways curvature to the spine). This has generally been mild and not required treatment.

Most children with SOX11 syndrome have curved 5th fingers with small fingernails on their 5th fingers. This does not affect hand functioning.

Most common features

Everyone with SOX11 syndrome has developmental delay and/or learning difficulties. Other typical features include:

- Small head
- Marked speech delay
- Poor feeding as a young baby
- Seizures
- Inward curvature of the 5th [little] finger
- Problems with vision (including squint, small eye size)
- Slow physical growth, below average height and weight
- Autistic behaviours.

None of these features is specific for SOX11 syndrome. Diagnosis must be made with a specific genetic test.

Eyes and vision

Some children with SOX11 syndrome have: short or long sightedness; a squint; one eye which is smaller than it should have been (microphthalmia); oculo-motor apraxia (affected children have difficulty moving their eyes in the desired direction and move their head instead).

In a small number of children with SOX11 syndrome iris coloboma has been reported (notching of the iris of the eye, so called "keyhole" iris)

Feeding difficulties

Many newborn babies with SOX11 had feeding difficulties requiring temporary nasogastric (NG) feeding. No child has required long term NG feeding. Many children require pureed food and have difficulty with lumpy textures and solids.

Brain scans

One child with SOX11 syndrome had a slight reduction in the size of a part of the brain called the cerebellum. Another child with SOX11 syndrome had a slight reduction in the size of the electrical wiring connecting the two halves of the brain (corpus callosum). Changes on brain scans can be caused by SOX11, but we do not have enough information to be certain on the precise types of brain changes that can happen in SOX11 syndrome.

Development

Growth

Children with SOX11 syndrome are generally of average birth weight. Height in childhood lies within the average range. Head circumference is reduced, but not so markedly as to be noticeable to a casual observer.

Sitting, walking, moving

All children had some degree of delayed motor development. Most walked independently at 2-3 years, and all eventually achieved independent walking.

Speech

All but one child had delay in speaking (first words spoken from 18-36 months). At the age of 12 one child had no speech. Receptive language (understanding) is generally reported to be better than expressive (verbal and nonverbal) language.

Learning

All children we know of who are of school age have required some help with learning.

Behaviour

Some children with SOX11 syndrome have been diagnosed as autistic. Children with SOX11 syndrome have no characteristic alterations to their behaviour.

Management recommendations

- Feeding management if necessary (for example NG tube feeding as a baby)
- EEG (measurement of the brain's electrical activity) if seizures are suspected
- Eye check
- Brain imaging with MRI (for example if a child has seizures or limb weakness)
- Follow up by a developmental paediatrician
- Physiotherapy and speech and language therapy as needed.
- Clinical genetics referral (to help interpret genetic test results, advice about future pregnancy etc.)


Age 2