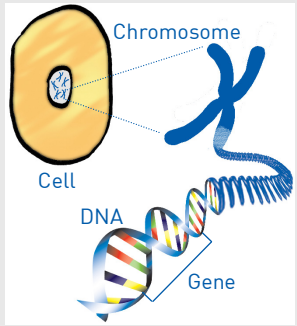
What causes SBBS?



Say-Barber-Biesecker syndrome is caused by alterations in a gene called *KAT6B* on chromosome 10q22.2. The *KAT6B* gene is responsible for producing a type of protein called a histone acetyltransferase. This protein is found in many different parts of the body and is likely to have an effect on development through interacting with a number of other developmental genes. The genetic changes which cause SBBS occur towards the end of the *KAT6B* gene. Individuals who have a gene change nearer to the beginning of the gene have features of a more severe condition called Genitopatellar syndrome (GPS).

Why did this happen?

In almost all cases the gene change which leads to SBBS occurs by chance for the first time in an affected child and is not passed on from a parent. This is termed a 'de novo' change. It is not caused by anything that the parents did before or during the pregnancy and is not due to anything in the environment. SBBS may occur in anyone of any ethnic background and affects boys and girls equally.

Can more than one child be affected by SBBS?

In almost all families only one child will be affected and the chance of another child being affected is low. In very rare circumstances a parent may carry a few eggs or sperm with the *KAT6B* gene change in their testes or ovaries without showing any signs of the condition themselves and without the change being present in their blood on testing. If this is the case, then they are at slightly higher risk of having a second child with the condition. This situation is known as gonadal mosaicism. If a *KAT6B* gene change has been identified in a child then the parents should be offered genetic counselling and testing during any subsequent pregnancies if they wish.

Families say ...

"She is the single greatest gift we have ever been given. She is insanely sweet, amazingly determined, and incredibly resilient. She inspires most of the people in her life and teaches us all what is really important in life. Her smile will brighten any day and it easily makes all the challenges we face seem nearly insignificant."

Families say more ...

"Our four-year-old is brilliant, unique, and incredibly special. When he was born, we didn't know if he would survive. Not only did he survive but he is thriving. He has gone from an oxygen and feeding tube dependent 'NICU graduate' to a fairly independent preschooler. In the past year he has had his feeding tube removed and taken his first solo steps. While he isn't walking on his own yet, he is learning how to use a walker and is an expert at maneuvering his wheelchair. He is non-verbal, but can get his point across and make his opinions well known. He is an amazing big brother and brings our family so much joy."

"As a parent, it's hard to see what the medical community sees as a severe disability since you only see your child and how awesome they are."

Inform Network Support

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Facebook
At www.facebook.com/groups/117748568297590 there is a group for families affected by Ohdo syndrome, including SBBS syndrome

Unique lists other organisations' message boards and websites in order to be helpful to families looking for information and support. This does not imply that we endorse their content or have any responsibility for it.

This guide is not a substitute for personal medical advice. Families should consult a medically qualified clinician in all matters relating to genetic diagnosis, management and health. Information on genetic changes is a very fast-moving field and while the information in this guide is believed to be the best available at the time of publication, some facts may later change. Unique does its best to keep abreast of changing information and to review its published guides as needed.

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Understanding chromosome disorders Unique

Say-Barber-Biesecker Syndrome (SBBS)

rarechromo.org

What is SBBS?

Say-Barber-Biesecker Syndrome (SBBS) is a rare syndrome caused by changes in a gene called *KAT6B*. It is associated with a variable degree of learning disability, characteristic facial features, an increased risk for some physical anomalies at birth, as well as low muscle tone and feeding problems in babies. It is usually recognised because of the typical facial appearance: the baby or child's eye openings may be narrow (blepharophimosis) and the eyelids are droopy (ptosis). Their mouth is usually small and the upper lip thin, and the facial muscles may not move quite so well as normal, so that affected children are often described as having a 'mask-like' appearance.

The history of SBBS is complex since several different names have been attached to the condition in the medical literature in the past. The disorder was described independently by Say and Barber and by Young and Simpson in 1987. A further individual was described by Biesecker in 1991. Some individuals with SBBS have been reported in older medical literature as having Ohdo syndrome, though SBBS is now regarded as the more accurate name.

The main features of SBBS are:

- Some learning disability, usually moderate to severe
- Narrow eye openings and droopy eyelids
- Less facial movement than expected ('mask-like' face)
- Small mouth with thin upper lip
- Small and round ears
- Heart conditions
- Undescended testes (cryptorchidism) in boys
- Relatively long and straight thumbs and first toes
- Underactive thyroid
- Agenesis of the corpus callosum (midline structure of the brain is missing or undeveloped)

Medical concerns

Feeding So far, all young babies with a *KAT6B* change have needed support with feeding. The difficulties are probably related to low muscle tone. Occasionally, a gastrostomy (tube direct to the stomach) has been needed for weight gain. The feeding problems improve over time.

Hypotonia Low muscle tone is universal. It is most noticeable in babies who are very floppy and leads to significant delay in motor milestones, though most children will learn to walk independently. In older children the muscle tone improves but it often causes clumsiness.

Heart Around a half of babies have been born with a healthy heart; around half had a heart problem. The problems are often minor holes in the heart and may not require treatment. Narrowing of the pulmonary valve (regulating blood flow from the heart to the lungs) has been seen in a few babies. More complex heart disease is rare.

Hypothyroidism Around 50% of children have normal thyroid activity; around 50% have an underactive thyroid gland, making this a key feature of SBBS. In some children the thyroid gland may be small or absent. An overactive thyroid gland has also been reported in one child.

Joints A number of joint problems may be seen. Some babies are born with contractures (bent joints), most often just the fingers and toes, but sometimes causing stiffening at the knees or elbows. Talipes (club foot) may be present and the hips may be dislocated at birth. The kneecap (patella) may be small or under-developed and dislocate out of place, showing as prominent dimples over the knees.

Hearing A recent study showed that around 10% of children will need hearing aids or other hearing support. Hearing loss was most often due to nerve deafness. Small ear canals have also been noted.

Eyesight Poor vision may occur due to underdevelopment of the optic nerve that links the eyes with the brain. This may cause nystagmus (to and fro eye movements). The typically narrow eye openings and droopy eyelids do not usually affect vision. Some children have absent or underdeveloped tear ducts which may lead to eye infections.

Cleft palate Cleft palate or bifid uvula (a split in the tissue at the top of the mouth / back of the palate) may occur.

Kidneys genitals and urinary system Children usually have normal kidney function but kidney cysts and hydronephrosis (enlarged kidneys) have been seen. Boys typically have undescended testicles and often an underdeveloped scrotum. Hypospadias (the hole usually at the end of the penis is on the underside) may be seen. Underdeveloped genitalia have been seen in a few girls, too.

Respiratory There have been several reports of breathing difficulties due to narrow or floppy airways in young babies with SBBS. One child had a laryngeal cleft (gap between the larynx (voice box) and the food pipe (oesophagus), so fluid or food can get into the lungs). These symptoms have improved over time.

Growth The majority of babies with *KAT6B* changes will have a normal birth weight. Weight gain may be slow in the first years due to feeding difficulties. Growth may catch up later. Though about half of all children will have a smaller head size than usual, in others the head size will be well within the normal range. A large head is unusual, however.

Development

Early milestones are delayed due to low muscle tone and babies are late to sit independently and may be several years old before they walk. Some may always need support when moving around. Speech is particularly delayed, and though some children will develop useful spoken language, others will use alternatives like signing, gesture and vocal noises to express themselves. Comprehension skills are better than expressive language. Development overall is variable. Among the children diagnosed so far some have a moderate intellectual disability, but in others it is more significant. All children acquire new skills at their own rate over time.

Behaviour

Most parents have not reported specific difficulties with behaviour, although a few children have been anxious when their routine has been interrupted, and some families have reported sensory integration problems.

Medical checks for a child with SBBS

Monitoring weight gain in babies is important. A feeding assessment should be carried out and support offered. A careful check for a cleft palate should be carried out. Thyroid function should be measured, and every child should have a heart scan to check for structural problems and a kidney scan. Congenital dislocation of the hip should be excluded. Hearing should be tested throughout childhood and vision assessed. Children should have a formal examination by an ophthalmologist to check for optic nerve problems. Enquiry should be made about sleep disturbance and a check for sleep apnoea carried out, particularly if children have noisy breathing (stridor). Children should be under the continued care of a general or community paediatrician to monitor their general health and development. Before starting school an assessment of special educational needs should be carried out so that extra help can be put into place.

SBBS syndrome is the right name for this condition. But many families still call it Ohdo syndrome or Say Barber Biesecker Young-Simpson syndrome.