

Loeys-Dietz syndrome

General Facts

What Is Loeys-Dietz syndrome (LDS)?

Loeys-Dietz syndrome (LDS) is a genetic disorder of connective tissue that was identified and named in 2005. At that time doctors realized that even though LDS has some features of other connective tissue disorders, it is a distinct disorder. The other disorders that share features with LDS include Marfan syndrome, Ehlers-Danlos syndrome vascular type, and Shprintzen-Goldberg syndrome.

What Causes Loeys-Dietz syndrome?

LDS is caused by a mutation (change) in one of the genes involved in the *tgf-beta* pathway. When a gene in this pathway has a mutation, the pathway does not function appropriately and the variable features of LDS result. The genes known to cause LDS are *TGFBR1*, *TGFBR2*, *SMAD3* and *TGFB2*.

Who Has Loeys-Dietz syndrome?

Many individuals diagnosed with Loeys-Dietz syndrome are first identified through cardiovascular features in themselves or family members such as aortic aneurysm or dissection. Many other individuals are suspected to have LDS because of skeletal features. The list below outlines some LDS features.

LDS affects both males and females. People can inherit LDS, meaning they get the mutation from a parent who has LDS. Others can have a spontaneous mutation, meaning they are the first in the family to have LDS.

What Are The Features Of Loeys-Dietz syndrome?

Because connective tissue is found throughout the body, LDS features can occur in the heart, blood vessels, bones, joints, skin, and internal organs such as the intestines, spleen, and uterus. Some LDS features are easy to see, while others, such as heart and blood vessel problems, need special tests to find them.

Some LDS features are also found in Marfan syndrome. These include:

- Aortic dilation or aneurysm (enlarged or bulging aorta, the main blood vessel carrying blood from the heart)
- Aortic dissection (tear of the wall of the aorta)
- Mitral Valve Prolapse – MVP (“floppy” mitral valve)
- Pectus excavatum (chest wall deformity that pushes the sternum and breast bone inward) or Pectus carinatum (chest wall deformity that pulls the sternum and breast bone out)
- Scoliosis (s-like curvature of the spine) or Kyphosis (spine that curves from back to front)
- Flexible joints
- Flat feet
- Dural ectasia (swelling, bulging or widening of the spinal sac)

Features Of Loeys-Dietz syndrome Continued

Some LDS features are different from Marfan syndrome features and are very important for making a correct diagnosis. When a person has these particular features, it is important that the doctor consider LDS. Features that set LDS apart from Marfan syndrome and many other connective tissue disorders include:

- Arterial tortuosity (twisting or spiraled arteries)
- Aneurysms and dissections in arteries other than the aorta
- Hypertelorism (widely-spaced eyes)
- Bifid (split) or broad uvula (the little piece of flesh that hangs down in the back of the mouth)
- Cleft palate (a gap in the roof of the mouth)
- Club foot (when the foot is turned inward and upward at birth)
- Blue sclerae (blue tinge to the whites of the eyes)
- Heart defects at birth such as atrial septal defect, patent ductus arteriosus, bicuspid aortic valve
- Features in the skin such as: easy bruising, wide scars, soft skin texture and translucent skin (almost see-through)
- Gastrointestinal problems such as difficulty absorbing food and chronic diarrhea, abdominal pain, and/or gastrointestinal bleeding and inflammation
- Allergies to food and things in the environment
- Cervical-spine instability (instability in the vertebrae directly below the skull)
- Osteoporosis (Poor mineralization of the bones) that can make the bones more likely to break
- Rupture of the spleen or bowel
- Rupture of the uterus during pregnancy

How Is Loeys-Dietz Diagnosed?

Because LDS was described recently, not all doctors know about LDS and how to tell if a person has LDS or an other connective tissue disorder. A medical geneticist is the kind of doctor most likely to know how to recognize and diagnose LDS. To decide if you have LDS, your doctor will use:

- the health history of you and your family,
- your physical exam,
- the results of special tests including imaging studies of the head, skeleton and blood vessels
- genetic testing to determine if there is a mutation in the TGFBR1, TGFBR2, SMAD3 or TGFB2 genes

The special tests should include both an echocardiogram (to study the heart, its valves and the aorta) and either a computerized tomography (CT) or magnetic resonance (MR) angiogram (study of the blood vessels) with 3-D reconstruction, from the top of the head to the pelvis.

What Should You Do If You Suspect Loeys-Dietz syndrome?

Making a correct diagnosis is complicated. People with LDS features need to see a doctor who knows about LDS to decide if they have the disorder. It is very important that people with LDS get an early and correct diagnosis so they can receive the right treatment.

To Learn More About Loeys-Dietz syndrome

Read the other fact sheets on LDS. Find them online at the Loeys-Dietz Syndrome Foundation Web site at www.loeydietz.org/resources.php.

