Antiphospholipid syndrome

Description

Antiphospholipid syndrome is a disorder characterized by an increased tendency to form abnormal blood clots (thromboses) that can block blood vessels. This clotting tendency is known as thrombophilia. In antiphospholipid syndrome, the thromboses can develop in nearly any blood vessel in the body. If a blood clot forms in the vessels in the brain, blood flow is impaired and can lead to stroke. Antiphospholipid syndrome is an autoimmune disorder. Autoimmune disorders occur when the immune system attacks the body's own tissues and organs.

Women with antiphospholipid syndrome are at increased risk of complications during pregnancy. These complications include pregnancy-induced high blood pressure (preeclampsia), an underdeveloped placenta (placental insufficiency), early delivery, or pregnancy loss (miscarriage). In addition, women with antiphospholipid syndrome are at greater risk of having a thrombosis during pregnancy than at other times during their lives. At birth, infants of mothers with antiphospholipid syndrome may be small and underweight.

A thrombosis or pregnancy complication is typically the first sign of antiphospholipid syndrome. This condition usually appears in early to mid-adulthood but can begin at any age.

Other signs and symptoms of antiphospholipid syndrome that affect blood cells and vessels include a reduced amount of cells involved in blood clotting called platelets (thrombocytopenia), a shortage of red blood cells (anemia) due to their premature breakdown (hemolysis), and a purplish skin discoloration (livedo reticularis) caused by abnormalities in the tiny blood vessels of the skin. In addition, affected individuals may have open sores (ulcers) on the skin, migraine headaches, or heart disease. Many people with antiphospholipid syndrome also have other autoimmune disorders such as systemic lupus erythematosus.

Rarely, people with antiphospholipid syndrome develop thromboses in multiple blood vessels throughout their body. These thromboses block blood flow in affected organs, which impairs their function and ultimately causes organ failure. These individuals are said to have catastrophic antiphospholipid syndrome (CAPS). CAPS typically affects the kidneys, lungs, brain, heart, and liver, and is fatal in over half of affected individuals. Less than 1 percent of individuals with antiphospholipid syndrome develop CAPS.

Frequency

Antiphospholipid syndrome is estimated to affect 1 in 2,000 people. This condition may be responsible for up to one percent of all thromboses. It is estimated that 20 percent of individuals younger than age 50 who have a stroke have antiphospholipid syndrome. Ten to 15 percent of people with systemic lupus erythematosus have antiphospholipid syndrome. Similarly, 10 to 15 percent of women with recurrent miscarriages likely have this condition. Approximately 70 percent of individuals diagnosed with antiphospholipid syndrome are female.

Causes

The genetic cause of antiphospholipid syndrome is unknown. This condition results from the presence of three abnormal immune proteins (antibodies) in the blood. The antibodies that cause antiphospholipid syndrome are called lupus anticoagulant, anticardiolipin, and anti-B2 glycoprotein I. These antibodies are referred to as antiphospholipid antibodies. People with this condition can test positive for one, two, or all three antiphospholipid antibodies in their blood. Antibodies normally attach (bind) to specific foreign particles and germs, marking them for destruction, but the antibodies in antiphospholipid syndrome attack normal human proteins. When these antibodies attach to proteins, the proteins change shape and attach to other molecules and receptors on the surface of cells. Attaching to cells, particularly immune cells, turns on (activates) the blood clotting pathway and other immune responses.

The production of the antiphospholipid antibodies may coincide with exposure to foreign invaders, such as viruses and bacteria, that are similar to normal human proteins. Exposure to these foreign invaders may cause the body to produce antibodies to fight the infection, but because the invaders are so similar to the body's own proteins, the antibodies also attack the human proteins. Similar triggers may occur during pregnancy when a woman's physiology, particularly her immune system, adapts to accommodate the developing fetus. These changes during pregnancy may explain the high rate of affected females.

Certain genetic variations (polymorphisms) in a few genes have been found in people with antiphospholipid syndrome and may predispose individuals to produce the specific antibodies known to contribute to the formation of thromboses. However, the contribution of these genetic changes to the development of the condition is unclear.

People who repeatedly test positive for any of the antiphospholipid antibodies but have not had a thrombosis or recurrent miscarriages are said to be antiphospholipid carriers. These individuals are at greater risk of developing a thrombosis than is the general population. The risk is especially high in people who test positive for all three antiphospholipid antibodies (triple-positive).

Inheritance

Most cases of antiphospholipid syndrome are sporadic, which means they occur in people with no history of the disorder in their family. Rarely, the condition has been

reported to run in families; however, it does not have a clear pattern of inheritance. Multiple genetic and environmental factors likely play a part in determining the risk of developing antiphospholipid syndrome.

Other Names for This Condition

- Anti-phospholipid syndrome
- Antiphospholipid antibody syndrome
- Hughes syndrome

Additional Information & Resources

Genetic and Rare Diseases Information Center

- Antiphospholipid syndrome (https://rarediseases.info.nih.gov/diseases/5824/index)
- Catastrophic antiphospholipid syndrome (https://rarediseases.info.nih.gov/diseases/9820/index)

Patient Support and Advocacy Resources

- National Organization for Rare Disorders (NORD) (https://rarediseases.org/)

Clinical Trials

- ClinicalTrials.gov (https://clinicaltrials.gov/search?cond=%22Antiphospholipid syndrome%22)

Catalog of Genes and Diseases from OMIM

- ANTIPHOSPHOLIPID SYNDROME, FAMILIAL (https://omim.org/entry/107320)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28Antiphospholipid+Syndrome%5BMAJR%5D%29+AND+%28%28antiphospholipid+syndrome%5BTI%5D%29+OR+%28antiphospholipid+antibody+syndrome%5BTI%5D%29%29+AND+review%5Bpt%5D+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D)

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