CONDITION

Hereditary spherocytic anemia

Hereditary spherocytic anemia is an inherited condition in which fragile, round red blood cells are removed too quickly by the spleen.

WHAT IT IS
Inherited red-cell membrane condition causing ongoing anemia

BODY SYSTEM
Blood and spleen

MAIN SYMPTOMS
Tiredness, pale skin, jaundice, enlarged spleen

WHAT CAUSES IT
Inherited changes in red-cell membrane proteins

HOW IT IS DIAGNOSED
Blood tests plus specialized red-cell membrane testing

MAIN TREATMENT
Monitoring, folate support, transfusion, or spleen surgery

CAN IT BE CURED?
Sometimes - splenectomy usually controls anemia, not inheritance

IS IT AN EMERGENCY?
Sometimes - fainting, severe breathlessness, or sudden marked pallor

LONG-TERM OUTLOOK
Usually normal lifespan with monitoring and timely treatment

Overview

Hereditary spherocytic anemia, usually called hereditary spherocytosis, is an inherited blood condition. It affects proteins that help red blood cells keep their normal flexible, disc-like shape.

Affected red blood cells become rounder and more fragile. These cells are called spherocytes. Because they cannot move through the spleen as easily as normal cells, the spleen removes them from the bloodstream sooner than it should.

This early removal is called hemolysis. If the body cannot replace the lost red blood cells quickly enough, anemia develops. Anemia means there are not enough healthy red blood cells to carry oxygen around the body.

Hemolysis also releases bilirubin, a yellow substance produced when red blood cells break down. Excess bilirubin can cause yellow skin or eyes, called jaundice, and may contribute to gallstones.

The condition can be mild, moderate, or severe. Some people have few symptoms and learn they have it only after a blood test. Others develop anemia or jaundice during infancy or childhood. Severity can differ even among members of the same family.

Symptoms

Symptoms reflect anemia, increased red-cell breakdown, or an enlarged spleen. They may be constant or become more noticeable during an infection.

Common symptoms include:

Babies may develop jaundice soon after birth. Significant newborn jaundice needs prompt assessment because high bilirubin levels can be harmful.

Children may appear pale, tire more easily than usual, or grow more slowly if anemia is severe. Some people do not have noticeable symptoms between infections.

A sudden increase in pallor and tiredness can signal a sharp fall in red blood cells. This is different from the usual day-to-day pattern and needs timely medical assessment.

- Tiredness, weakness, or reduced exercise tolerance
- Pale skin or pale tissue inside the eyelids
- Yellow skin or eyes
- An enlarged spleen, sometimes causing fullness under the left ribs
- Darker urine during periods of increased red-cell breakdown
- Gallstone symptoms, such as pain in the upper right abdomen

Causes and risk factors

Hereditary spherocytic anemia is caused by changes in genes that make structural proteins in the red-cell membrane. These proteins include ankyrin, spectrin, band 3, and protein 4.2. When the membrane is unstable, the cell gradually loses part of its outer surface and becomes spherical.

The condition often follows an autosomal dominant inheritance pattern. This means one altered copy of a gene can cause it. Some less common forms are inherited in an autosomal

recessive pattern, which usually requires altered copies from both parents.

A person can also be the first in their family to have the condition because of a new genetic change. Therefore, no known family history does not rule it out.

The main risk factor is having a biological relative with hereditary spherocytosis. It is not caused by diet, stress, infection, or anything a parent did during pregnancy. It is not contagious.

Diagnosis

Diagnosis starts with symptoms, family history, an examination, and blood tests. No single routine blood result confirms every case.

A complete blood count measures red blood cells and hemoglobin, the oxygen-carrying protein in blood. The mean corpuscular hemoglobin concentration, or MCHC, may be higher than expected in hereditary spherocytosis.

A reticulocyte count measures young red blood cells. It is often raised because the bone marrow is trying to replace cells removed by the spleen. Bilirubin and other markers of hemolysis may also be abnormal.

A blood smear allows the cells to be examined under a microscope. Spherocytes may be visible, but they can occur in other conditions as well. In particular, autoimmune hemolytic anemia can also produce round red cells.

A direct antiglobulin test, sometimes called a direct Coombs test, checks whether antibodies are attached to red blood cells. It is usually negative in hereditary spherocytosis and helps distinguish the condition from immune-related hemolysis.

Specialized testing may include an eosin-5-maleimide, or EMA, binding test. This measures proteins on the red-cell surface using a laboratory method called flow cytometry. Osmotic fragility testing or ektacytometry, which measures how red cells behave under stress, may also be used.

Genetic testing can help when results are unclear, the presentation is unusual, or knowing the exact inheritance pattern would be useful. It is not required in every straightforward case. Ultrasound can detect an enlarged spleen or gallstones, but it does not confirm hereditary spherocytosis itself.

Treatment and management

Treatment is based on the severity of anemia, symptoms, complications, age, and the effect on

everyday life.

People with mild hereditary spherocytosis may only need monitoring. Follow-up may include blood counts and checks for jaundice, spleen enlargement, or gallstone symptoms.

Folate is needed to make new red blood cells. Because the bone marrow works harder in this condition, folic acid supplements may be recommended, especially in more active hemolysis or during periods of increased need. The dose and duration should be set by the treating team.

Blood transfusions may be needed for severe anemia, particularly in early childhood or during a temporary crisis. Repeated transfusions require monitoring because excess iron can build up in the body. Iron supplements should not be taken for presumed anemia unless testing shows iron deficiency.

Removing the spleen, called splenectomy, greatly reduces red-cell destruction and often corrects the anemia. However, it does not repair the red-cell membrane or remove the inherited gene change. Surgery is generally considered for significant symptoms or complications rather than for every person with the condition.

Total splenectomy removes the whole spleen. Partial splenectomy leaves some spleen tissue in place, although anemia may return or continue. The choice requires specialist assessment.

The spleen helps protect against certain serious bacterial infections. After splenectomy, infection risk remains increased for life. Vaccination, a clear plan for responding to fever, and sometimes preventive antibiotics like amoxicillin or doxycycline are important parts of care. The exact plan is based on age and local guidance.

Gallbladder removal may be considered when pigment gallstones cause pain or other problems. Gallbladder surgery is not automatically needed simply because stones are present.

Steroid medicines, which may be used for autoimmune hemolytic anemia, do not correct the inherited membrane problem in hereditary spherocytosis.

Complications

Red-cell breakdown may temporarily increase during an infection. This is called a hemolytic crisis and can make jaundice, pallor, and tiredness worse.

An aplastic crisis happens when the bone marrow briefly stops making enough new red blood cells. Parvovirus B19 is a common cause. Because red cells already have a shorter lifespan in hereditary spherocytosis, the hemoglobin level can fall quickly. Severe tiredness, marked pallor, breathlessness, or fainting can occur.

Long-term bilirubin production can lead to pigment gallstones. These may cause upper

abdominal pain, nausea, jaundice, or inflammation of the gallbladder or pancreas.

A very enlarged spleen can cause discomfort and is more vulnerable to injury from a strong blow to the abdomen. People with an enlarged spleen may need advice about contact sports or activities with a risk of abdominal impact.

Iron overload is mainly a concern for people who have received repeated transfusions. It is not the same as ordinary iron-deficiency anemia.

After splenectomy, the major long-term concern is serious infection. There may also be an increased risk of blood clots in some situations, which is considered when discussing the benefits and risks of surgery.

Prevention

Hereditary spherocytic anemia cannot be prevented because it is inherited or results from a new genetic change.

Genetic counseling can explain the likely inheritance pattern and the chance of passing the condition to a child. In the common autosomal dominant form, a parent with the altered gene has a one-in-two chance of passing it on in each pregnancy. Other forms have different inheritance patterns.

Complications can sometimes be reduced through regular follow-up, recommended vaccinations, prompt assessment of unusual anemia symptoms, and appropriate management of gallstones. After splenectomy, following the infection plan provided by the care team is especially important.

Living with it and what to expect

Many people with mild or moderate hereditary spherocytosis lead active lives and have a normal lifespan. Some need little treatment beyond monitoring. Others require transfusions in early life, treatment for gallstones, or splenectomy.

The inherited red-cell change remains throughout life. Symptoms may still fluctuate. An infection can temporarily increase hemolysis, while an aplastic crisis can sharply reduce new blood-cell production.

Children with significant anemia may need closer monitoring of growth and development. Care often moves from a pediatric blood specialist to an adult blood specialist as the child gets older.

Pregnancy can increase the body's need for red blood cells and folate. Someone with hereditary spherocytosis who is pregnant or planning pregnancy may need additional blood tests and coordinated care. This does not mean complications are certain.

After a successful splenectomy, anemia and jaundice usually improve substantially. Spherocytes remain in the blood because the underlying membrane change has not gone away. The lifelong infection precautions associated with having no spleen continue even when blood counts are normal.

Exercise is usually possible. If the spleen is enlarged, activities involving collisions or abdominal impact may need to be limited. Individual advice should account for spleen size, symptoms, and the specific activity.

Routine follow-up remains useful even when you feel well. It can identify changes in anemia and provide a chance to review gallstone symptoms, vaccination status, pregnancy plans, or the long-term effects of transfusions or spleen surgery.

When to get medical help

Seek emergency care for:

If you have had your spleen removed, fever can be an early sign of a serious infection. Follow your emergency infection plan and seek urgent medical assessment rather than waiting for symptoms to settle.

A baby with worsening jaundice, poor feeding, unusual sleepiness, or breathing difficulty needs prompt assessment.

Arrange urgent or same-day advice for a sudden change in tiredness or pallor, especially during an infection or after known exposure to parvovirus B19. These symptoms may indicate a rapid fall in hemoglobin.

Routine follow-up is appropriate for stable tiredness, recurring mild jaundice, abdominal fullness, or questions about exercise, pregnancy, vaccination, or family testing.

- Fainting, severe breathlessness, confusion, or difficulty waking
- Rapidly worsening pallor with extreme weakness
- Severe abdominal pain with fever, repeated vomiting, or worsening jaundice
- A significant blow to the abdomen followed by pain, dizziness, or faintness

Common questions

Is hereditary spherocytic anemia the same as iron-deficiency anemia?

No. Hereditary spherocytic anemia results from early destruction of abnormal red blood cells. Iron-deficiency anemia happens when the body does not have enough iron. Taking iron will not correct hereditary spherocytosis unless separate testing also confirms iron deficiency.

Can hereditary spherocytosis be cured?

Splenectomy can stop most of the excessive red-cell destruction and may correct the anemia. It does not remove the inherited gene change or restore the cells' normal shape. Surgery also creates a lifelong increased risk of serious infection, so it is not appropriate for everyone.

Will my children inherit it?

That depends on the genetic form. With the common autosomal dominant form, each child has a one-in-two chance of inheriting the altered gene. Recessive forms follow a different pattern. Genetic counseling can clarify the likely risk for a particular family.

Why does removing the spleen help?

The spleen filters blood and removes abnormal red cells. In hereditary spherocytosis, it recognizes the round, less flexible cells and removes them early. Removing the spleen allows those cells to circulate longer, although they remain abnormally shaped.

Can I exercise with an enlarged spleen?

Many forms of exercise are possible, but a strong impact can injure an enlarged spleen. Contact sports and activities with a high risk of abdominal blows may need to be avoided or modified. Advice should be based on the size of the spleen and the activity involved.

Does hereditary spherocytosis cause gallstones?

It can. Ongoing red-cell breakdown produces extra bilirubin, which may form pigment gallstones. Gallstones that cause no symptoms may only need observation. Persistent upper abdominal pain, fever, vomiting, or worsening jaundice needs medical assessment.

Sources

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