CONDITION

Hemolytic anemia

Hemolytic anemia is anemia caused when red blood cells are destroyed faster than the body can replace them.

WHAT IT IS
Anemia caused by red blood cells breaking down too early

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Tiredness, breathlessness, jaundice, dark urine

WHAT CAUSES IT
Immune reactions, infections, inherited conditions, medicines

HOW IT IS DIAGNOSED
Blood counts and tests showing red cell breakdown

MAIN TREATMENT
Cause-directed treatment, supportive care, sometimes transfusion or surgery

CAN IT BE CURED?
Sometimes - removable causes or treatable underlying disorders

IS IT AN EMERGENCY?
Sometimes - severe breathlessness, chest pain, or fainting

LONG-TERM OUTLOOK
Many remain well; severe underlying causes can shorten life

Overview

Hemolytic anemia happens when red blood cells are destroyed faster than the bone marrow can replace them. This early destruction is called hemolysis .

Red blood cells carry oxygen from your lungs to the rest of your body. They normally circulate for about 120 days. In hemolytic anemia, they may survive for a much shorter time. If replacement cannot keep up, the number of red blood cells falls and anemia develops.

Hemolytic anemia is a condition with many possible causes rather than one single disease. It can begin suddenly or develop gradually. It may be mild and found on a routine blood test, or severe enough to require treatment in hospital.

Some forms mainly destroy cells in the spleen or liver. Others destroy them within blood

vessels. This difference can affect the symptoms, test results, and risk of complications.

Finding the cause matters because treatment for an immune reaction is different from treatment for an infection, inherited condition, medicine reaction, or mechanical problem such as an artificial heart valve.

Symptoms

Symptoms depend on how quickly red blood cells are being destroyed and how low the red blood cell level becomes. Gradual anemia may cause few symptoms at first because the body has time to adjust. Rapid hemolysis is usually more noticeable.

Possible symptoms include:

Jaundice develops when red blood cells release hemoglobin, their oxygen-carrying protein. The body breaks hemoglobin down into bilirubin, a yellow pigment. If bilirubin builds up, the skin and whites of the eyes may turn yellow.

Dark urine can occur when hemoglobin passes into the urine. It may also have other causes, including dehydration, liver problems, bleeding, or certain foods and medicines. The colour alone cannot confirm hemolysis.

Babies and children may also have poor feeding, unusual sleepiness, delayed growth, or jaundice. Symptoms in any age group need to be interpreted alongside an examination and blood tests.

- Tiredness, weakness, dizziness, or reduced stamina
- Shortness of breath, especially during activity
- A fast or pounding heartbeat
- Pale skin, lips, or nail beds
- Yellow skin or eyes, called jaundice
- Dark brown, red, or tea-coloured urine
- Pain or fullness in the upper left abdomen from an enlarged spleen
- Back or abdominal pain during a sudden episode

Causes and risk factors

Hemolytic anemia may be inherited or acquired later in life.

Inherited forms result from gene changes affecting the structure, enzymes, or outer membrane of red blood cells. Examples include sickle cell disease, thalassemia, hereditary spherocytosis, and glucose-6-phosphate dehydrogenase deficiency, often shortened to G6PD deficiency.

Acquired hemolytic anemia has several possible causes:

In G6PD deficiency, hemolysis may be triggered by an infection, certain medicines, or substances such as mothballs. Not everyone with the gene change has ongoing anemia.

Sometimes testing does not identify a cause. This may be described as idiopathic hemolytic anemia, meaning the cause remains unknown after investigation.

- Autoimmune hemolytic anemia: The immune system mistakenly makes antibodies that attack red blood cells
- Infections: Malaria and some bacterial or viral infections can directly or indirectly cause hemolysis
- Medicines: Certain medicines may trigger immune destruction or damage susceptible red blood cells
- Blood transfusion reactions: This can happen if the immune system attacks incompatible donated cells
- Mechanical damage: Artificial heart valves, heart-support devices, or severe blood vessel abnormalities can damage cells as they circulate
- Other conditions: Some blood cancers, autoimmune conditions, severe burns, liver disease, and uncommon clotting disorders can cause hemolysis
- Pregnancy-related disorders: Rare but serious complications can damage red blood cells and other organs

Diagnosis

Diagnosis usually starts with a complete blood count. This measures red blood cells and hemoglobin, among other parts of the blood. A low hemoglobin level confirms anemia but does not show its cause.

Several tests look for evidence that red blood cells are being destroyed:

A direct antiglobulin test, also called a direct Coombs test, checks whether antibodies or immune proteins are attached to red blood cells. A positive result supports an immune cause, although it must be considered with the other findings.

Further testing is chosen according to the suspected cause. It may include tests for G6PD

deficiency, abnormal hemoglobin, infections, autoimmune conditions, or specific gene changes. Scans may be used to assess the spleen or look for an underlying condition. A bone marrow test is needed only in selected cases.

Recent transfusions, medicines, infections, travel, family history, and the timing of symptoms can provide important clues.

- A reticulocyte count measures young red blood cells; it is often high because the bone marrow is trying to replace lost cells
- Bilirubin and lactate dehydrogenase , or LDH, may rise during hemolysis
- Haptoglobin , a protein that binds released hemoglobin, may fall
- A blood film examines the size and shape of cells under a microscope
- Urine testing may detect hemoglobin or other signs of red cell breakdown

Treatment and management

Treatment is based on the cause, how quickly hemolysis is happening, and how the anemia is affecting you. Mild, stable cases may need monitoring rather than immediate treatment.

If a medicine appears to be responsible, a healthcare professional may recommend stopping or replacing it. Do not stop a prescribed medicine without advice unless emergency services tell you to do so.

Autoimmune hemolytic anemia is often treated with medicines that reduce the immune attack. Corticosteroids like prednisone or hydrocortisone are commonly used for some forms. Other options can include targeted antibody treatment, additional immune-suppressing medicines, or removal of the spleen. The best approach differs between warm, cold, and medicine-related immune hemolysis.

An infection is treated when a specific treatment is available. Mechanical hemolysis may improve if a damaged heart valve or medical device can be repaired or replaced.

Some inherited conditions have their own treatments. Management may include avoiding known triggers, specialist medicines, transfusions, or procedures that reduce red cell destruction. Genetic counselling can help families understand how an inherited condition may be passed on.

A red blood cell transfusion may be needed when anemia is severe or causing significant symptoms. Matching blood can take longer when antibodies are present, but urgent transfusion may still be given when the clinical need is greater than the matching difficulty.

Folic acid may be recommended in some long-lasting forms because the bone marrow uses

more folate while making replacement cells. Iron is not a routine treatment for hemolytic anemia. It is useful only when testing also shows iron deficiency; unnecessary iron can accumulate in the body.

Removal of the spleen, called splenectomy, is considered only for selected causes. The spleen helps protect against infection, so vaccination and infection planning are important before and after this operation.

Complications

Severe anemia can reduce the oxygen reaching organs. This may strain the heart and cause chest pain, abnormal heart rhythms, or heart failure, particularly in people who already have heart or lung disease.

Rapid destruction within blood vessels can release large amounts of hemoglobin. In severe cases, this may contribute to kidney injury.

Long-term bilirubin buildup can lead to pigment gallstones. These may cause pain in the upper right abdomen, nausea, or inflammation of the gallbladder.

Repeated transfusions can lead to excess iron in the liver, heart, or hormone-producing organs. People who need regular transfusions may be monitored for iron overload and treated to remove excess iron when necessary.

Some forms of hemolytic anemia are linked with a higher risk of blood clots. The risk is influenced by the underlying cause, whether hemolysis is active, and other personal risk factors.

Complications from treatment are also possible. Immune-suppressing medicines can increase infection risk, while splenectomy creates a lifelong risk of serious infection.

Prevention

Many forms of hemolytic anemia cannot be prevented. Inherited gene changes cannot be prevented, and autoimmune hemolysis often develops without a known avoidable cause.

If you have a diagnosed trigger-sensitive condition such as G6PD deficiency, avoiding known problem medicines and chemicals can reduce episodes. A healthcare professional or pharmacist can check whether a medicine is suitable for your specific condition.

Prompt treatment of infections may reduce hemolysis in some people. Recommended vaccinations are especially important for people without a functioning spleen or those taking

medicines that weaken immune responses.

Careful blood typing and compatibility testing help prevent hemolytic transfusion reactions. If you have previously had a transfusion reaction or red cell antibody, make sure this information is included in your medical record.

Living with it and what to expect

The course of hemolytic anemia is closely tied to its cause. A short-lived reaction to an infection or medicine may settle after the trigger is removed. An inherited condition or ongoing immune disorder may require monitoring over many years.

Blood results can improve even when the underlying tendency remains. Some people have long periods without symptoms, followed by episodes triggered by infection, pregnancy, another illness, or changes in treatment. Others have persistent but stable anemia.

Follow-up may include blood counts and tests for bilirubin, LDH, haptoglobin, kidney function, and iron levels. The exact schedule is based on the type and severity of hemolysis and the treatments used.

During active anemia, you may need to reduce strenuous activity because your blood carries less oxygen. Activity can usually be increased gradually as symptoms and blood counts improve. Stop and seek advice if exercise causes unusual breathlessness, chest discomfort, dizziness, or a racing heartbeat.

It can help to keep an up-to-date list of medicines, previous transfusions, antibodies, and known triggers. If you have an inherited form, relatives may sometimes be offered testing or genetic counselling.

Many people with a stable or treatable cause continue their usual work, education, family life, and activities. More severe forms can require regular treatment and may affect energy, travel planning, pregnancy care, or the safety of certain medicines.

When to get medical help

Arrange routine or prompt follow-up if you develop increasing tiredness, mild breathlessness, yellowing of the eyes, dark urine, or reduced ability to manage normal activities. These symptoms need assessment but are not always an emergency.

Seek urgent same-day medical care for rapidly worsening jaundice, new dark or red urine with weakness, a very fast heartbeat, fever during immune-suppressing treatment, or symptoms

following a blood transfusion.

If you do not have a functioning spleen, fever or feeling suddenly very unwell needs urgent assessment because serious infections can progress quickly.

Call emergency services for:

Do not drive yourself if you feel faint, confused, or severely short of breath.

- Severe difficulty breathing at rest
- Chest pain or pressure
- Fainting, confusion, or difficulty waking
- Blue or grey lips
- Signs of shock, such as cold clammy skin with marked weakness
- Severe symptoms beginning during a blood transfusion

Common questions

Is hemolytic anemia cancer?

No. Hemolytic anemia is not itself cancer. However, some blood cancers can trigger immune hemolysis, so testing may look for an underlying condition when the cause is not clear.

Can hemolytic anemia go away?

Sometimes. Hemolysis caused by a temporary infection or removable medicine may resolve. Autoimmune or inherited forms may return or require long-term management. Recovery also depends on whether the bone marrow can make replacement cells.

Is hemolytic anemia inherited?

Some forms are inherited, including sickle cell disease, thalassemia, hereditary spherocytosis, and G6PD deficiency. Other forms are acquired and are not passed from parent to child.

Is hemolytic anemia contagious?

No. Hemolytic anemia cannot spread between people. An infection that triggers hemolysis may be contagious, but the anemia itself is not.

Why does hemolytic anemia cause dark urine?

When red blood cells break apart inside blood vessels, released hemoglobin may pass through the kidneys into the urine. Bilirubin and dehydration can also change urine colour. A urine test helps identify the cause.

Can I exercise with hemolytic anemia?

Many people can remain active when their condition is stable. During significant anemia, intense exercise may worsen breathlessness, dizziness, or palpitations. Activity should match your symptoms and the advice given for your underlying condition.

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