CONDITION

Redwater fever

Redwater fever is a tick-borne infection in which Babesia parasites invade and destroy red blood cells.

WHAT IT IS
Babesia parasite infection of red blood cells

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Fever, chills, fatigue, dark urine

WHAT CAUSES IT
Infection with Babesia parasites

HOW IT IS DIAGNOSED
Blood smear microscopy and PCR

MAIN TREATMENT
Antiparasitic medicine combinations

CAN IT BE CURED?
Yes, though immune problems can cause relapse

IS IT AN EMERGENCY?
Sometimes, with breathing trouble, confusion, or collapse

LONG-TERM OUTLOOK
Most recover; severe illness is possible in high-risk people

Overview

Redwater fever is a name sometimes used for babesiosis , an infection caused by microscopic parasites called Babesia . The parasites enter red blood cells, reproduce inside them, and can cause the cells to break apart.

The term "redwater" comes from the red or dark brown urine that can occur when many red blood cells are destroyed. This colour is often caused by haemoglobin, the oxygen-carrying protein released from damaged blood cells. It is not always caused by bleeding into the urine.

"Redwater fever" is used more often for babesiosis in cattle and other animals. In human healthcare, the condition is usually called babesiosis. The Babesia species that commonly infect people are not always the same as those affecting livestock.

Most human infections follow the bite of an infected tick. Some people have no symptoms, while others develop a flu-like illness and anaemia, meaning they do not have enough healthy red blood cells. Severe illness is uncommon but is more likely in people without a working spleen or with a weakened immune system.

Symptoms

Symptoms may begin several weeks after a tick bite, but the timing is not always clear. Tick bites are often painless, and the tick may be too small to notice.

Common symptoms include:

The destruction of red blood cells can cause haemolytic anaemia. "Haemolytic" means that blood cells are breaking down faster than the body can replace them. Anaemia may cause pale skin, shortness of breath, dizziness, a fast heartbeat, or unusual tiredness.

Some people have a very mild illness or no symptoms at all. Unlike Lyme disease, babesiosis does not usually cause a spreading bull's-eye skin rash. However, the same type of tick can carry both infections, so they can occur together.

Dark urine has several possible causes and does not by itself confirm redwater fever. Blood, dehydration, liver problems, muscle injury, medicines, and certain foods can also change urine colour.

- Fever, chills, and sweating
- Marked tiredness or weakness
- Headache and muscle aches
- Reduced appetite or nausea
- Dark red or brown urine
- Yellow skin or eyes, known as jaundice

Causes and risk factors

Redwater fever is caused by Babesia parasites. In many parts of the United States, the main human infection is caused by Babesia microti . Other species occur in Europe and elsewhere.

The parasites are usually spread through the bite of an infected Ixodes tick. These ticks can also carry the bacteria that cause Lyme disease. Risk is higher in places where infected ticks and their animal hosts are established, especially during seasons when young ticks are active.

Less commonly, babesiosis can spread through:

It does not spread through coughing, touching, sharing food, or ordinary household contact.

Anyone exposed to infected ticks can develop babesiosis. The chance of serious illness is higher in people who:

The spleen helps remove infected red blood cells and control blood parasites. People without a working spleen may become unwell more quickly and need prompt assessment if symptoms develop.

- Transfusion of infected donated blood
- Transmission from a pregnant person to the baby
- An infected donated organ
- Do not have a spleen or whose spleen does not work normally
- Have a weakened immune system
- Are receiving treatment that suppresses immune cells
- Have cancer, HIV, or another condition affecting immunity
- Are older or have major heart, lung, kidney, or liver problems

Diagnosis

Symptoms alone cannot confirm redwater fever because several infections and blood conditions can look similar. A healthcare professional may ask about tick exposure, travel, blood transfusions, immune conditions, and whether you have a spleen.

The infection is confirmed by finding evidence of Babesia in the blood. The main tests are:

More than one blood smear may be needed because parasites can be missed when only a small number of cells are infected.

An antibody blood test can show that the immune system has encountered Babesia . However, antibodies may remain after an older infection, so this test alone does not reliably confirm that parasites are currently active.

Other blood tests assess the effects of the infection. They may show anaemia, a low platelet count, or raised levels of bilirubin and other substances released when red blood cells break down. Kidney and liver tests help identify complications.

- Blood smear microscopy: A thin layer of blood is examined under a microscope for parasites inside red blood cells

- Polymerase chain reaction, or PCR: This test looks for genetic material from the parasite and can detect low levels of infection

Treatment and management

Treatment depends on whether symptoms are present, how severe they are, and whether the immune system is working normally.

Most people who need treatment receive a combination of antiparasitic medicines. Atovaquone with azithromycin is commonly used. Clindamycin with quinine is an alternative in some situations. These medicines work in different ways to clear parasites from red blood cells.

The choice and length of treatment require medical supervision. People with weakened immunity may need a longer course and repeated blood testing because infection can persist or return.

Someone who has a positive test but no symptoms may not always need medicine. The decision is based on repeat testing, health risks, and whether parasites remain detectable.

Severe babesiosis is treated in hospital. Care may include fluids, oxygen, monitoring of blood counts and organ function, and treatment of complications. If a large proportion of red blood cells are infected or organs are being affected, an exchange transfusion may be considered. This procedure removes some infected blood and replaces it with donor blood.

Symptoms may improve before all laboratory results return to normal. Follow-up blood tests are particularly important for people at risk of persistent infection.

Complications

The main complication is severe haemolytic anaemia. If too many red blood cells are destroyed, the body may not carry enough oxygen to its tissues.

Other possible complications include:

Severe infection can affect several organs at once. This is more likely in people without a spleen or with markedly weakened immunity, but it can occasionally occur in others.

Persistent or relapsing infection is possible when the immune system cannot fully control the parasite. A relapse means symptoms and detectable parasites return after an earlier improvement.

- Very low platelet levels and abnormal bleeding
- Kidney injury
- Liver problems and jaundice
- Fluid or inflammation in the lungs
- Low blood pressure
- Irregular heart rhythm or heart strain
- Abnormal widespread blood clotting
- Rarely, damage or rupture of the spleen

Prevention

There is no vaccine that prevents human babesiosis. Not every tick exposure can be avoided, but reducing tick bites lowers the risk.

When spending time in wooded, brushy, or grassy areas:

Pay particular attention to the scalp, behind the ears, armpits, waist, groin, behind the knees, and between the toes. Remove an attached tick with fine-tipped tweezers by gripping it close to the skin and pulling upward steadily.

Removing ticks promptly may reduce the chance of infection, although no exact safe attachment time can be guaranteed.

Screening of donated blood helps reduce transfusion-related babesiosis in places where screening is used. If you have been diagnosed with babesiosis, follow the blood donation service's eligibility rules before donating again.

- Use an appropriate tick repellent according to its label
- Wear long trousers and closed shoes where practical
- Treat clothing or equipment with permethrin products made for that purpose
- Check your body, clothing, children, and pets for ticks afterward
- Shower soon after returning indoors

Living with it and what to expect

Most otherwise healthy people who develop symptoms recover with appropriate treatment. Fever and chills often settle before tiredness does. Weakness may continue for several weeks

while the body replaces damaged red blood cells.

Follow-up may include blood counts and tests for the parasite. People whose immune systems work normally do not always need repeated parasite testing once symptoms have fully resolved. Those with weakened immunity may need closer monitoring over months because relapse is more likely.

A previous infection does not guarantee lifelong protection. Reinfection can occur after another infected tick bite, so tick precautions remain useful.

Some people have no symptoms but continue to carry low levels of the parasite for a time. This matters mainly for blood donation and for people who later develop significant immune suppression.

Long-term organ damage is not expected after an uncomplicated infection. Recovery can take longer after severe anaemia, kidney injury, or an intensive care admission. The course is less predictable for people with major immune problems, who may need prolonged treatment and specialist follow-up.

When to get medical help

Arrange prompt medical assessment if you develop fever, chills, unusual weakness, jaundice, or dark urine after possible tick exposure. Mention recent travel, outdoor activity, blood transfusions, and whether you have a spleen.

Seek same-day medical advice if symptoms are worsening or if you have dark urine with reduced urination, increasing breathlessness, marked dizziness, or a fast heartbeat. People without a working spleen or with a severely weakened immune system should seek prompt assessment for fever even if other symptoms seem mild.

Call emergency services if there is:

A tick bite without symptoms is not usually an emergency. Routine testing immediately after a bite may not detect a new infection. A healthcare professional can advise whether observation or later testing is appropriate based on the exposure and your health risks.

- Severe difficulty breathing
- New confusion, fainting, or difficulty waking
- Chest pain or collapse
- Blue or grey lips or skin
- Heavy bleeding or rapidly worsening weakness

Common questions

Is redwater fever the same as babesiosis?

In human healthcare, redwater fever usually refers to babesiosis. However, "redwater" is more commonly used for related infections in cattle and other animals. Human and animal infections may involve different Babesia species.

Why does redwater fever make urine look red or brown?

The parasites can destroy red blood cells. This releases haemoglobin, which may pass into the urine and make it look red, tea-coloured, or dark brown. Dark urine can have other causes, so testing is needed.

Can I catch it from another person?

Babesiosis does not spread through ordinary contact. Most infections come from ticks. Rare routes include infected blood transfusions, donated organs, and transmission during pregnancy.

Will babesiosis go away without treatment?

Some people with no symptoms clear or control the infection without medicine. Symptomatic infection is generally treated because it can cause anaemia and other complications. People with weakened immunity are less likely to clear it without treatment.

Can I get redwater fever more than once?

Yes. A previous infection does not provide reliable lifelong immunity. Another infected tick bite can cause reinfection.

Does every infected tick cause babesiosis?

No. Not every tick carries Babesia , and an infected tick does not always transmit it. The risk is influenced by the tick species, local infection rates, and how long it remains attached.

Sources

- Centers for Disease Control and Prevention. About Babesiosis . Updated May 15, 2024
- Centers for Disease Control and Prevention. Clinical Overview of Babesiosis . Updated February 13, 2024
- Centers for Disease Control and Prevention. Clinical Care and Treatment of Babesiosis . Updated February 13, 2024

- Krause PJ, Auwaerter PG, Bannuru RR, and colleagues. Clinical Practice Guidelines by the Infectious Diseases Society of America: 2020 Guideline on Diagnosis and Management of Babesiosis . Clinical Infectious Diseases . 2021;72(2):e49-e64
- Vannier E, Krause PJ. Human Babesiosis . New England Journal of Medicine . 2012;366:2397-2407