CONDITION

Ehrlichiosis

Ehrlichiosis is a bacterial infection spread by ticks that can cause fever, headache, and muscle aches.

WHAT IT IS
Acute bacterial infection spread by ticks

BODY SYSTEM
Blood, immune system, and multiple organs

MAIN SYMPTOMS
Fever, headache, muscle aches, nausea

WHAT CAUSES IT
Infection with Ehrlichia bacteria

HOW IT IS DIAGNOSED
Blood PCR or paired antibody tests

MAIN TREATMENT
Antibiotics started as soon as suspected

CAN IT BE CURED?
Yes - antibiotics usually clear the infection

IS IT AN EMERGENCY?
Sometimes - confusion or trouble breathing needs emergency care

LONG-TERM OUTLOOK
Most people recover fully with prompt treatment

Overview

Ehrlichiosis is an infection caused by Ehrlichia bacteria and usually spread through the bite of an infected tick. The bacteria enter certain white blood cells and can affect organs throughout the body.

In the United States, most cases are linked to the lone star tick, which is common in southeastern, south-central, and eastern areas. A less common type found mainly in Minnesota and Wisconsin is associated with the blacklegged tick.

Ehrlichiosis usually begins as a flu-like illness. Fever, headache, muscle aches, and tiredness are common. Some people also have digestive symptoms or a rash. Because these symptoms overlap with many infections, a recent tick bite or time spent in tick habitat can be an important clue.

Prompt treatment matters. Ehrlichiosis can become serious if treatment is delayed, but most people recover when the right antibiotic like amoxicillin or doxycycline is started early. Treatment may begin before blood test results are available.

Symptoms

Symptoms usually begin about 5 to 14 days after the bite of an infected tick. Many people do not remember being bitten because ticks can be small and their bites are often painless.

Early symptoms may include:

A rash can occur, especially in children, but many people never develop one. It often appears several days after the fever begins and may look like flat red areas, small raised spots, or pinpoint red or purple marks. It is usually not centered on the tick bite.

Blood tests may show low white blood cell or platelet counts or signs of liver irritation. These findings can support the diagnosis but also occur with other conditions.

Symptoms can worsen quickly. Severe illness may affect the brain, lungs, heart, kidneys, or blood-clotting system.

- Fever or chills
- Headache
- Muscle aches
- Marked tiredness
- Nausea, vomiting, diarrhea, or reduced appetite
- Confusion or feeling very unwell

Causes and risk factors

Ehrlichiosis is caused by bacteria in the Ehrlichia group. Ehrlichia chaffeensis is the most common cause in the United States. Other species include Ehrlichia ewingii and Ehrlichia muris eauclairensis .

The bacteria are mainly spread through attached infected ticks. Ehrlichiosis does not spread through ordinary contact, coughing, sharing food, or touching someone who has it. Rare transmission through donated blood or transplanted organs has been reported.

Exposure is more likely during warmer months and during activities such as hiking, hunting, gardening, camping, or working in wooded or brushy places.

Severe illness is more likely in people with weakened immune systems, older adults, and people whose treatment is delayed, although it can occur at any age. Pets may bring ticks near a home but do not directly pass ehrlichiosis to people.

Diagnosis

A healthcare professional considers your symptoms, possible tick exposure, local tick activity, examination, and blood test results. Not remembering a tick bite does not rule out ehrlichiosis.

A polymerase chain reaction, or PCR, test looks for bacterial genetic material in blood. It is most useful during the first week of illness, and its ability to detect infection can fall soon after antibiotics begin. A negative result does not always exclude ehrlichiosis.

Antibody testing checks the immune response. The preferred approach uses one blood sample early in the illness and another several weeks later. A clear rise in immunoglobulin G, or IgG, antibodies helps confirm recent infection.

Antibody tests may be negative during the first week. Immunoglobulin M, or IgM, results are less reliable and should not be used alone. Antibodies can remain after recovery, so one positive result does not necessarily show an active infection.

Clusters of bacteria called morulae may occasionally be seen inside white blood cells, but their absence does not rule out ehrlichiosis.

Treatment should not be delayed while awaiting confirmation if ehrlichiosis is strongly suspected.

Treatment and management

Doxycycline is the standard first treatment for adults and children of all ages when ehrlichiosis is suspected. A healthcare professional chooses the dose and treatment length based on age, body size, symptoms, and response. Complete the prescribed course even if you feel better.

Treatment often begins before test results return because early therapy reduces the risk of severe illness. Concerns about a short course of doxycycline should not delay treatment in children.

Fever commonly begins to improve within one or two days. If fever continues or symptoms worsen, further assessment is needed because another infection, a complication, or a different diagnosis may be responsible.

Mild illness may be treated at home with medical follow-up. Hospital care may be needed for

severe symptoms, dehydration, organ problems, or difficulty taking medicine by mouth. Treatment may include intravenous antibiotics, fluids, oxygen, and organ support.

Prolonged antibiotics have no established benefit after an appropriate course. Ongoing symptoms should be assessed rather than assumed to represent persistent infection.

Complications

Untreated or delayed treatment can lead to:

Ehrlichiosis can be fatal, although prompt treatment greatly improves the outlook. People who become seriously ill may need longer to recover from organ injury or a hospital stay.

- Inflammation of the brain or surrounding tissues
- Confusion, seizures, or coma
- Severe breathing problems or respiratory failure
- Kidney or liver injury
- Abnormal bleeding or widespread blood-clotting problems
- Shock
- Failure of multiple organs

Prevention

There is no vaccine for ehrlichiosis. Prevention focuses on avoiding tick bites and promptly removing attached ticks.

When you are in wooded, brushy, or grassy areas:

Check the scalp, hairline, behind the ears, armpits, waist, groin, backs of the knees, and between the legs.

To remove a tick, use fine-tipped tweezers. Grasp it close to the skin and pull upward with steady pressure. Clean the bite area and your hands afterward. Do not burn the tick or cover it with substances intended to make it detach.

Antibiotics after every tick bite are not recommended to prevent ehrlichiosis. Instead, watch for fever or other symptoms during the next two weeks and seek medical advice if they develop.

- Use an insect repellent registered for protection against ticks

- Treat clothing and equipment with an appropriate permethrin product
- Wear long trousers and closed shoes when practical
- Walk near the center of trails and avoid dense brush
- Check your body, clothing, equipment, children, and pets afterward
- Shower soon after returning indoors to help find unattached ticks

Living with it and what to expect

Ehrlichiosis is usually a short-term infection. Most people treated promptly recover fully. Fever often settles first, while tiredness, appetite, and stamina may take longer to improve.

Recovery from mild infection may take days to a few weeks. It can take longer after severe illness, especially if organs were affected. Follow-up blood tests may be used to confirm that blood counts or liver irritation are improving.

There is no good evidence that properly treated ehrlichiosis becomes chronic. Persistent fatigue, pain, fever, or concentration problems need assessment because they may reflect recovery from severe illness, a complication, another tick-borne infection, or an unrelated condition.

Previous infection does not provide reliable lifelong protection. Continue taking tick precautions.

Follow-up may be appropriate if symptoms improve slowly, blood tests were abnormal, or you were admitted to hospital. Seek earlier review if fever returns, new symptoms develop, or recovery moves in the wrong direction.

When to get medical help

Contact a healthcare professional promptly if you develop fever, severe headache, marked muscle aches, or unusual tiredness after a tick bite or time in tick habitat. Mention where and when you may have been exposed. Do not wait for a rash, because many people do not develop one.

Same-day assessment is particularly important if symptoms are worsening, you cannot keep fluids down, or you have a weakened immune system. Early tests may not confirm the infection, so treatment may be based on the overall clinical picture.

Seek emergency care for:

These symptoms can signal serious complications that need immediate care.

- New confusion, extreme drowsiness, fainting, or a seizure
- Trouble breathing, blue or grey lips, or severe chest discomfort
- Signs of shock, such as cold, clammy skin or difficulty staying awake
- Uncontrolled bleeding or a rapidly spreading purple rash
- Severe weakness with very little urine

Common questions

Is ehrlichiosis the same as Lyme disease?

No. They are caused by different bacteria and often carried by different tick species. A person can occasionally have more than one tick-borne infection.

Can I have ehrlichiosis without a rash?

Yes. Many people, particularly adults, never develop a rash.

Can I get ehrlichiosis if I never saw a tick?

Yes. Ticks can be small, and their bites are often painless. A known bite is not required for diagnosis.

Is ehrlichiosis contagious?

It does not spread through ordinary contact, coughing, kissing, or sharing household items. Rare transmission through donated blood or transplanted organs has occurred.

How soon will I feel better after antibiotics?

Fever often improves within 24 to 48 hours, although tiredness may last longer. Contact your healthcare professional if symptoms do not improve or worsen.

Can ehrlichiosis come back after treatment?

An appropriately treated infection is not expected to remain active for months or years, but another infected tick can cause a new infection. Ongoing or returning symptoms require assessment rather than additional antibiotics without a clear diagnosis.

Sources

- Centers for Disease Control and Prevention. "About Ehrlichiosis." Updated May 15, 2024.



- Centers for Disease Control and Prevention. "Signs and Symptoms of Ehrlichiosis." Updated May 15, 2024.
- Centers for Disease Control and Prevention. "Clinical Testing and Diagnosis for Ehrlichiosis." Updated May 15, 2024.
- Centers for Disease Control and Prevention. "Clinical Care of Ehrlichiosis." Updated May 15, 2024.
- Biggs HM, Behravesh CB, Bradley KK, et al. "Diagnosis and Management of Tickborne Rickettsial Diseases: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichioses, and Anaplasmosis-United States." MMWR Recommendations and Reports . 2016;65(2):1-44.