CONDITION

Rat-bite fever

Rat-bite fever is a bacterial infection linked to contact with rats, other rodents, or contaminated food and drink.

WHAT IT IS
Bacterial infection caught from rats and other rodents

BODY SYSTEM
Whole body, especially skin, joints, and heart

MAIN SYMPTOMS
Fever, rash, joint pain, vomiting

WHAT CAUSES IT
Infection with Streptobacillus or Spirillum bacteria

HOW IT IS DIAGNOSED
Blood, joint-fluid, or tissue testing for bacteria

MAIN TREATMENT
Antibiotics

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

IS IT AN EMERGENCY?
Sometimes - confusion, breathing trouble, or severe weakness

LONG-TERM OUTLOOK
Most recover fully with prompt antibiotic treatment

Overview

Rat-bite fever is a bacterial infection associated with rats and other rodents. Despite its name, it can spread without a bite. Scratches, close contact with rodent saliva or urine, and contaminated food or drink can also pass on the bacteria.

Two main bacteria cause the condition. Streptobacillus moniliformis causes most reported cases in North America. Spirillum minus is reported more often in Asia, where the infection is sometimes called sodoku. The symptoms and available laboratory tests differ slightly between the two.

Rat-bite fever can affect people who handle pet, laboratory, feeder, or wild rodents. A rat may carry the bacteria without looking ill.

The infection is treatable with antibiotics like amoxicillin or doxycycline . Prompt assessment matters because untreated infection can occasionally spread to the joints, heart, brain, lungs, or other organs. A bite or scratch may have healed by the time symptoms begin, so it is important to mention any recent rodent exposure when seeking care.

Symptoms

Symptoms usually begin within days or a few weeks of exposure. The timing depends partly on which bacterium is involved.

In infection caused by Streptobacillus moniliformis , early symptoms may include:

The rash often appears after the fever starts. It may affect the hands and feet, including the palms and soles. Some spots can look red or purple. Joint pain may move from one joint to another, and some joints can become swollen.

The original bite or scratch often looks healed and may not be painful when these symptoms develop.

Infection caused by Spirillum minus may begin later. The bite area can become swollen or form an ulcer after appearing to heal. Nearby lymph nodes may enlarge. Fever may disappear and return in episodes, and a red or purple rash may develop.

Not everyone has every symptom. A rash may be absent, and fever with joint pain can have many other causes. Symptoms alone cannot confirm rat-bite fever.

- Fever or chills
- Headache
- Muscle or joint pain
- Nausea or vomiting
- Sore throat
- A blotchy, flat, or slightly raised rash

Causes and risk factors

Rat-bite fever develops when bacteria carried by a rodent enter the body. This can happen through broken skin or through the mouth, nose, or eyes.

Possible routes include:

Food- or water-associated infection caused by Streptobacillus moniliformis is sometimes

called Haverhill fever.

People with pet rodents, those who breed or feed rodents, laboratory workers, pest-control workers, and people living where wild rodents are present may have more opportunities for exposure. Children may be exposed while playing with pet rodents or cleaning cages.

A healthy-looking rodent can carry the bacteria. The risk therefore cannot be judged from the animal's appearance alone.

Rat-bite fever does not usually spread from one person to another. The main concern is direct or indirect contact with an infected rodent.

- A rat or other rodent bite
- A scratch that breaks the skin
- Saliva or urine touching broken skin
- Handling rodents, cages, bedding, or waste
- Eating or drinking something contaminated by rodents

Diagnosis

A healthcare professional will ask about your symptoms and possible contact with rats or other rodents. This includes bites, scratches, handling cages or bedding, and possible contamination of food or drink. Mention the exposure even if the wound has healed or you did not notice a bite.

Blood tests can look for signs of infection and check how your organs are working. Samples of blood, fluid from a swollen joint, or tissue from a wound may be sent to a laboratory.

Streptobacillus moniliformis can be difficult to grow in standard laboratory cultures. The laboratory may need special handling or molecular testing, such as polymerase chain reaction, usually called PCR. PCR looks for genetic material from the bacterium.

Spirillum minus does not grow in routine laboratory cultures. Diagnosis may require examination of blood or tissue under a microscope or testing at a specialist laboratory.

Because testing can be difficult, treatment may begin when symptoms and exposure strongly suggest the infection rather than waiting for every result. Other conditions, including different bacterial infections, viral infections, inflammatory joint conditions, and medication reactions, may also need to be considered.

Treatment and management

Rat-bite fever is treated with antibiotics. Penicillin-type antibiotics are commonly used, but the choice depends on the suspected bacterium, illness severity, test results, allergies, pregnancy, and other health factors.

People who are seriously unwell may need antibiotics through a vein in hospital. Treatment may later change to tablets or liquid medicine once symptoms improve. Heart-valve infection, infection in a joint, or another deep infection usually needs a longer and more complex course than uncomplicated rat-bite fever.

Take the antibiotic for the full period prescribed, even if your fever or rash improves early. Contact the prescribing service if you cannot take it because of vomiting or side effects. Do not use leftover antibiotics or antibiotics intended for another person.

Supportive care may include fluids, rest, and suitable medicine for fever or pain. A swollen joint may need a sample taken to check for infection. Occasionally, an infected joint or abscess needs drainage.

A bite wound may also need cleaning, assessment for tissue damage, and a review of tetanus vaccination. Rabies assessment is based on the animal, location, and circumstances of exposure; it is separate from rat-bite fever treatment.

Complications

Most people recover when the infection is identified and treated promptly. Complications are more likely when treatment is delayed or the bacteria spread through the bloodstream.

Possible complications include:

Endocarditis may cause continuing fever, unusual tiredness, breathlessness, or other signs of heart problems. It requires specialist treatment.

These complications are not the usual outcome, but they explain why fever, rash, or joint pain after rodent exposure should be assessed promptly.

- Infection inside a joint, called septic arthritis
- Infection of a heart valve, called endocarditis
- Infection around the brain and spinal cord, called meningitis
- Pneumonia or infection around the lungs
- Abscesses, which are collections of pus

- Inflammation affecting the liver, kidneys, or blood vessels
- Sepsis, a serious whole-body response to infection

Prevention

Rat-bite fever can often be prevented by reducing contact with rodent saliva, urine, and waste. There is no vaccine for it, and not every exposure can be avoided.

Handle pet and laboratory rodents carefully. Wash your hands with soap and water after touching rodents, cages, bedding, food bowls, or waste. Supervise children around rodents and make sure they wash their hands afterward.

Avoid eating, drinking, or touching your face while cleaning cages. Use protective gloves when handling waste or a dead rodent, especially if you have cuts on your hands. Keep cuts covered with a clean, waterproof dressing.

Store food in rodent-resistant containers and clean areas where rodents may contaminate food or preparation surfaces. Professional pest control may be appropriate for an infestation.

If you are bitten or scratched, wash the area promptly with soap and running water. Seek advice if the wound is deep, will not stop bleeding, involves the hand or face, shows signs of infection, or if your tetanus protection may not be current.

Preventive antibiotics are not automatically required after every rodent bite. The decision is based on the wound and exposure circumstances.

Living with it and what to expect

Rat-bite fever is usually an acute infection rather than a lifelong condition. Fever and general illness often improve after effective antibiotics begin, although joint discomfort and tiredness may take longer to settle.

You may need follow-up to confirm that symptoms have resolved and to review laboratory results. Follow-up is particularly important if you had a swollen joint, persistent fever, heart symptoms, or treatment in hospital.

A spreading rash should fade as the infection clears. Seek another assessment if fever returns, a joint becomes more swollen, or symptoms continue after treatment. This may mean the original infection has not fully cleared, a complication is present, or another condition is causing the symptoms.

People who develop endocarditis, septic arthritis, or another organ infection may need weeks

of treatment and specialist follow-up. Recovery can be slower, particularly when a joint or heart valve has been affected.

After uncomplicated infection has been fully treated, ongoing infection is not expected. Having rat-bite fever once does not provide reliable protection against getting it again. Another exposure can lead to another infection.

When to get medical help

Arrange urgent, same-day medical advice if you develop fever, vomiting, a new rash, or significant joint pain after contact with a rat or another rodent. This applies even if there was no known bite or the wound has already healed.

Also seek prompt care if a bite or scratch becomes increasingly painful, red, warm, swollen, or starts draining fluid. Redness spreading away from the wound or fever after a bite needs assessment.

Call emergency services for symptoms that may indicate sepsis or another serious complication, including:

Routine follow-up is appropriate after treatment to review recovery and test results. It becomes urgent if fever returns, symptoms worsen, or new breathing, heart, or neurological symptoms develop.

- Difficulty breathing
- Confusion, fainting, or being difficult to wake
- Severe weakness or rapid worsening
- Blue, grey, or unusually pale skin or lips
- Severe chest pain
- A widespread purple rash that does not fade when pressed

Common questions

Can I get rat-bite fever without being bitten?

Yes. The bacteria can spread through scratches, contact with rodent saliva or urine, or food and drink contaminated by rodents. Some people do not remember any break in the skin.

How soon after a rat bite do symptoms appear?

Symptoms often start within several days, but they can take a few weeks. Infection caused by

Spirillum minus generally has a longer delay than infection caused by Streptobacillus moniliformis .

Do pet rats carry rat-bite fever?

Pet rats can carry the bacteria without looking sick. This does not mean every pet rat is infected or that everyone handling one will become ill. Careful handling, handwashing, and regular cage hygiene reduce exposure.

Is rat-bite fever contagious between people?

Person-to-person spread is not considered a usual route of infection. Most cases are linked to direct rodent contact or contamination from rodents.

Will a rat bite always need antibiotics?

Not every rat bite requires preventive antibiotics, but every significant bite needs careful cleaning and an assessment of the wound, tetanus protection, and exposure circumstances. Fever, rash, vomiting, or joint pain afterward requires prompt medical advice.

Can rat-bite fever come back?

Symptoms can return if the infection was not fully treated, especially with Spirillum minus . A new rodent exposure can also cause a new infection because previous illness does not provide reliable immunity.

Sources

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