

## Leptospirosis (Weil's Disease)

### Description

Leptospirosis is a disease that affects humans and animals caused by spiral-shaped bacteria of the genus *Leptospira*. Infection with leptospire can cause no symptoms at all, a mild flu-like illness, or a more severe illness called Weil's disease, with jaundice and kidney failure.

The reservoir of infection is most commonly in rodents, which cause most human cases, or other wild and domesticated animal species. The infection in humans is contracted through exposure to water contaminated by infected animal urine, through skin abrasions and the mucous membranes of the nose, mouth and eyes.

The onset of symptoms is rapid. Due to its resemblance to other diseases and the necessity for laboratory tests to confirm the diagnosis, the disease is largely underreported and is overlooked in many parts of the world where it is likely to occur.<sup>1</sup>

### Distribution

Leptospirosis occurs worldwide but is primarily a disease of humid regions. It is uncommon but not rare in temperate areas. Seasonal rises in incidence and epidemics occur in wet spring and summer seasons and at harvest time, when the population of rodents is highest. Epidemics also follow natural disasters, such as floods and earthquakes, which drive rats out of sewers<sup>2</sup>

### Causative Agent

There are over 200 known pathogenic serovars (subtypes of Leptospire bacteria), which infect different species of animals. The most common Leptospire in the UK are *Leptospira hardjo*, which is found in cattle, and *Leptospira icterohaemorrhagiae*, which is associated with rats.<sup>3</sup>

### Transmission

Infected animals carry the bacteria in their kidneys. They can excrete leptospire in their urine for some time, and spread infection to other animals or humans coming into direct or indirect contact with the urine. Often the infected animal does not become ill. Any exposure to infected animals or water contaminated with their urine can transfer the infection so any area of fresh water that may have a rat population must be considered a risk.

### Symptoms

Leptospirosis symptoms develop between 7 and 12 days after infection with the bacteria. Most cases will be asymptomatic or will settle after a week or two.

Initial symptoms include:

- Fever
- Headache
- Chills
- Muscle aches
- Vomiting
- Conjunctivitis
- Photophobia
- Rash

In most instances, the symptoms subside uneventfully in 4-7 days. However, in a minority of cases, the illness enters a second, more serious phase, characterized by worsening headaches, fevers, chills, and muscle pains. A rash is often observed. Complications may include meningitis, kidney failure, liver failure, and bleeding into the lungs or gastrointestinal tract. The second phase may be separated from the first by several days, during which time the patient appears relatively well.

Many of these symptoms can be mistaken for other diseases therefore confirmation of diagnosis can only be attained through lab testing of a blood or urine sample.

<sup>1</sup> The International Leptospirosis Society [http://www.leptonet.net/html/who-ils\\_guidelines.asp](http://www.leptonet.net/html/who-ils_guidelines.asp)

<sup>2</sup> World Health Organization <http://www.who.int/csr/disease/leptospirosis/index2.html>

## Treatment

Leptospirosis is treated with antibiotics such as penicillin or doxycycline, which should be given early in the course of the disease. Intravenous antibiotics may be needed for people with more severe symptoms.<sup>4</sup>

## Control and Prevention

There is no human vaccine available in the UK that is effective against leptospirosis. For people who may be at high risk for short periods, especially through their occupation, taking doxycycline (200mg weekly) may be effective. If contact with freshwater or rats is unavoidable then the simple precautions can be taken:

- Cover cuts, scratches or sores with a waterproof plaster and thoroughly clean cuts or abrasions received during activities
- Wear appropriate protective clothing, gloves or protective footwear
- Wash or shower promptly after water sports, especially if you fall in
- Avoid capsize drill or rolling in stagnant or slow moving water
- Wear thick gloves when handling rats
- Wash hands after handling any animal and before eating<sup>5</sup>

The risk of acquiring leptospirosis can be greatly reduced by not swimming or wading in water that might be contaminated with animal urine and taking precautions to control and not to encourage rats.

Given this, there are several activities that present a high risk:

- Swimming and scuba diving
- Kayaking and canoeing
- Sailing, windsurfing, fishing and waterskiing
- Caving and underground exploration
- Cleaning and jetting operations (due to the high vapour generation)
- Animal handling, control and management (domestic, wild and farmed)

There are many lower-risk activities (such as hiking, horse-riding, etc) where you may pass through contaminated areas but are unlikely to come into direct contact with rodents or water, plus several specific activities where risks are high but only in the event of an accident (such as working at height over water).

### High risk areas

- Small slow-flowing rivers, ditches and pools
- Underground caves, sewers and drains
- Marshes and permanently wet soil
- Fountains, water features, ponds and moats without disinfection equipment

### Low risk areas

- Fast-flowing rivers
- Tidal estuaries (saltwater exposure)
- Very large lakes and rivers
- Hard surfaces which regularly dry out
- Polluted and contaminated water where heavy metals are present and the pH is non-neutral
- Water that is regularly above 70°C<sup>6</sup>

<sup>4</sup> US Center for Disease Control <http://www2.ncid.cdc.gov/travel/yb/utills/ybGet.asp?section=dis&obj=lepto.htm>

<sup>5</sup> UK Health Protection Agency [http://www.hpa.org.uk/infections/topics\\_az/zoonoses/leptospirosis/aen\\_info.htm](http://www.hpa.org.uk/infections/topics_az/zoonoses/leptospirosis/aen_info.htm)