

# Leishmaniasis

A disease caused by protozoan parasites of the genus *Leishmania* which is found in localized areas throughout tropical and subtropical regions. The disease is transmitted by small (2 mm) biting flies known as sand flies.

Several species of *Leishmania* can infect humans. In most cases, humans are incidental hosts of *Leishmania* and other mammals are the reservoir hosts. The various *Leishmania* species exhibit different geographical ranges. In general, each species of *Leishmania* will cause a particular type of disease manifestation, which can range from a self-healing skin lesion, to a disfiguring mucocutaneous lesion, to a visceral disease.

## Disease Pathogenesis

The infection is acquired when a person is bitten by an infected sand fly. The parasite is taken up by macrophages and then replicates within the host macrophage. Parasites are released from the host macrophage and are taken up by other macrophages and continue this replication cycle. This usually results in an ulcerated skin lesion at the site of the original sand fly bite. With time the host immune response will eliminate the parasites and the lesion will heal, perhaps leaving a scar.

Occasionally the infected macrophages will spread from the original site and cause secondary skin lesions or invade mucosal tissue—especially around the mouth and nose. The invasion of the mucosa results in a disfiguring disease in which the cartilage of the nose and surrounding tissue is destroyed. This mucocutaneous form of the disease is difficult to treat and does not readily cure itself.

In some *Leishmania* species the infected macrophages do not remain in the skin, but migrate to the bone marrow, liver and spleen and cause a systemic infection known as visceral leishmaniasis. Symptoms of visceral leishmaniasis include fever and enlarged liver, spleen and lymph nodes. As the disease progresses patients often exhibit a wasting syndrome, characterized by weight loss and failure to thrive, despite good appetite. Visceral leishmaniasis is usually fatal if not treated.

## KEY FACTS

### Description

A chronic disease characterized by either skin lesions or a systemic infection.

### Causes

Protozoa of the genus *Leishmania*.

### Risk Factors

Being bitten by infected sand flies.

### Symptoms

The cutaneous disease is characterized by chronic skin lesions that are slow to heal. The visceral disease (i.e., systemic infection) is characterized by a wasting syndrome.

### Diagnosis

Detecting the parasite in scrapings from skin lesions or in bone marrow aspirates from systemic infections. Immunological tests are also available.

### Treatment

Pentavalent antimonials are usually the first line of treatment.

### Epidemiology

An estimated 350 million people in 88 countries are at risk of infection. Approximately 12 million people are infected with an estimated 1.5-2 million new clinical cases per year.

## **Transmission Dynamics**

The transmission of *Leishmania* is highly dependent on the local conditions and in many cases it is not completely understood. Generally leishmaniasis is a zoonotic infection involving animal reservoirs. However, in some localities there is anthroponotic transmission involving a human-fly-human transmission cycle. In south and central America transmission is usually associated with low land forests and is associated with occupational or recreational activities. Peridomiciliary transmission tends to predominate in the rest of the world. Transmission in urban areas often involves a dog reservoir or is anthroponotic, whereas in rural areas rodents are often the reservoir. Control measures need to take into account the local transmission dynamics. Personal protection activities should include measures that avoid sand fly bites such as protective clothing, insect repellants, bed nets, and insecticides.

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