

LEISHMANIASIS: NEEDS TO IMPROVE DIAGNOSIS TECHNIQUES FOR SAVING HUMAN LIFE

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ABSTRACT

Encompassing a complex group of disorders, leishmaniasis is caused by unicellular eukaryotic obligate intracellular protozoa of the genus Leishmania and primarily affects the host's reticuloendothelial system. Leishmania species produce widely varying clinical syndromes ranging from self-healing cutaneous ulcers to fatal visceral disease. These syndromes fall into three broad categories visceral leishmaniasis, cutaneous leishmaniasis and mucosal leishmaniasis. This Paper attempts to study about the lifecycle, types, causes, diagnosis, complication, treatment and prevention of spreading Leishmaniasis.

Key Words: *Cutaneous leishmaniasis, Mucocutaneous leishmaniasis, Visceral leishmaniasis*

INTRODUCTION

Leishmaniasis is a parasitic disease caused by the *Leishmania* parasite. This parasite typically lives in infected sand flies. You can contract leishmaniasis from a bite of an infected sand fly. Leishmaniasis is transmitted by the bite of infected female phlebotomine sand flies. The sand flies inject the infective stage (i.e., promastigotes) from their proboscis during blood meals.

Promastigotes that reach the puncture wound are phagocytized by macrophages and other types of mononuclear phagocytic cells. Promastigotes transform in these cells into the tissue stage of the parasite (i.e., amastigotes) which multiply by simple division and proceed to infect other mononuclear phagocytic cells. Parasite, host, and other factors affect whether the infection becomes symptomatic and whether cutaneous or visceral leishmaniasis results. Sand flies become infected by ingesting infected cells during blood meals. In sand flies, amastigotes transform into

promastigotes, develop in the gut in the hindgut for leishmanial organisms in the *Viannia* subgenus; in the midgut for organisms in the *Leishmania* subgenus), and migrate to the proboscis.

TYPES OF LEISHMANIASIS

Leishmaniasis comes in three forms: cutaneous, visceral, and mucocutaneous. Different species of the *Leishmania* parasite are associated with each form. Experts believe that there are about 20 *Leishmania* species that can transmit the disease to humans.

Cutaneous leishmaniasis

Cutaneous leishmaniasis causes ulcers on your skin. It's the most common form of leishmaniasis. Treatment may not always be necessary depending on the person, but it can speed healing and prevent complications.

Mucocutaneous leishmaniasis

A rare form of the disease, mucocutaneous leishmaniasis is caused by the cutaneous form of the parasite and can occur several months after skin ulcers heal. With this type of leishmaniasis, the parasites spread to your nose, throat, and mouth. This can lead to partial or complete destruction of the mucous membranes in those areas. Although mucocutaneous leishmaniasis is usually considered a subset of cutaneous leishmaniasis, it's more serious. It doesn't heal on its own and always requires treatment.

Visceral leishmaniasis

Visceral leishmaniasis is sometimes known as systemic leishmaniasis or kala azar. It usually occurs two to eight months after being bitten by a sand fly. It damages internal organs, such as your spleen and liver. It also affects your bone marrow, as well as your immune system through damage to these organs.

The condition is almost always fatal if it's not treated.

CAUSES OF LEISHMANIASIS

Leishmaniasis is due to protozoan parasites from the *Leishmania* species. You get leishmaniasis from being bitten by an infected sand fly. The parasite lives and multiplies inside the female sand fly. This insect is most active in humid environments during the warmer months and at night, from dusk to dawn. Domestic animals, such as dogs, can serve as reservoirs for the parasite. Transmission may occur from animal to sand fly to human.

Humans can also transmit the parasite between each other through a blood transfusion or shared needles. In some parts of the world, transmission may also occur from human to sand fly to human.

Other infections

People who have weakened immune systems are at increased risk of this condition.

HIV can influence the transmission of leishmaniasis and increase the risk of visceral leishmaniasis. HIV and leishmaniasis affect similar cells of the immune system.

People infected with HIV are also often infected with leishmaniasis. In areas of Ethiopia, it's estimated that as many as 35 percent Trusted Source of people with leishmaniasis have HIV too.

SYMPTOMS OF LEISHMANIASIS

People can carry some species of *Leishmania* for long periods without becoming ill. Symptoms depend on the form of the disease.

Cutaneous leishmaniasis

The main symptom of this condition is painless skin ulcers. Cutaneous symptoms may appear a few weeks after being bitten by an infected sand fly. However, sometimes symptoms won't appear for months or years.

Mucocutaneous leishmaniasis

In people with the mucocutaneous form of the disease, symptoms usually appear one to five years after the skin lesions. These are primarily ulcers in their mouth and nose or on their lips.

Other symptoms may include:

- runny or stuffy nose
- nosebleeds
- difficulty breathing

Visceral leishmaniasis

Symptoms often don't appear for months after the bite with this type of leishmaniasis. Most cases are apparent two to six months after the infection occurred. Common signs and symptoms include:

- weight loss
- weakness
- fever that lasts for weeks or months
- enlarged spleen
- enlarged liver
- decreased production of blood cells
- bleeding
- other infections
- swollen lymph nodes

DIAGNOSIS OF LEISHMANIASIS

It's important to tell your doctor if you lived in or visited a place where leishmaniasis is common. That way your doctor will know to test you for the parasite. If you have leishmaniasis, your doctor will use other tests to determine which species of *Leishmania* is the cause.

Diagnosing cutaneous leishmaniasis

Your doctor may take a small amount of skin for a **biopsy** by scraping one of the ulcers. They'll often look for the DNA, or genetic material, of the parasite. They can use a variety of methods to identify the species of parasite causing the infection.

Diagnosing visceral leishmaniasis

Many times, people don't remember a bite from a sand fly. This can make the condition hard to diagnose.

A history of living or traveling to an area of leishmaniasis is helpful. Your doctor may first perform a physical exam to look for an enlarged spleen or liver. They may then perform a bone marrow biopsy or take a blood sample for examination.

A variety of specialized tests aid with diagnosis. Special chemical stains of bone marrow can help identify immune cells infected with the parasite.

TREATMENTS FOR LEISHMANIASIS

Antiparasitic drugs, such as amphotericin B (Ambisome), treat this condition. Your doctor may recommend other treatments based on the type of leishmaniasis you have.

Cutaneous leishmaniasis

Cutaneous ulcers will often heal without treatment. However, treatment can speed healing, reduce scarring, and decrease risk of further disease. Any skin ulcers that cause disfigurement may require plastic surgery.

Mucocutaneous leishmaniasis

These lesions don't heal naturally. They always require treatment. Liposomal amphotericin B and paromomycin can treat mucocutaneous leishmaniasis.

Visceral leishmaniasis

Visceral disease always requires treatment. Several medications are available. Commonly used medicines include sodium stibogluconate (Pentostam), amphotericin B, paromomycin, and miltefosine (Impavido).

POTENTIAL COMPLICATIONS OF LEISHMANIASIS

Cutaneous leishmaniasis complications may include:

- bleeding
- other infections due to a weakened immune system, which can be life-threatening
- disfigurement

Visceral leishmaniasis is often fatal due to the effects it has on both internal organs and your immune system. If you have HIV or AIDS, you're at higher risk of getting this disease. Having HIV or AIDS can also complicate the course of leishmaniasis, as well as the treatment.

PREVENTION POSSIBILITY OF LEISHMANIASIS

There's no vaccine or prophylactic medication available. The only way to prevent leishmaniasis is to avoid getting bitten by a sand fly.

Follow these steps to help prevent being bitten by a sand fly:

- Wear clothing that covers as much skin as possible. Long pants, long-sleeved shirts tucked into pants, and high socks are recommended.
- Use insect repellent on any exposed skin and on the ends of your pants and sleeves. The most effective insect repellants contain DEET.
- Spray indoor sleeping areas with insecticide.
- Sleep on the higher floors of a building. The insects are poor fliers.
- Avoid the outdoors between dusk and dawn. This is when sand flies are most active.
- Use screens and air conditioning indoors when possible. Using fans might make it more difficult for the insects to fly.
- Use a bed net tucked into your mattress. Sand flies are much smaller than mosquitos, so you need a tightly woven net. Spray the net with insecticide containing pyrethroid if possible.

Buy bed nets, insecticides, and repellents before traveling to high-risk areas.

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