Haemoflagellates

Leishmania

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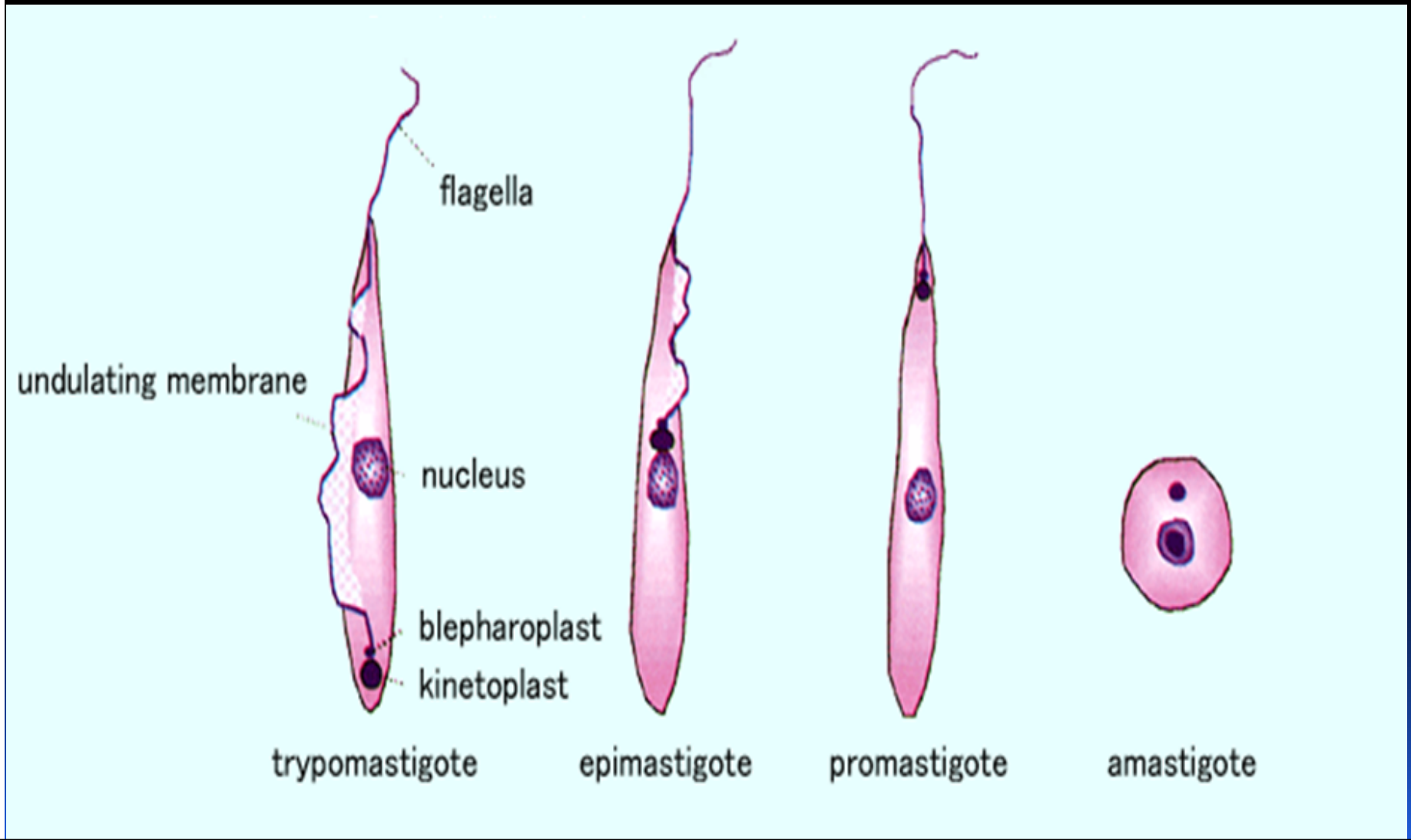
Leishmaniasis

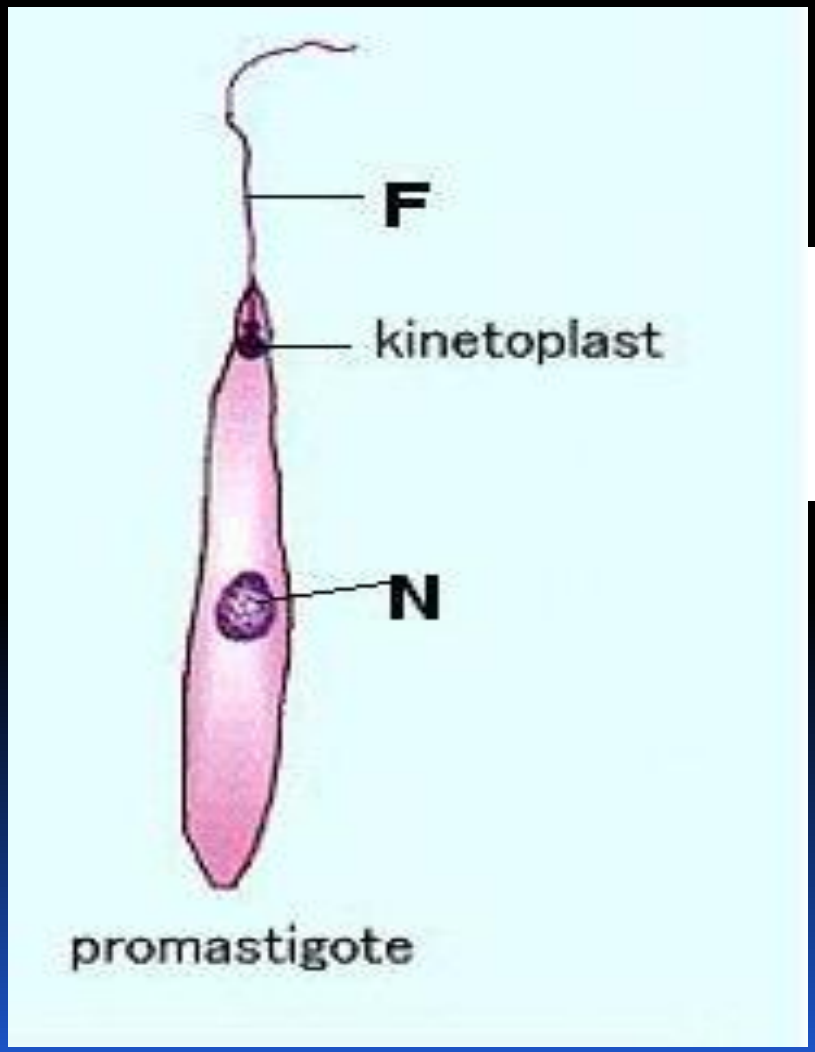
a parasitic disease caused by the *Leishmania* parasite. This parasite typically lives in infected sand flies. You can contract leishmaniasis from a bite of an infected sand fly.

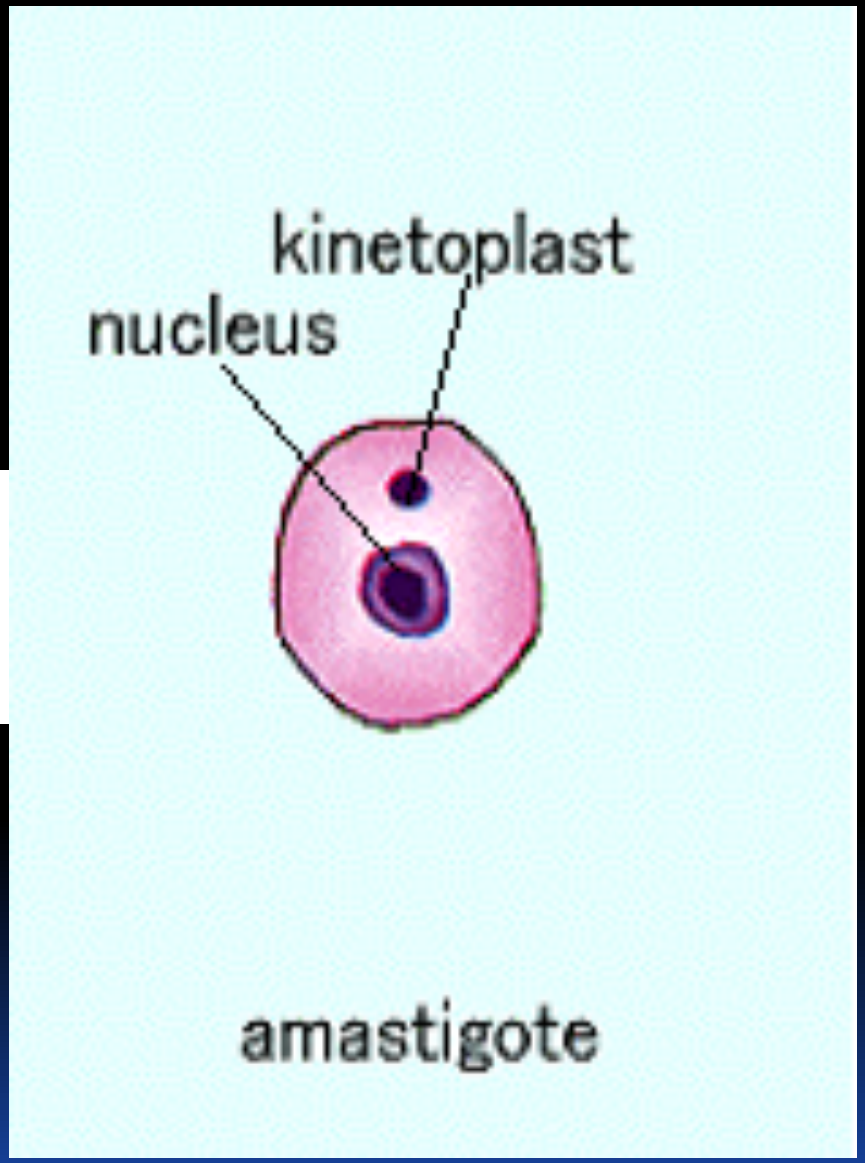
The sand flies that carry the parasite typically reside in tropical and subtropical environments. have occurred in areas of Asia, East Africa, and South America.

Different stages of Haemoflagellates



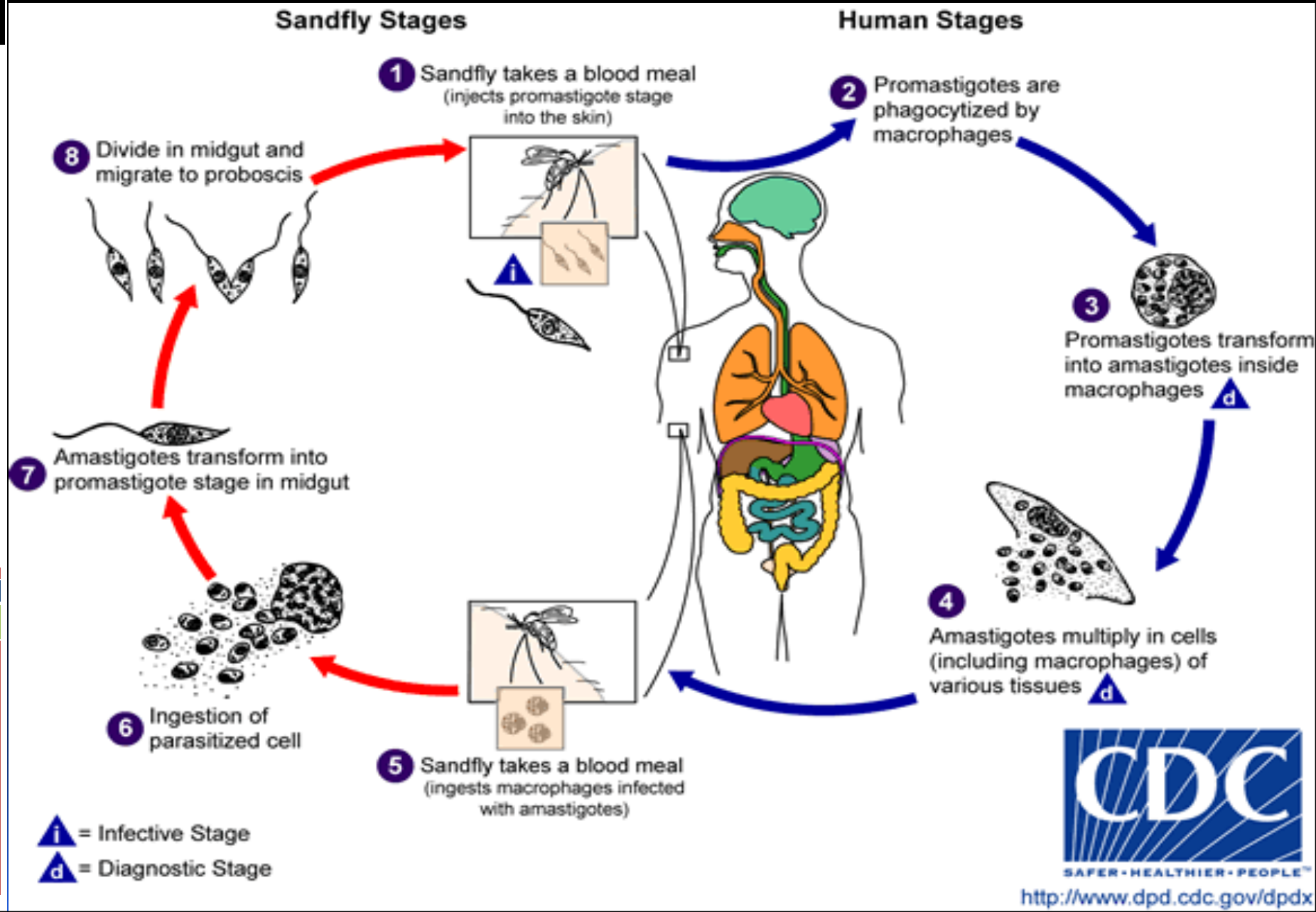
Promastigotes of *Leishmania*





Amastigote of *Leishmania*

The life cycle of *Leishmania*



Leishmania Parasites and Diseases

SPECIES	Disease
*Leishmania tropica** *Leishmania major** *Leishmania aethiopica* *Leishmania mexicana*	Cutaneous leishmaniasis
Leishmania braziliensis	Mucocutaneous leishmaniasis
*Leishmania donovani** *Leishmania infantum** *Leishmania chagasi*	Visceral leishmaniasis

* Endemic in Saudi Arabia

What are the 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.

1. 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.

2. 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.

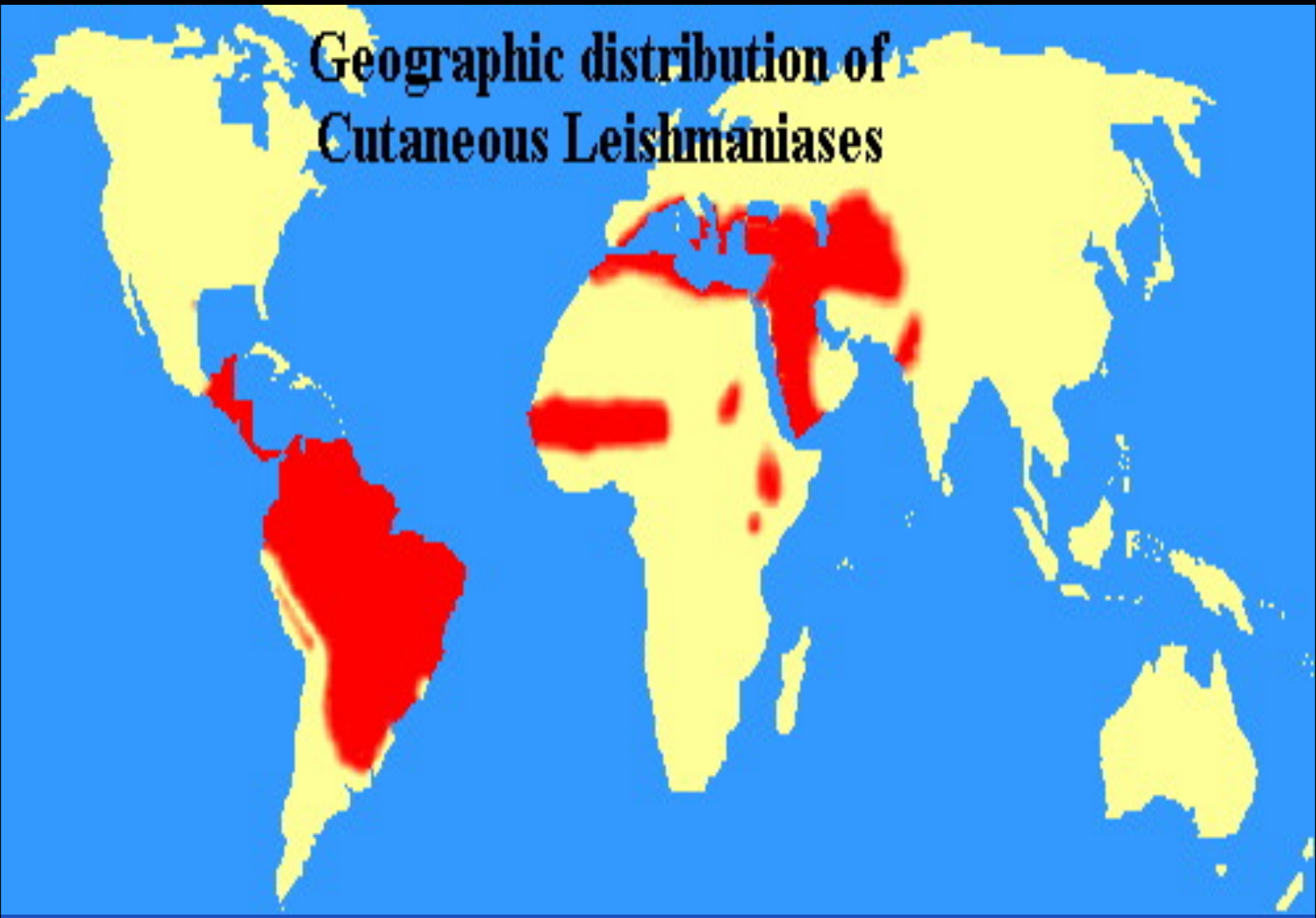
Although mucocutaneous leishmaniasis is usually considered a subset of cutaneous leishmaniasis, it's more serious. It doesn't heal on its own and always requires treatment.

3. Visceral leishmaniasis

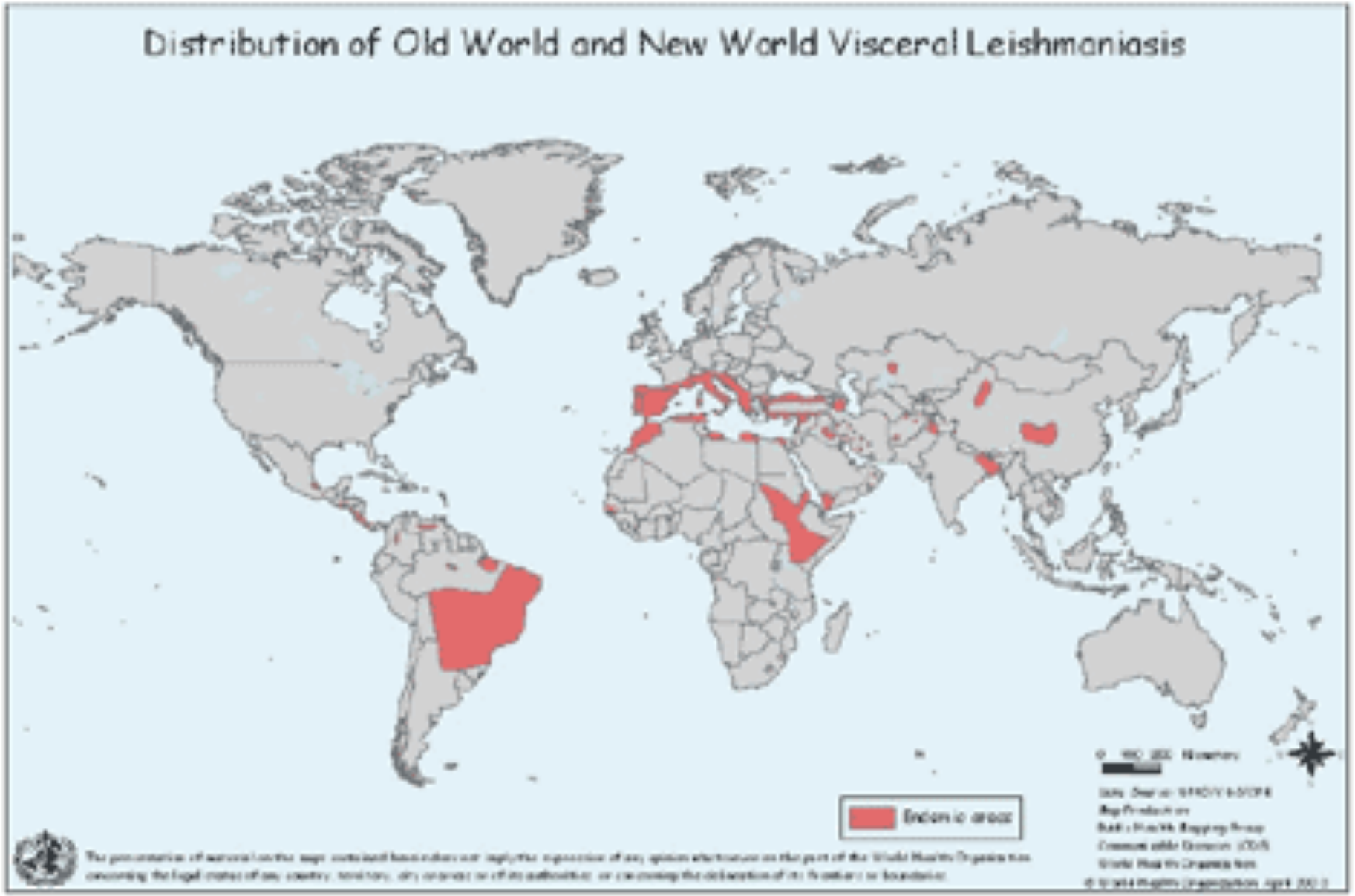
Visceral leishmaniasis is sometimes known as systemic leishmaniasis or kala azar.

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.

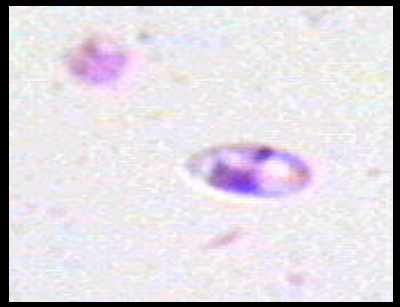

Geographic distribution of
Cutaneous Leishmaniases

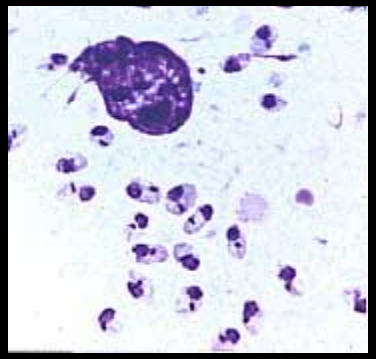
World distribution of Visceral Leishmaniasis



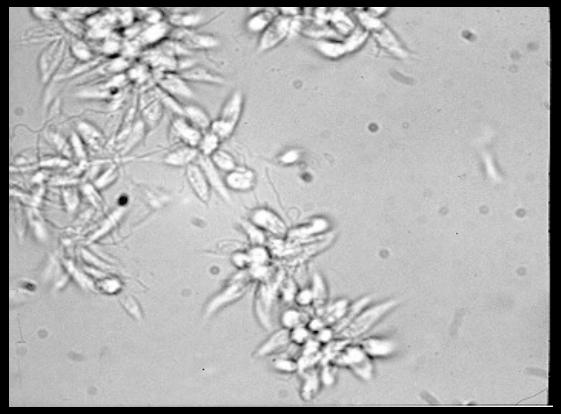
Sand fly

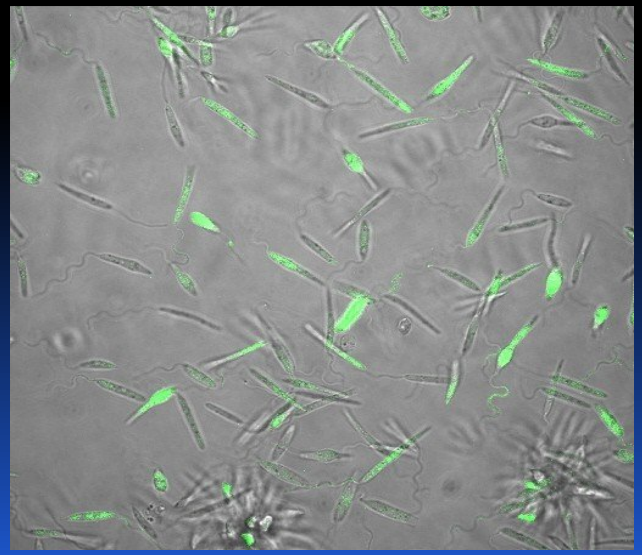
Amastigotes of *Leishmania*



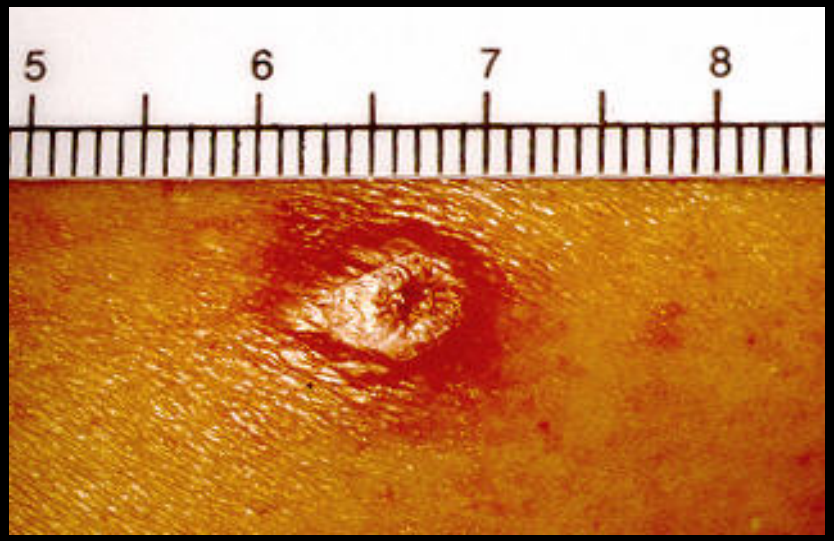


Promastigotes of *Leishmania*





lesion of cutaneous lishmaniasis



Clinical types of cutaneous leishmaniasis

- ***Leishmania major*:**

Zoonotic cutaneous leishmaniasis, wet lesions with severe reaction

- ***Leishmania tropica*:**

Anthroponotic cutaneous leishmaniasis, dry lesions with minimal ulceration

Oriental sore (most common) classical self-limited ulcer

CUTANEOUS LISHMANIASIS THE COMMON TYPE

This starts as a **painless papule** on exposed parts of the body, generally the face.

The lesion ulcerates after a few months producing an ulcer with an indurate margin.

In some cases the ulcer remains dry and heals readily (**dry-type-lesion**).

In some other cases the ulcer may spread with an inflammatory zone around, these known as (**wet-type-lesion**) which heal slowly.

UNCOMMON TYPES OF CUTANEUS LISHMANIASIS

- **Diffuse cutaneous leishmaniasis** (DCL):

Caused by *L. aethiopica*, diffuse nodular non-ulcerating lesions, seen in a part of Africa, people with low immunity to *Leishmania* antigens. Diffuse cutaneous **(DCL)**, and consists of nodules and a thickening of the skin, generally without any ulceration, it needs numerous parasite.

- **Leishmaniasis recidiva** (lupoid leishmaniasis):

Severe immunological reaction to *leishmania* antigen leading to persistent dry skin lesions, few parasites.

Diffuse cutaneous leishmaniasis (DCL)

Leishmaniasis recidiva

Mucocutaneous leishmaniasis

The lesion starts as a pustular swelling in the mouth or on the nostrils. The lesion may become ulcerative after many months and then extend into the naso- pharyngeal mucous membrane.

Secondary infection is very common with destruction of the nasal cartilage and the facial bone.

cutaneous & muco-cutaneous leishmaniasis

Diagnosis

The parasite can be isolated from the margin of the ulcer.

A diagnostic skin test, known as Leishmanin test

(Montenego Test), is useful.

Smear: Giemsa stain – microscopy for LD bodies (Leishman-Donovan bodies, amastigotes).

- Skin biopsy: microscopy for LD bodies or culture in **NNN medium** for promastigotes.

NNN medium

Visceral leishmaniasis

- There are geographical variations.
- The disease is called **kala-azar**
- *Leishmania infantum* mainly affect children
- *Leishmania donovani* mainly affects adults
- The incubation period is usually 4-10 months.
- The early symptoms are generally low grade fever with malaise and sweating.
- In later stages, the fever becomes intermittent and their can be liver enlargement or spleen enlargement or hepatosplenomegally because of the hyperplasia of the lymphoid –macrophage system.

Presentation

- Fever
- Splenomegaly, hepatomegaly, hepatosplenomegaly
- Weight loss
- Anaemia
- Epistaxis
- Cough
- Diarrhoea

Untreated disease can be fatal

After recovery it might produce a condition called post kala-azar dermal leishmaniasis (PKDL)

Fever 2 times a day due to kala-azar

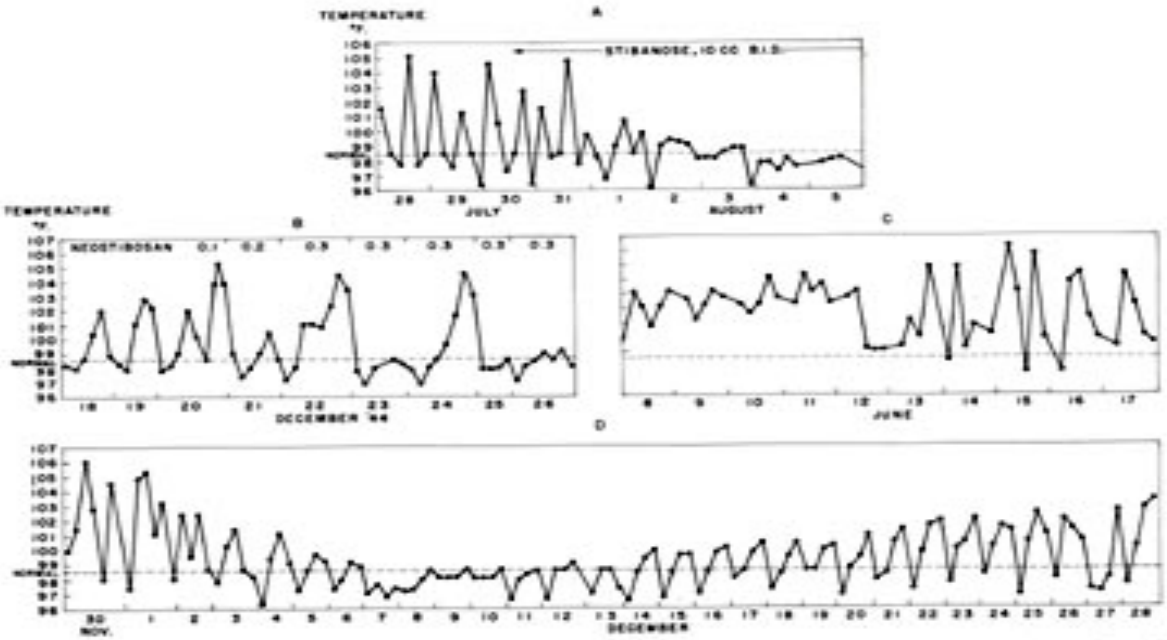


FIGURE 1.—Types of fever in untreated kala-azar and response to specific therapy. A. Daily intermittent fever before treatment. Note double daily peaks. This type of fever was present in this patient for almost 3 months before treatment. Note prompt control of fever after institution of specific therapy (200 cc. stibanose). No relapse occurred during 6 months' observation. B. Note control of fever in this patient within 6 days after institution of specific treatment (Neostibosan, 5.0 gm.). Before treatment, two rises in temperature (101°–105° F.) occurred daily for 4 months. The tertian periodicity that occurred during treatment may also occur in untreated patients and may simulate the form of malaria caused by *Plasmodium vivax*. C. Period of sustained fever simulating typhoid. Note characteristic double peaks later. D. Spontaneous remission and exacerbation of fever without treatment simulating undulant fever.

Hepatosplenomegaly in visceral leishmaniasis

Visceral leishmaniasis

Diagnosis

(1) Parasitological diagnosis:

Bone marrow aspirate

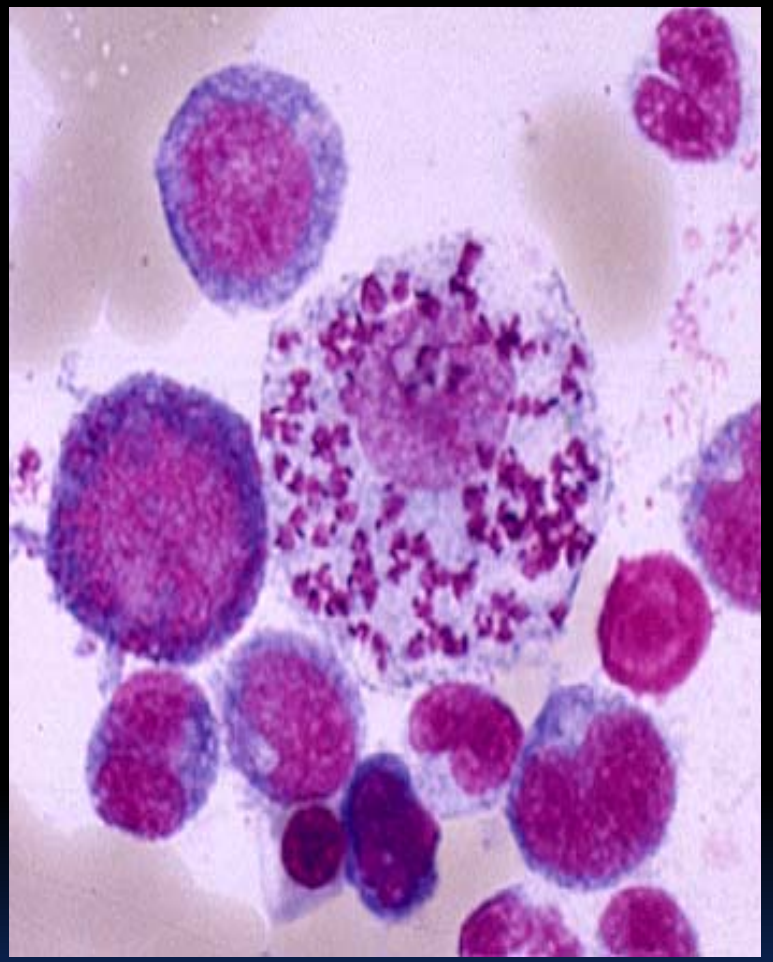
Splenic aspirate

Lymph node

Tissue biopsy

1. microscopy (LD bodies)
2. culture in NNN medium (promastigotes)

Bone marrow aspiration

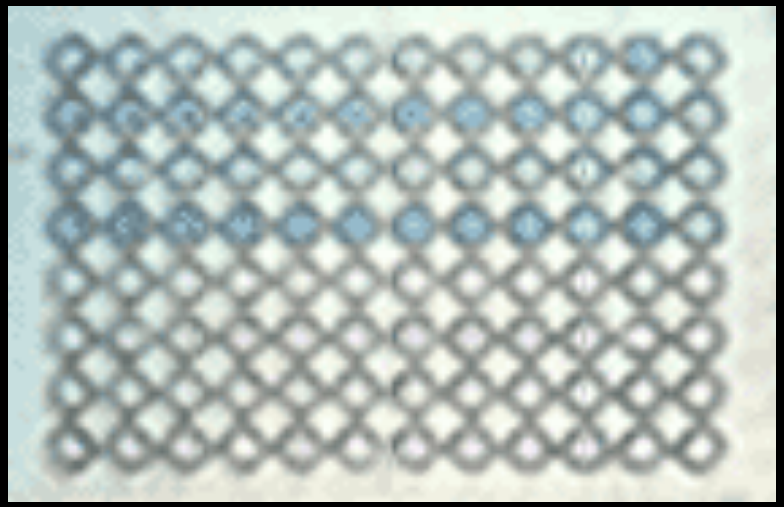


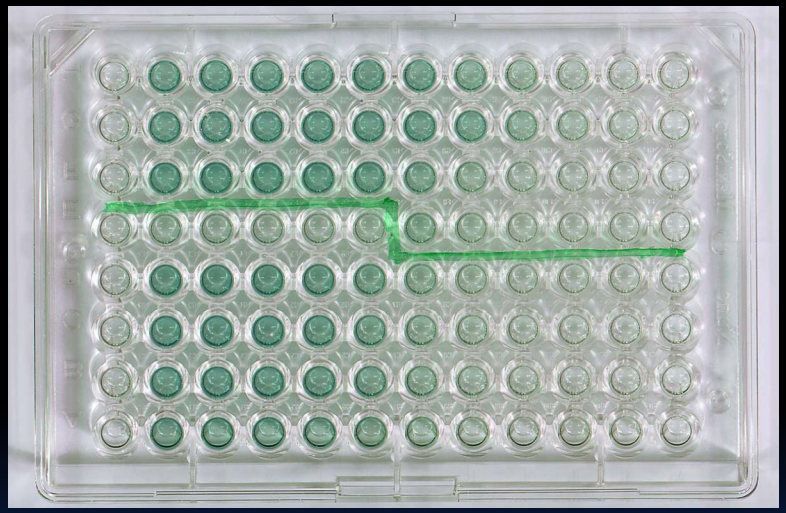
Bone marrow amastigotes

(2) Immunological Diagnosis:

- Specific serologic tests: Direct Agglutination Test (DAT), ELISA, IFAT
- Skin test (leishmanin test) for survey of populations and follow-up after treatment.

DAT test





ELISA test

Treatment

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).