WITH THE NAME OF ALLAH

THE MOST GRACIOUS AND THE MOST MERCIFUL

BLOOD & TISSUE FLAGELLATES

1. LEISHMANIA SPP.

2. TRYPANOSOMES

LEISHMANIASIS

A. Old World Leishmaniasis

B. New World Leishmaniasis

A. Old World Leishmaniasis

Vector : Female Sandfly of genus Phlebotomus

- L. donovani,
- L. tropica,
- L. infantum,
- L. major
- L. aethiopica

B. New World Leishmaniasis

Vector : Sandflies of genus Lutzomyia & Psychodopygus

- L. Peruviana,
- L. Chagasi,
- L. Mexicana Complex
- L. Braziliensis Complex

PREVALENCE

Leishmaniasis is mainly a zoonotic disease,

but human-vector-human transmission is also found.

Endemic in India, Middle East, China, Turkey, Sudan,

Kenya, Somalia, Ethiopia, Morocco and Tunisia.

PREVALENCE

According to W.H.O. Latest estimates

- 350 million people at risk for leishmaniasis,
- 12 million currently infected.
- 1.5 million cases of cutaneous leishmaniasis
- & 0.5 million cases of Kala-azar occur yearly in 80 countries.

MORPHOLOGY

Two morphological forms:

- Amastigote
- Promastigote.

MORPHOLOGY

Morphologically, they are similar to those of L. donovani

Two forms : i.e. Amastigote & Promastigote.

- The Amastigote form occurs in man.

- Promastigote occurs in sandfly & in laboratory cultures.

MORPHOLOGY

a. AMASTIGOTE

The amastigotes reside in the reticuloendothelial system i.e. (Macrophages, Monocytes, Neutrophils).

Round or oval body

Non-motile (without flagellum)

Measuring 2- 4µm in length.

Nucleus is round or oval,

less than 1µm in diameter.

It is situated along the cell wall.

MORPHOLOGY (Continued)

a. AMASTIGOTE

Kinetoplast consists of parabasal body and blepharoplast.

Axoneme arises from the Blepharoplast representing the intracellular portion of the flagellum.

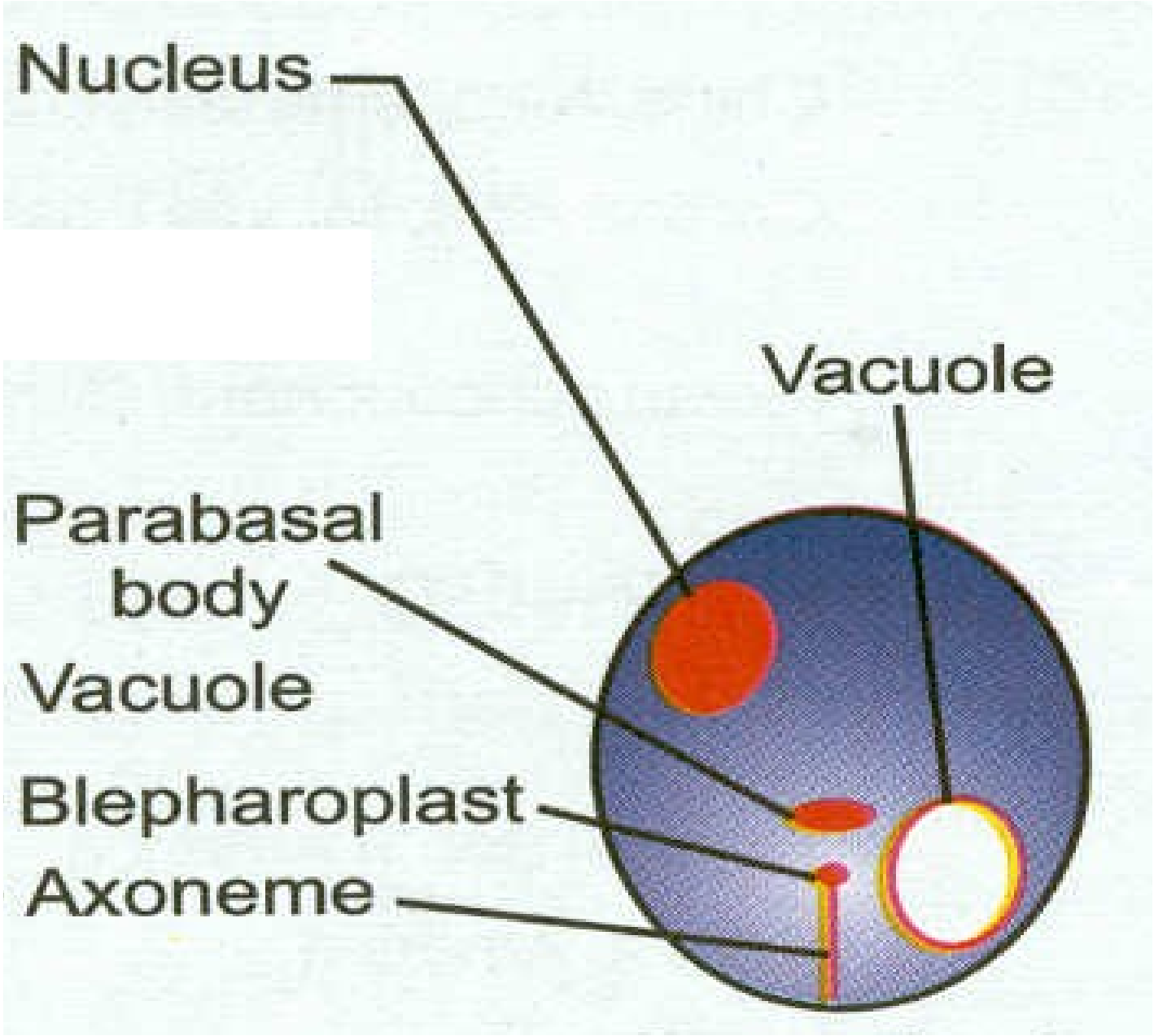
Vacuole is a clear unstained space lying alongside the axoneme.

MORPHOLOGY

Miroscopically,
in slides stained with Giemsa or Wright stain,

- Cytoplasm appears pale blue,
- The inclusion bodies are red
- Nucleus is red,
- Kinetoplast is bright red.

AMASTIGOTE


Nucleus
Vacuole
Parabasal body
Vacuole
Blepharoplast
Axoneme

PROMASTIGOTE

Found in the digestive tract of sandfly & in the culture media.

Elongated, motile, extracellular forms of the parasite.

Mature promastigotes measure 15-25µm by 1.5-3.5µm.

Nucleus is situated centrally.

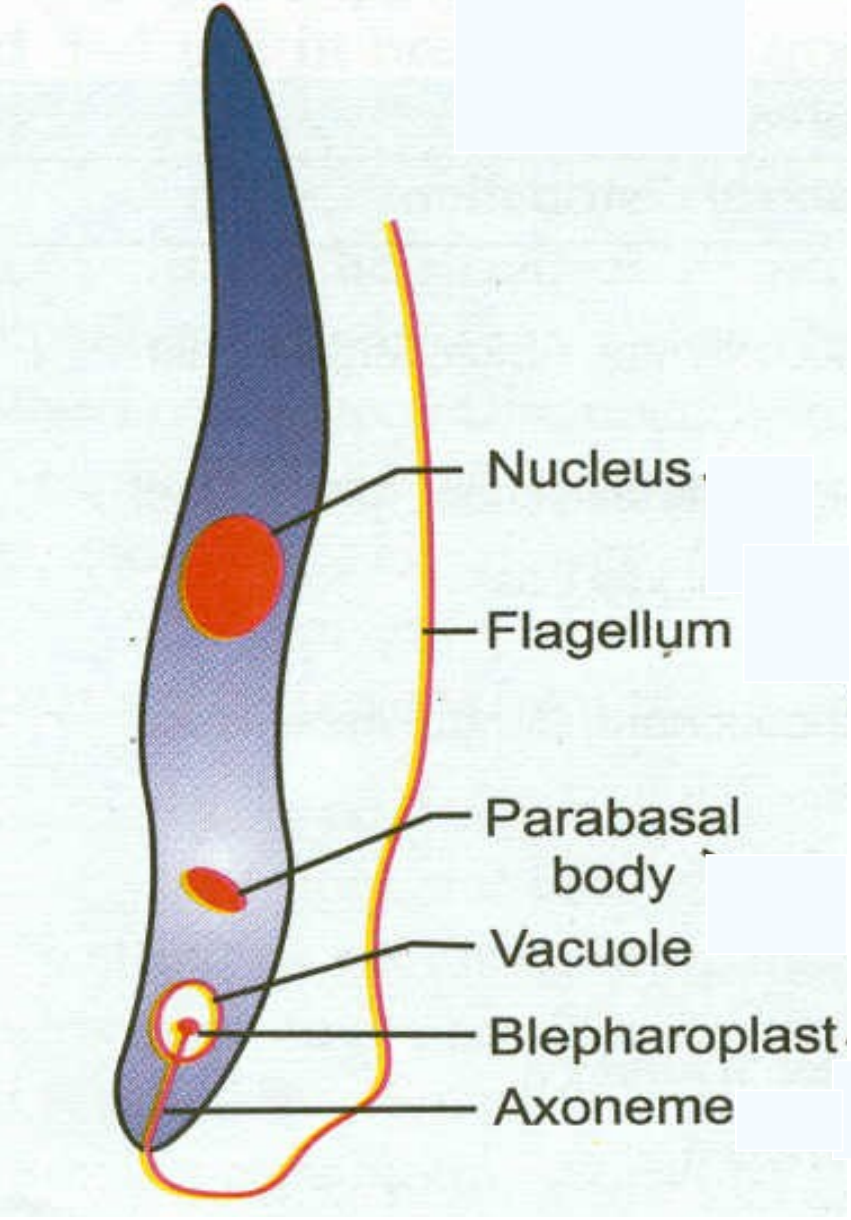
PROMASTIGOTE

Kinetoplast lies near the anterior end.

Vacuole In front of the kinetoplast lies a pale staining vacuole.

Axoneme arises from the **blepharoplast** extending forward as a free flagellum.

Flagellum as long as the parasite body or longer.


Nucleus
Flagellum
Parabasal body
Vacuole
Blepharoplast
Axoneme

Leishmania tropica

Cultivation

- NNN medium (Novy, McNeal, Nicolle)
- Hockmeyer's medium.

LIFE CYCLE

Two hosts

The vertebrate host , man

The invertebrate host, sandfly (P. sergentii).

Life cycle is similar to that of L. donovani.

The only difference is that, in man,

amastigote form of L. tropica resides in SKIN ,

Inside CLASMATOCYTES (reticuloendothelial cells of the skin)

causing disease of skin

Why skin ??

Temperature,

L. tropica more sensitive to temp.

- L. tropica is Dermatotropic (Thermophobic)
- L. donovani is Viscerotropic (Thermophillic)

Incubation Period:

- Varies, few weeks to 6 months.
- Sometimes 1-2 years.


1


2

Synonyms :

- Cutaneous Leishmaniasis
- Urban Anthroponotic Cutaneous Leishmaniasis
- Oriental Sore
- Dehli Boil

PATHOGENESIS

Direct inoculation of promastigotes through the bite of sandfly.

Or

by crushing the infected sand fly into the punctured wound caused by the bite

Phagocytosis by Clasmatocytes (reticuloendothelial cells of the skin)

Transformed into amastigotes.

Development of Cutaneous Lesion Leishmanioma

A chronic infective granuloma with fibrosis.

Pathogenesis

Initially, the lesion is due to

Proliferation of reticuloendothelial cells of skin

containing a large number of amastigotes.

Round cell infiltration (lymphocytes & plasma cells)

Marked reduction in the number of parasites

Development of a delayed hypersensitivity skin reaction (Leishmanin reaction).

Pathogenesis

- The lesion begins as a raised papule about 2.5 cm in diameter.
- Ulcerates in majority of cases,

The ulcer has

- Clean-cut margin

with a

- Raised indurated edge,
- Surrounded by red areola.
- Dry less exudative more swollen & less necrotic (contrary to L. major)
- Having a thick crust

Pathogenicity

Distribution of Lesions:

Exposed parts of the body,

particularly on the face & extremities.

Number of sores is one / two.

DIFFERENTIAL DIAGNOSIS

- Leprosy
- Rodent Ulcer

Pathogenesis

- Enlargement of the draining lymph nodes only.
- No systemic manifestations.
- Parasite is found along the red indurated margin and not on the floor of the ulcer.
- The ulcer heals spontaneously, in about 6 months,
- Leaving a depressed scar and a strong immunity.

Pathogenicity

(Continued)

Immunity

- Marked cell-mediated immunity
- Weak antibody response,

  (although specific antibodies can be detected).
- A strong delayed type of hypersensitivity response to

  LEISHMANIN , both in active and cured cases.

Extensive lesions of Leishmaniasis over the nose may be disfiguring and cosmetically unacceptable sometimes leading to scarring and necrosis.

Dr Sheraz Jamal Khan, District Medical Specialist, DHQ Hospital, Timergera

Shiraz E Medical
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LABORATORY DIAGNOSIS

SMEAR FROM THE LESION

Microscopic examination of material obtained by

puncture of the indurated edge of the sore NOT from the base

by injecting a little volume of sterile physiological saline into indurated margin of the ulcer & then aspirating it.

Giemsa or Wright stain.

Large numbers of Amastigotes inside the macrophages.

LABORATORY DIAGNOSIS

SMEAR FROM THE LESION

Scraping the floor of the ulcer are always negative

because the infected macrophages are destroyed

by secondary bacterial infection.

Laboratory Diagnosis

2. BIOPSY

If smears are negative,

biopsy from the margin of the ulcer provides specific proof of infection.

3. CULTURE

Cultivation of Promastigotes is achieved by culture in NNN medium or Hockmeyer's medium.

The specimen for culture is obtained by injecting a little volume of sterile physiological saline in the indurated margin of the ulcer and then aspirating it.

A few drops of the aspirate are then inoculated into culture medium.

Laboratory Diagnosis

4. MONTENEGRO / LEISHMANIN TEST

0.2 ml of a crude suspension of killed Promastigotes of L. tropica (containing 6-10 Million promastigotes per ml of 0.5% phenol in saline)

is injected intradermally and read after 48-72 hours.

Leishmanin Test is strongly positive in Oriental sore,

showing a marked delayed type of hypersensitivity response.

TREATMENT OF OLD WORLD LEISHMANIASIS

Pentavalent Antimonials:

Sodium stibogluconate

Meglumine antimoniate

Aromatic Diamidines:

Pentamidine

OTHERS:

Monomycin

Paromomycin

Aminosidine

Amphotericin B

Allpurinol

PROPHYLAXIS

No vaccine available.

Only Preventive Measures.

PROPHYLAXIS

Preventive Measures.

- Active case detection and treatment.
- Elimination of sandflies by spraying of insecticides.
- Insect repellents such as dimethyl-phthalate.
- Use of fine mesh bed nets (45 holes in a square inch)
- Insecticide-impregnated bed-nets & curtains.

PROPHYLAXIS

Preventive Measures.

- Sleeping on the roof or second floor (phlebotomus is nocturnal and can't fly high above ground level).
- Destruction of desert rodents (natural reservoirs).
- Elimination of dogs, (reservoir hosts),
- Protection of skin lesions from insects with gauze bandage.

THANK YOU