* بسم الله الرحمن الرحيم
* Visceral leishmaniasis
* Objectives
* Discuss
* Epidemiology , etiology, lifecycle, transmission
* Pathogenesis
* Clinical features
* Lab diagnosis
* and treatment
* of visceral leishmaniasis
* *Leishmania* species
* Kingdom protozoa
* Phylum sarcomastigophora
* Subphylum mastigophora (the flagellates)
* Hemoflagellate
* Leishmania classification
* Infection in humans is caused by ~20 *Leishmania* species (*Leishmania* and *Viannia* subgenera)
* Infection caused by leishmanias is called lesihmaniasis
* Clinical classification
* Leishmania species are classified into three clinical groups based on site of infection
* Leishmania that cause infection on the skin called cutaneous leishmaniasis
* *L. tropica*
* *L. major*
* *L. aethiopica*
* *L. mexicana*
* Leishmania species that cause infection of both skin and mucous membrane(mucous membranes of the nose, mouth and throat cavities)
* *L. braziliensis*
* Leishmania that causes infection of the deep visecera
* *L. donovani*
* *L infantum*
* Geographic classification
* Old world leishmaniasis is caused by
* *L. tropica*
* *L. major*
* *L. aethiopica*
* *L. donovani*
* New world leishmniasis is caused by
* *L. braziliensis*
* *L. mexicana*
* History
* The parasite was named in 1903 after the Scottish pathologist William Boog Leishman who observed oval bodies in 1901, while examining pathologic specimens of a spleen from a patient who had died of visceral leishmaniasis.
* Epidemiology
* *Leishmania* currently affects 12 million people in 98 countries. There are ~ 2 million new cases each year
* Transmission
* Transmitted to humans by the bite of ~30 species of sandflies [*Phlebotomus* (Old World) and *Lutzomyia* (New World)]
* The sand fly injects the infective form ‘promastigote’ in humans
* Morphology
* *Leishmania* exist in two forms:
* the Amastigote,
* the intracellular form(cells of reticuloendothelial system) in the vertebrate host.The amastigote, literally means“without a flagellum,”(although not totally devoid of it) It is rounded, non-motile form and divides by binary fission . The amastigote is also called the Leishman-Donovan (LD) body.
* the Promastigote
* The extracellular form in the sandfly. The promastigote, literally the body form with “an anterior flagellum” ; it is motile, and grows by longitudinal binary Promastigotes can be grown in culture.
* Life cycle
* Pathogenesis
* The pathogenesis involves intracellular survival within the macrophage(safe from the immune response) and formation of a granulomatous reaction
* Macropahges containing parasite proliferate in reticuloendothelial organs(liver, spleen, bonemarrow and lymphnodes) resulting in their enlargement
* Proliferation of parasite containing macrophages in bonemarrow kill normal hematopoitic cells
* Visceral leishmaniasis
* Leishmania donovani
* also known as **kala-azar**, **black fever**, and **Dumdum fever**
* The clinical features include
* Prolonged fever;weight loss
* Parasitic invasion of spleen and liver results in Hepatosplenomegaly (with spleen sometimes massively enlarged);
* Lymph nodes enlargement
* Parasitic invasion of bone marrow results in encroachment of normal hematopoitic cells resulting in pancytopenia ;
* Anemia(fatigue);
* leukopenia (increased risk of infections);
* thrombocytopenia (bleeding)
* Skin blackening
* Post kala-azar dermal leishmaniasis
* Some time after successful treatment—a secondary form of the disease may set in, called post kala-azar dermal leishmaniasis, or PKDL. This condition manifests first as small, measle-like skin lesions on the face, which gradually increase in size and spread over the body
* Lab diagnosis
* Microscopy
* Culture
* Animal innoculation
* Serology
* PCR
* Skin test
* Specimens
* Visceral leishmaniasis
* Peripheral blood
* Bone marrow aspirate
* Spleen aspirate
* Microscopy
* Smears(peripheral blood, bone marrow aspirate, spleen aspirate) are stained by Leishman or Giemsa stain and examined under the oil immersion lens. Amastigote forms(LT/LD bodies) can be seen within macrophages and outside
* Culture
* Novy-McNeal-Nicolle(NNN) medium
* This is a blood agar slope with overlay of Locke’s solution (normal saline+filtered urine) with added antibiotics in screw capped bottles.
* Incubated at 24 oC for 7 days
* Promastigote (in clusters) forms grow and can be demonstrated by examining a drop of fluid under microscope after staining
* Animal innoculation
* The clinical specimen material is innoculated in hamsters intraperitoneally and intradermally. The animals are kept at 25 oC. the parasite is demonstrated in smears from spleen.
* Serology
* Specific
* Antibody detection by ELISA
* immunochromatographic dipstick testing of fingerstick blood for antibody to rK39 antigens (visceral leishmaniasis)
* Nonspecific
* NAPIER’S ALDEHYDE TEST: 1ml of clear serum of patient + drop of formalin 🡪shake and kept at room temp 🡪Jellification & opacification within 3 – 30min(POSITIVE)
* CHOPRA’S ANTIMONY TEST: 0.2ml serum diluted 1 in 10ml distilled water🡪, Ovrelayed by 4% urea stibamine 🡪thick flocculent disc within 10 – 15min(POSITIVE)
* Skin test
* MONTENEGRO SKIN TEST---- 0.1ml of killed promastigote antigen intradermally read after 72hrs.
* POSITIVE: dermal leishmania & recovered from kala azar. NEGATIVE: active case of kala azar
* PCR
* DNA amplification by PCR
* Treatment
* **Any of the following regimens**
* **Visceral Leishmaniasis**
* Parenteral therapy
* Pentavalent antimony IV or IM 28 days
* Liposomal Amphotericin B
* Paromomycin for ~21 days
* Pentamidine IV, IM thrice weekly for ~15–30 doses
* Oral therapy
* Miltefosine for 28 days
* Prevention
* Sand fly control