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Parasitology

PHE National Parasitology Reference Laboratory, Hospital for Tropical Diseases, 3rd Floor Mortimer Market, Centre, Capper Street, London WC1E 6JB, TEL: +44 (0) 207 383 0482, FAX +44 (0) 207 388 8985

African Trypanosomes

There are 2 species of African Trypanosomes i.e. *Trypanosoma bruceii rhodesiense.* and *Trypanosoma bruceii gambiense.*
The metacyclic trypanosomes are in the proboscis of the insect vector - infection is therefore inoculative. The above are the aetiological agents of African trypanosomiasis.

Structure of the parasite.

The parasite is an elongated cell with single nucleus which usually lies near the centre of the cell. Each cell bears a single flagellum which appears to arise from a small granule - the kinetoplast. The kinetoplast is a specialised part of the mitochondria and contains DNA. The length and position of the trypanosome's flagellum is variable. In trypanosomes from the blood of a host the flagellum originates near the posterior end of the cell and passes forward over the cell surface, its sheath is expanded and forms a wavy flange called an undulating membrane.

Transmission and vector.

The African trypanosomes are transmitted by tsetse flies (Glossinia). In the insect gut the trypanosomes multiply extensively and undergo morphological change. The completion of the cycle results in metacyclic trypanosomes being present in the proboscis of the vector (African species)

Clinical disease

African trypanosomiasis is a wasting disease which is usually fatal unless treated. In the early stages of the disease there is a high irregular fever with shivering, sweating and an increased pulse rate. The lymph glands near the bite often become swollen, gambiense the glands at the back of the neck and rhodesiense usually the glands under the jaw are affected. Enlarged spleen oedema of the eyelids, face and sleeplessness are features as the disease progresses.

In the late stages of the disease the trypanosomes invade the CNS giving symptoms of meningoencephalitis, mental dullness, apathy, excessive sleeping and incontinence. The CSF usually contains mononuclear cells and a few trypanosomes may be detected. CSF protein is raised. If untreated, coma develops and finally death. Such signs are more commonly seen with gambiense than in rhodesiense in which patients often die before these symptoms develop fully.

Laboratory diagnosis of African trypanosomiasis

Laboratory diagnosis of African trypanosomiasis is by:

1. Examination of blood for the parasites
2. Examination of aspirates from enlarged lymph glands for the parasites
3. Examination of the CSF for the parasite
4. Detection of trypanosomal antibodies in the serum

Examination of blood.

The following techniques are recommended.

1. Thick blood film
2. Buffy coat examination
3. Triple centrifugation technique
4. QBC
5. Miniature anion-exchange centrifugation technique (ref. Transactions Royal Society of Tropical Medicine and Hygiene. 1979. **73**. 312-317)

(a) Examination of lymph gland aspirates.

The aspirate can be examined microscopically by making a wet preparation, or if there is not much material, it can be allowed to dry on a slide and then stained with either rapid Field's stain or with Giemsa.

(b) Examination of CSF.

In the late stages of African trypanosomiasis, trypanosomes may be found in the CSF together with IgM - containing morula (Mott) cells, lymphocytes and other mononuclear cells. Once the CSF has been collected it **must be examined as soon as possible.** The parasites are unable to survive for more than 15-20 minutes in CSF once it has been removed. The parasites become inactive, are rapidly lysed and will not therefore be detected. The CSF should be examined wet and spun down In a sterile tube and a film made from the deposit. The film is then stained with rapid Field's or Giemsa.

NB. it is impossible to distinguish between T.b. gambiense from T.b. rhodesiense on a stained film.