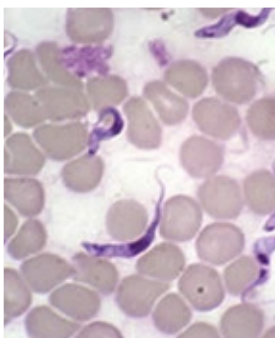




MANAGEMENT OF AFRICAN TRYPANOSOMIASIS IN ANIMALS AND HUMANS

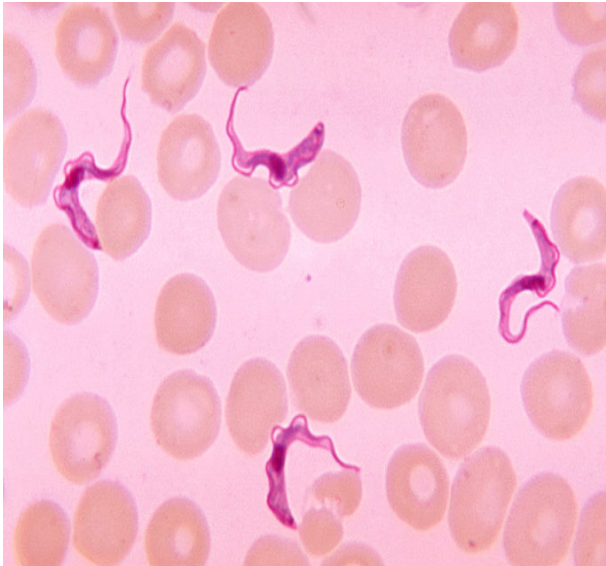


What is African trypanosomiasis?

African Animal trypanosomiasis (AAT), also called ‘nagana’ in cattle is a wasting disease caused by trypanosome parasites that affects domestic and wild animals. Trypanosomiasis is transmitted by the tsetse fly vectors thus follows its distribution in sub-Saharan Africa. However, mechanical transmission by biting flies and fomites is also possible. The disease in camels referred to as “surra” is mechanically transmitted by biting flies. Livestock and wildlife are hosts to the human infective parasites that cause Human African Trypanosomiasis (HAT) also known as sleeping sickness.

What causes African Trypanosomiasis (AAT & HAT)?

It is caused by blood parasites of the *Trypanosoma* spp. The major veterinary species causing AAT are *T. congolense*, *T. vivax*, *T. brucei brucei*, *T. evansi* and *T. simiae*. Human African trypanosomiasis is caused by zoonotic *T. brucei rhodesiense* and *T. brucei gambiense* that manifest as acute and chronic disease respectively in people. Domestic animals act as reservoirs of human infective parasites. The presence of *T. brucei brucei* in livestock is an indicator of circulating human infective parasites.



Blood smear showing trypanosomes

How livestock and people get infected

African Animal trypanosomiasis (Nagana) is transmitted by the bite of infected tsetse flies (*Glossina* spp.), where the parasite undergoes cyclical development. The parasites are transmitted to animals and humans through saliva when bitten by an infected tsetse fly. Trypanosomes can also be spread by fomites such as surgical instruments and mechanical vectors like biting flies and horse flies, especially *T. vivax* and *T. evansi*. *T. equiperdum* causing dourine in horses is sexually transmitted.



Tsetse fly vector



Tabanid fly

Signs and symptoms of the disease in livestock and humans

The major clinical signs of trypanosomosis in animals are: intermittent fever, anaemia, oedema, lacrimation (abnormal or excess production of tears), enlarged lymph nodes, abortion, decreased fertility, loss of appetite, poor body condition and productivity. Acute cases which may be fatal (e.g. hemorrhagic *T. vivax*) show extensive petechiation of the serosal membranes.



Healthy and sick cattle and camel in a trypanosomosis endemic area



Camel suffering from trypanosomosis

Humans

Progression of sleeping sickness has 3 stages: Cutaneous, Hemolymphatic and Central nervous system

- Cutaneous where a swelling develops at the site of inoculation within two days to two weeks of being bitten by an infected tsetse fly



Chancre at site of tsetse fly bite (Source: World Health Organization)

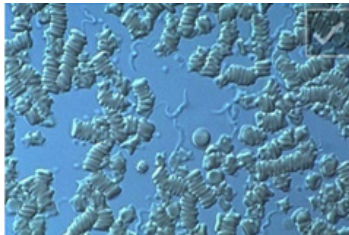
- Haemo-lymphatic stage is characterized by fever, headaches, enlarged lymph nodes, joint pains and itching.
- Nervous stage manifests changes of behavior, confusion, sensory disturbances, staggering and disturbance of the sleep cycle (sleeping sickness). Coma and death are the eventual outcome without intervention.

How is the sleeping sickness diagnosed?

- Observation for clinical signs including swollen lymph nodes.

Laboratory Diagnosis

1. Blood smear - to demonstrate presence of trypanosomes in stained blood smears or wet buffy coat for motile parasites.

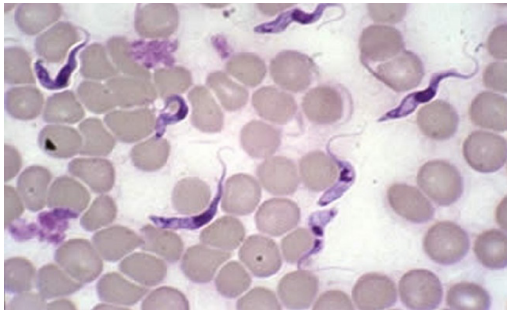


Trypanosomes observed in a Buffy Coat Smear (Source: World Health Organization) Molecular techniques - Polymerase Chain Reaction

2. Microscopic examination of cerebrospinal fluid obtained by lumbar puncture.
3. Use of screening tests – serology to detect antibodies and Rapid agglutination tests to detect species-specific antigens.
4. Molecular techniques - Polymerase Chain Reaction (PCR).



Laboratory diagnosis for trypanosomes



Blood smear showing trypanosomes (Source: MSD Veterinary Manual)

Is there treatment for infected animals/humans?

- Chemotherapy in cattle relies on two compounds; i) Diminazene aceturate (Berenil; Veriben, Diminasan®), which is effective against all trypanosomes species, and ii) Homidium bromide or chloride (Novidium, Ethidium).
- In humans, first stage is treated with Pentamidine and Suramin. Second stage is treated with sleeping sickness Melarsoprol, Eflornithine, Nifurtimox and their combinations. Fexinidazole is an oral treatment for both stages.

How do I Control Trypanosomosis?

- Chemoprophylaxis to prevent infection and enhance host resistance using prophylactic drugs like isometamidium chloride (Samorin® /Trypanidium®; Veridium®) in the tsetse belts.



Samorin sachet for chemoprophylaxis

Tsetse vector control

1. Insecticide sprayed animals
2. Insecticide treated screen and targets
3. use of sterile insect technique(STI)
4. Bush clearing



Biconical tsetse fly trap

- Passive and active surveillance of the human population at risk for HAT to identify patients at an early stage and reduce transmission by removing their reservoir status.
- Use of trypano-tolerant animal breeds with innate resistance to trypanosomiasis such as the N'Dama and Orma Boran sustained in high tsetse density areas.



Trypanotolerant Orma Boran cattle





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