



Kenya Climate Smart
Agriculture Project

Management of Trypanosomosis for Rural Development



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What is Trypanosomosis?

African Animal Trypanosomosis (AAT) also called ‘nagana’ in cattle is a wasting protozoan parasitic disease affecting domestic and wild livestock. Livestock are hosts to the human pathogen parasites, especially *T. b. rhodesiense*, of which domestic and wild livestock are an important reservoir. Livestock can also be infected with *T. b. gambiense* and probably act as a reservoir to a lesser extent.

Human African Trypanosomosis (HAT), also known as sleeping sickness. A disease caused by infection with Trypanosomes which are transmitted by infected tsetse flies.

What causes African Trypanosomosis (AAT & HAT)?

Tsetse-transmitted trypanosomoses are caused by blood parasites of the *Trypanosoma spp.* The major veterinary species are *T. congolense*, *T. vivax*, *T. brucei rhodesiense*, *T. brucei brucei*, *T. evansi* and *T. simiae*. *T. brucei rhodesiense* and *T. brucei gambiense* are known to causing severe HAT respectively in people as the predominant host and domestic livestock acting as source of human infections.



Blood smear showing trypanosomes

How livestock and people get infected

African Animal Trypanosomiasis is transmitted by the bite of infected tsetse flies (*Glossina* spp.). The parasites are transmitted to the host animal in saliva when the tsetse bites the human or livestock host.

People get infected when bitten by tsetse fly which have acquired their infection from human beings or from infected livestock.



Tsetse fly vector



Tabanid fly

Biting flies such as horse flies (Tabanus) and stable flies (Stomoxys) can transmit the disease from infected livestock to healthy ones. Accidental infections in labs have also been documented.

Signs and symptoms of the disease in livestock and humans

Livestock infected with trypanosomosis and the common clinical signs

I Cattle

Primary clinical signs in livestock are intermittent fever, progressive anemia, weakness, weight loss, abortion, reduction in fertility and milk production, swollen lymph nodes and nervous signs like circling and paddling movements.

Other clinical signs include:

- Death of cattle especially if nutrition is poor or there are other stress factors.
- Death may occur in 2 weeks to 2 months without treatment.



Healthy herd of animals in a trypanosomiasis endemic area



Sick cow who is still able in a trypanosomosis endemic area. They continuously lose condition despite good appetite.

II Pigs

Both domestic and wild pigs can become infected with various species of tsetse transmitted trypanosomes,

Clinical signs of trypanosomiasis in pigs include anemia, fever, weakness, reduced fertility, enlargement of lymph nodes and acute death. Signs of rapid emaciation, frequent coughing, and diarrhea are seen in piglets. Emaciation and other signs are found in adults.

III Sheep and goats

Clinical signs in infected sheep and goats include fever, loss of body condition, anemia, loss of appetite and bleeding

IV Camels

In camels, a form of trypanosomosis known as Surra is transmitted mechanically by biting flies including tabanids. The disease is serious in some camels where cases of death can be very high.

Clinical signs include body weakness, reduced activity and milk production, loss of body condition and weight, hemorrhage, rough hair coat, swollen lymph nodes and death if not treated.

- ✓ Surra causes economic losses from cost of treatment, decreased productivity and milk yield, reduced weight gain and reproductive losses



Camel suffering from trypanosomiasis

Humans

Infected humans present the following clinical signs:

- ✓ Development of a swelling at the site of inoculation within two days to two weeks of being bitten by an infected fly
- ✓ Haemo-lymphatic stage is characterized by fever, headaches, enlarged lymph nodes, joint pains and itching.

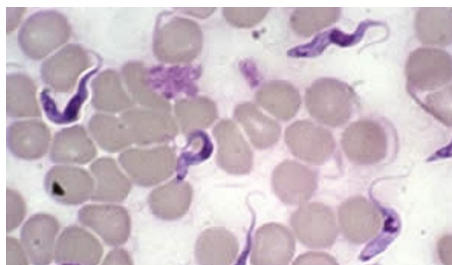
- ✓ Nervous stage manifests changes of behavior, confusion, sensory disturbances, staggering and disturbance of the sleep cycle (sleeping sickness). Coma and death are eventual outcome without intervention.

How is the disease diagnosed?

- Observation for clinical signs including swollen lymph nodes.
- Blood smear - to demonstrate presence of trypanosomes in stained blood smears or wet buffy coat for motile parasites.
- Clinical examination in humans and in some cases analysis of the cerebrospinal fluid obtained by lumbar puncture.



Laboratory diagnosis for trypanosomes



Blood smear showing trypanosomes

- Serologic tests to detect antibodies to trypanosomes in advanced diagnosis
- Rapid agglutination tests to detect species-specific antigens
- Molecular techniques Polymerase Chain Reaction (PCR).

Cure for infected livestock/humans

Treatment in cattle relies on two compounds; i) Diminazene aceturate (Berenil[®], Veriben[®], Diminasan[®], Alfasan), which is effective against all the three African animal trypanosomes, and ii) Homidium bromide or chloride (Novidium[®], Ethidium[®]).

In humans, first stage HAT is treated with **Pentamidine** and **Suramin**. Second stage is treated **Melarsoprol**, **Eflornithine**, **Nifurtimox** and **their** combinations. **Fexinidazole** is an oral treatment for both stages.

Controlling Trypanosomosis

- Chemoprophylaxis to prevent infection and enhance host resistance using prophylactic drugs like isometamidium chloride (Samorin[®] /Trypamidium[®], Merial; Veridium[®], Sanofi) in areas with high tsetse population density.
- Tsetse vector control by frequent spraying and dipping of livestock, pour-on treatment of livestock as moving targets, aerial and ground spraying of trypanocides on fly-breeding areas and bush clearing.
- human population at risk for HAT to identify patients at an early stage and reduce transmission by removing their reservoir status.
- Use of trypanotolerant animal breeds with innate resistance to trypanosomiasis such as the N'Dama and Orma Boran sustained in high tsetse density areas.



Biconical tsetse fly trap



Trypanotolerant Orma Boran cattle



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