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Perspective

Human African Trypanosomiasis (HAT): Sleeping Sickness

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DESCRIPTION

A potentially fatal condition known as sleeping sickness or human African trypanosomiasis is caused by the related parasite strains *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*, which are spread by the tsetse fly. Sleeping sickness in its early stages frequently goes undiagnosed. If it is not treated, the parasite can enter the central nervous system and cause advanced stages of sleeping sickness by crossing the blood-brain barrier. People have neuropsychiatric symptoms like disturbed sleep, disorientation, lethargy, and convulsions during this phase.

24 nations in West and Central Africa are home to *Trypanosoma brucei gambiense*. A person may be infected for weeks, months, or even years without experiencing any severe disease symptoms or signs. By the time more apparent symptoms start to appear, the disease already gets advanced and severely affects the central nervous system in the patient.

Trypanosoma brucei rhodesiense is found in 13 countries of Eastern and Southern Africa's. These days, this type signifies less than 3% of reported cases and results in an acute infection. The first signs and symptoms might appear even many months later, if not in a few weeks after infection. The illness spreads quickly and attacks the nerve system.

A different type of trypanosomiasis is primarily found in Latin America. It is often referred to as chagas disease or American trypanosomiasis. A different *Trypanosoma* subgenus, a different vector, and distinct clinical symptoms set the causative agent apart from Human African Trypanosomiasis (HAT).

Infection and illness progression

The greater majority of human cases are carried by tsetse flies sucking human blood and passing on *T. brucei* trypanosomes. While consuming the blood of diseased humans or other infected mammals, the flies catch the disease. Flies that have taken up the parasites typically take 12 to 15 days to infect people. The trypanosomes multiply in the fly's midgut during this time through binary division, then move to salivary glands, and finally leave the fly's proboscis through droplets of saliva while sucking blood.

Trypanosomes are detected in substantial numbers in the bloodstream after an incubation time of one to two weeks in humans. The spleen and lymph nodes are then invaded and become large, painful, and squishy. One typical symptom of the condition is the noticeable swelling of the lymph nodes at the back of the neck also known as "Winterbottom's sign".

Infection and symptoms

Although there are various ways to become infected, the disease is mostly spread through the bite of an infected tsetse fly. Trypanosomes can penetrate the placenta and infect the fetus in mother-to-child infections. It is conceivable for mechanical transmission to occur through other bloodsucking insects. However, determining its epidemiological impact is challenging. In laboratories, accidental infections have happened as a result of punctures with infected needles. It has been documented that sexual interaction can also transmit the parasite.

Trypanosomes multiply in subcutaneous tissues, blood, and lymph during the initial stage. The haemo-lymphatic stage, as it is often known, is characterised by episodes of fever, headaches, swollen lymph nodes, joint discomfort, and itching. The parasites enter the central nervous system through the blood-brain barrier in the second stage. This is neurological or meningo-encephalic stage. Typically, this is the time when the disease's most obvious signs and symptoms like behavioural abnormalities, disorientation, sensory difficulties, and impaired coordination start to exhibit. The disease's name, which derives from sleep cycle disruption, is a key characteristic. Despite reports of healthy carriers, sleeping sickness is thought to be lethal if left untreated.

Only travellers to Africa are susceptible to African sleeping sickness. The tsetse fly can only transmit the parasites that cause the sickness. They just live in remote places. They inhabit savanna forest thickets and dense vegetation near streams. Most

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of the time, visitors to cities and other urban regions are not at risk. Tropical Africa is where the sickness is primarily found.

Prevention, diagnosis and treatment

By avoiding regions where there are a lot of tsetse flies, people can lessen their risk of getting bitten by one. If you're travelling to an area of Africa enquire locals where tsetse flies are common and stay away to those places. To avoid being bitten by Tsetse flies through thin clothing, wear bulky long-sleeved tops and long pants. Tsetse flies are attracted to bright or dark colours, so dress in neutral hues that fit nicely with the surroundings. Use insect repellents as required, even though they might not work against tsetse flies.

The earlier sleep sickness is identified and treated, also improves the chances of recovery. The diagnosis is made by microscopic analysis of the cerebrospinal fluid for elevated levels of white blood cells and of the blood and lymph for the presence of trypanosomes. The results of these tests are then used to establish the disease's stage and the best course of treatment.

Early cases of East African sleeping sickness respond well to suramin. When treating the West African type's early stages, pentamidine is a substitute for eflornithine. Eflornithine is used to treat the West African version of the disease in later stages that affect the central nervous system. As a second-line treatment for the East African variant, melarsoprol, an extremely toxic organoarsenic chemical, may be employed. The fulminating toxemic stage of *T. brucei rhodesiense* infection renders all treatments ineffective. For the treatment of West African sleeping sickness, researchers are looking into combination medicines based on eflornithine. Eflornithine and nifurtimox, a medication used to treat Chagas disease, have been found to work best together.