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Trypanosomiasis

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Introduction

Trypanosomiasis is caused by parasitic protozoa of the genus *Trypanosoma*. There are two major forms of disease, African trypanosomiasis (sleeping sickness) and American trypanosomiasis (Chagas' disease).

The disease sleeping sickness is caused by *T. brucei* of which there are two subspecies that affect humans, *T. brucei rhodesiense*, which occurs mainly in East Africa, and *T. brucei gambiense*, which occurs mainly in West Africa. Both subspecies are transmitted by the tsetse fly.

Chagas' disease is caused by *T. cruzi* and transmitted by the reduviid bug. The disease occurs in South and Central America and Mexico.

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Epidemiology

Global Epidemiology

African trypanosomiasis

African trypanosomiasis is confined to tropical Africa between 15° north latitude and 20° south latitude, or from north of South Africa to south of Algeria, Libya, and Egypt [1]. In 1998, nearly 40,000 cases were reported to the WHO, although this was probably an underestimate of the true figure. In 2004 the number of reported cases had dropped to 17,616 and in 2006 estimated numbers of new cases per annum ranged from 17,500 to 25,000 [2].

American trypanosomiasis

American trypanosomiasis occurs in Mexico, Central America, South America, and rarely in the United States. During the 1980's more than 20 million people were thought to be infected. Due to concerted attempts to bring the disease under control, the current figure is thought to be from 8 to 11 million. [3,4].

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Trypanosomiasis in travellers from England, Wales, and Northern Ireland

Between 1990 and 2007, a total of 14 cases of African trypanosomiasis have been reported in travellers from England, Wales, and Northern Ireland either through routine laboratory surveillance or by case reports in the literature.

There were nine laboratory-confirmed cases of African trypanosomiasis (*T. brucei*) reported through routine surveillance. Only five of the nine cases had travel history information; three had returned from Zambia and two from an unspecified African country [5,6,7,8]. Five further cases were reported in the literature: two siblings, aged nine and 14 years, diagnosed with East African trypanosomiasis on return from a safari in Tanzania [9]; one case in a UK resident in 2001 who had travelled to Tanzania and Kenya [6,10]; a British soldier with trypanosomiasis in 2005 on return from Malawi [11]; and a single case in a 38 year old British man who had spent two and a half years travelling around Namibia, Mozambique, Malawi, and South Africa [12].

Eight other cases of African trypanosomiasis were reported to TropNet Europe in travellers from other European countries [5,10].

There have been no reported cases of American trypanosomiasis in UK travellers since 1983 [7].

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Risk for Travellers

All types of trypanosomiasis are rare in travellers. Travellers who visit rural areas of endemic African countries are at greatest risk for African trypanosomiasis, including those on safari in game reserves, as evidenced by cases of imported East African trypanosomiasis [5,12].

American trypanosomiasis is a risk for those in endemic Latin American countries who stay in poorly constructed rural accommodation made from mud or thatch.

Travellers residing in well constructed, modern buildings that do not provide a habitat for the vector of American trypanosomiasis, are at negligible risk [4].

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Transmission

African trypanosomiasis is transmitted by tsetse flies of the genus *Glossina*. *T. brucei* protozoa are carried in tsetse fly saliva. Humans are the main reservoir for *T. brucei gambiense* and wild and domestic animals, such as antelope and cattle, are the main reservoirs for *T. brucei rhodesiense* [13]. Tsetse flies are grey-brown insects the size of a honey bee. They inhabit savannah areas, including game reserves and thrive in shade and humidity.

American trypanosomiasis is transmitted through contact with the faeces of an infected reduviid ("cone nose" or "kissing") bug (*Triatoma infestans*) [14]. The bugs inhabit walls and roofs of poorly constructed housing such as that made of mud and thatch. *T. cruzi* are excreted in the faeces of the bug and inoculated into the blood through skin or mucous membranes during feeding, or when the bite is scratched.

Transmission of both species can also occur via blood transfusion, contaminated needles, or the congenital route. Occasional outbreaks of American trypanosomiasis have also been reported as a result of consuming food and drink contaminated with triatomine faeces. An outbreak of 128 confirmed cases at a school in Venezuela was associated with contaminated fruit juice [15].

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Signs and Symptoms

African trypanosomiasis

There are two types of illness, East African trypanosomiasis caused by *T. brucei rhodesiense*, and West African trypanosomiasis caused by *T. brucei gambiense* [1,13,16]. East African trypanosomiasis is a more acute illness with a rapidly progressive course.

The first symptom to occur is a skin lesion at the site of the tsetse fly bite, known as a trypanosomal chancre. This is commonly accompanied by regional lymphadenopathy and occurs in 50% of those with the East African disease.

At Stage 1 of the disease the local chancre appears, and then parasites disseminate via the draining lymph node into the bloodstream [16]. Following this, an irregular pattern of fever, headache and malaise persist for several weeks. In *rhodesiense*

infection more severe symptoms occur, that can include pancarditis with congestive cardiac failure, pericardial effusion and pulmonary oedema, and which can be fatal.

During Stage 2, trypanosomes cross the blood-brain barrier and cause encephalopathy with headache and personality changes [16]. This occurs within weeks in the East African trypanosomiasis and within months with the West African form. As the disease progresses to the terminal stage, patients experience disruption to their normal sleep pattern, and become progressively somnolent, which gives the disease its name of "sleeping sickness".

American trypanosomiasis

The initial acute phase of American trypanosomiasis may go undetected due to the non-specific signs and symptoms of vomiting, diarrhoea, and anorexia. A cutaneous lesion at the site of exposure to infected bug faeces can develop. If the organism enters via the eye, unilateral conjunctivitis and oedema may be present which is known as Romaña sign [4,16].

This acute phase is then followed by an indeterminate phase with no clinical symptoms, and may last for the life of the patient. However, some patients will develop a cardiomyopathy termed chagasic heart disease, with symptoms of palpitations, chest pain, oedema, syncope and dyspnoea with occasional sudden death. Cardiac embolism can also occur.

In addition to cardiac disease a small number of patients develop abnormalities of the alimentary tract, with regurgitation, dysphagia, loss of peristalsis and constipation [16]. This syndrome is termed mega disease.

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Treatment

Travellers suspected of having trypanosomiasis should be referred to a tropical disease specialist. Depending upon the stage of infection, parasites of both forms of illness can be detected in blood films. In African trypanosomiasis the parasite can be isolated from the initial chancre and occasionally from cerebrospinal fluid if the central nervous system has been invaded [10,13].

There are several drugs available for the treatment of acute illness of both the African and American forms of the disease. Administration of these drugs is complex and they frequently have serious adverse effects [17-19].

There are only a limited number of drugs available to treat African trypanosomiasis [13,18], and most of them have been in use for more than 40 years. Supply problems have occurred as drug production is not economically viable. Drug treatment has previously been shown to have little effect on the chronic stage of Chagas' disease [19], however, more recently published data indicate that treatment

may slow the development and progression of cardiomyopathy [18]. The cardiac and intestinal complications, of Chagas disease, are managed by symptomatic therapy and occasionally with surgical intervention.

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Prevention

There is no vaccine or chemoprophylaxis against trypanosomiasis. Awareness of risk and [insect bite avoidance](#) is therefore the only method of preventing infection.

Tsetse flies are attracted by movement and the colour blue. They have been known to follow moving vehicles; therefore windows should remain closed when driving through endemic areas. Tsetse flies are also capable of biting through loose weave fabrics and are unaffected by many insect repellents. Travellers are advised to wear insecticide-treated close weave and loose fitting clothing.

Reduviid bugs inhabit cracks in the walls and roof of buildings constructed with mud or thatch. Travellers residing in such accommodation should sleep under an insecticide-treated bednet.

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Reading List

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Reddy M, Gill S, Kalkar S et al. Oral drug therapy for multiple neglected tropical diseases; A Systematic Review. JAMA. 2007;298:1911-24.

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Links

World Health Organization – Human African trypanosomiasis

http://www.who.int/trypanosomiasis_african/en/

World Health Organization – Pan American Health Organization; Chagas' Disease (American trypanosomiasis)

<http://www.paho.org/english/hcp/hct/dch/chagas.htm>

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