

Human African Trypanosomiasis and challenges to its control in Urambo, Kasulu and Kibondo Districts, western Tanzania

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Abstract: A study was carried out to determine the prevalence and management of Human African Trypanosomiasis (HAT) in Urambo, Kasulu and Kibondo districts of western Tanzania. Parasitological surveys for trypanosome and other blood parasites were conducted in selected villages. Interviews with health workers were conducted to explore facility capacity to diagnose and manage HAT. Community knowledge on tsetse and availability of trypanocidal drugs was explored. Results showed that, although health facility records showed HAT is an important public health problem in the three districts, trypanosomes were found in 0.6% of the examined individuals in Urambo district only. Malaria parasites with a prevalence of 12.1%, 19.7% and 9.7%, in Urambo, Kibondo and Kasulu, respectively were detected in blood samples from the same individuals examined for trypanosomes. There was poor capacity for most of the health facilities in the diagnosis, treatment and control of HAT. In both districts, communities were knowledgeable of the tsetse identity (82.4%) and had experienced tsetse bites (94%). The majority (91.4%) of the community members knew that they were at risk of acquiring HAT. However, only 29% of the respondents knew that anti-trypanocidal drugs were readily available free of charge from health care facilities. Late treatment seeking behaviour was common in Kasulu and Urambo districts. In conclusion, health facilities in western Tanzania are faced with problems of poor capacity to diagnose and manage HAT and that treatment seeking behaviour among the communities at risk is poor. Efforts should be made to strengthen the capacity of the health facility to handle HAT cases and health education to the population at risk.

Key words: Human African Trypanosomiasis, diagnosis, control, Tanzania

Introduction

Human African Trypanosomiasis (HAT) or sleeping sickness is a vector-borne parasitic disease caused by trypanosomes and transmitted by tsetse flies of the genus *Glossina* (Buxton, 1955). In Tanzania, like in Southern and other East African countries, *Trypanosoma brucei rhodesiense* is the only form of the disease known to occur (Kilama *et al.*, 1981; Stich *et al.*, 2002). Tsetse flies infest much of the sub-Saharan Africa (in vegetations by rivers and lakes, gallery forests and wooded savannah) (Ford & Katondo, 1997). About two-thirds of Tanzania is home to the tsetse fly and that over 4 millions people living in rural areas are at risk of contracting HAT. Only less than 1% of people that are at risk of infection are under regular medical surveillance (Komba *et al.*, 1997). The rural populations whose livelihoods depend on agriculture, fishing, animal husbandry or hunting are the most exposed to the tsetse bites.

HAT is endemic in about 10% of the districts in Tanzania. It is estimated that 4-5 million

Tanzanians are at risk of the disease (Kibona *et al.*, 2006). Available data indicate that between 1996 and 2005, a total of 2571 cases of HAT were reported in Tanzania (Kasulu =40.4%, Kibondo =35.3%, Urambo =16.1%). Other affected districts include Babati, Monduli, Hanang, Nkasi, Mpanda and Chunya (Ministry of Health, unpubl.).

In HAT cases, it is important that diagnosis be made as early as possible in order to preclude the onset of irreversible neurological disorders (Dumas & Bisser, 1999) and prevent transmission. Nonetheless, case detection is difficult and requires major human, technical and material resources, which are inadequate in most health facilities in the HAT endemic districts in Tanzania.

One of the major constraints in HAT control in Tanzania is lack of information regarding the actual extent of the disease in the country. This among other factors has been attributed by a weak disease surveillance system, poor diagnostic capability and lack of trained staff. While vector control is necessary for the reduction of human

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vector contact and thus reduction in transmission of the disease; disease surveillance is imperative for early and effective diagnosis.

This study was carried out to determine the current status of HAT in western Tanzania following its resurgence in recent years (Ministry of Health, unpubl.). Specifically, this study aimed at obtaining information on the status of HAT in endemic districts of Urambo, Kasulu and Kibondo in western Tanzania with major emphasis on the diagnostic and case management capability of health care facilities and community knowledge of the disease and availability of treatment.

Materials and Methods

Study area and population

This study was carried out in Kasulu, Kibondo and Urambo districts in western Tanzania. Kasulu (4°30'S, 30°00'E) and Kibondo (4°07'S, 31°00'E) districts are in Kigoma region and the districts are served by Malagarasi river valley which is a typical tsetse fly belt with forest, game reserve and open grassland. The population in this area is for the most part concentrated in the villages on the Kigoma-Kibondo trunk road. HAT infections are contracted mainly by those hunting, fishing, timbering, collecting honey, herdsman and those travelling in the bush on other occasions in search for basic necessities of life. Urambo district (4°45'N, 32°00'E) is in Tabora region and has similar characteristics as those of Kibondo and Kasulu districts.

Parasitological surveys

Eight villages were conveniently selected for survey in Urambo district, while in Kibondo and Kasulu, six and five villages were covered, respectively. In each selected village, 50-100 people preferably those with forest related activities which include honey gathering, timbering, charcoal works, fisheries, hunting, herdsman and as well as those with clinical presentation of the disease were actively screened and examined microscopically for trypanosomes and other blood parasites. Case detection was also conducted by actively screening people in the community especially those with activities that make them more prone to tsetse bites and hence the infection.

Peripheral blood was collected aseptically and investigated using blood slide stained by Field's stain A and B, then dried in the open space before detection was done using microscope under the magnification of x100. Confirmatory test for trypanosomes was done using Haematocrit Centrifugation Technique.

In-depth interviews

Face-to-face in-depth interviews were conducted to health workers including the district medical officers, in-charges of health facilities and laboratory technicians/ assistants of Kasulu, Kibondo and Urambo district hospitals and Kaliua Health Centre. Other health facilities workers were from Lumbe, Igagala and Usinge (Urambo), Busunzu and Kumhansha (Kibondo) and Kifura (Kasulu). Information was explored to whether the medical personnel and health facilities were able to manage cases of HAT. Medical personnel were also asked about the treatment seeking behaviour of the community. Information was sought on availability of equipment and supplies for laboratory diagnosis of HAT.

Community in-depth interviews were also conducted to explore their knowledge on tsetse flies, experience in tsetse bites, the risk associated with tsetse flies, and availability of drugs for HAT treatment.

Results

Blood samples from a total of 1087 individuals were examined for the presence of trypanosome species. In Kaliua, Urambo, only 3 (0.6%) people were found to be positive with trypanosomes parasites. We did not intend to screen for malaria parasites, however, they were observed during HAT screening. Although only three HAT cases (2.9%) were detected through active case detection in Usinga village, passive case detection identified a total of 34 cases from Lumbe, Usinga, Kangeme and Igagala in Kaliua Division of Urambo district. Malaria cases were actively detected in each village surveyed. Malaria parasitaemia rates were 12.12% in Urambo, 19.7% in Kibondo and 9.7% in Kasulu district (Table 1).

All in-charges of Health Centres and Dispensaries at Kaliua, Lumbe, Igagala, Usinge, Busunzu, Kumhansha and Kifura admitted that HAT was one of the major health problems in their catchment areas. Similar opinions were given by laboratory personnel at the district hospitals. However, health workers in the refugee camps (Nyarugusu, Nduta and Mtabila) were of the opinion that the disease was not a major public problem.

All the three District Medical Officers (DMOs) admitted to receive cases of HAT at different stages of the disease. The DMO for Kibondo reported that patients were seeking medical attention at an early stage of the disease. In Kasulu and Urambo the DMO reported that patients in their respective districts were seeking medical attention mostly at the late stages of the disease, because they usually attend to traditional

healers or resort to the use of antimalarial drug against clinical fever. Records from the district reports showed that 9, 5, and 4 villages were mostly affected in Kibondo, Kasulu and Urambo districts, respectively (Table 2).

It was observed that Kasulu district hospital was also receiving patients from neighbouring districts of Kibondo (Busunzu village) and Urambo (Usinge) and Kigoma rural

(Basanza and Nguruka).

According to all the three DMOs, anti-trypanocidal drugs were available to patients, free-of charge at the district hospitals. The districts were obtaining their drug supplies from the Medical Store Department of the Ministry of Health or the World Health Organization through the National Institute for Medical Research. The responses from the health workers are summarised in Table 3.

Table 1: Prevalence of trypanosome and *Plasmodium falciparum* parasites among people in Urambo, Kibondo and Kasulu districts

District	Village	No. screened	Trypanosome +ve	Malaria +ve
Urambo	Lumbe	125	0	8 (6.4%)
	Kangeme	101	0	3 (2.9%)
	Usinga	104	3 (2.9%)	13 (12.5%)
	Usinge	76	0	20 (19.9%)
	Maboha	32	0	6 (18.75%)
	Kombe	39	0	5 (12.82%)
	Igagala	18	0	5 (27.7%)
	Total	495	3 (0.6%)	60 (12.12%)
Kibondo	Kifura	67	0	13 (19.4%)
	Kisogwe	77	0	21 (27.3%)
	Nyamkwi	50	0	9 (18%)
	Kigendeka	50	0	4 (8%)
	Kumbanga	43	0	10 (23.3%)
	Kumhasha	28	0	5 (17.9%)
	Total	315	0	62 (19.7%)
Kasulu	Makere	62	0	6 (9.7%)
	Nyamidaho	65	0	5 (7.7%)
	Mvugwe	54	0	4 (7.4%)
	Kagera Nkanda	53	0	8 (15.1%)
	Mvinza	43	0	4 (9.3%)
	Total	277	0	27 (9.7%)

Table 2: Villages with most cases of HAT patients in Kibondo, Kasulu and Urambo Districts

Kibondo District	Kasulu District	Urambo District
Busunzu	Kagera-Nkanda	Usinge
Kifura	Mvinza	Kangeme
Nyankwi	Nyamidaho	Kombe
Kisogwe	Makere	Usinga
Nyaruyoba	Mvungwe	
Kigaga		
Kigendeka		
Kabuya		
Kumshindwi		

Table 3: Responses on the situation as regards to HAT management according to health workers in Urambo, Kibondo and Kasulu districts

Type of service/supplies	District			
	Urambo District Hospital	Urambo Kaliua Health Centre*	Kibondo District Hospital	Kasulu District Hospital
Case management	Not capable	Capable	Capable	Capable
Treatment seeking behaviour	Late	Late	Early	Late
Human resource	Inadequate	Inadequate	Inadequate	Inadequate
Laboratory supplies	Inadequate	Inadequate	Adequate	Adequate
Laboratory space	Inadequate	Inadequate	Inadequate	Inadequate

In-charges of laboratories at district hospitals in Kibondo and Kasulu reported to have sufficient laboratory facilities and supplies for diagnosing parasitic infections including trypanosomes. In both districts, blood slides for trypanosomes were done on routine basis. However, in both district hospitals, laboratory space was a limiting factor in providing adequate services. Moreover, health workers in Kibondo and Kasulu hospitals complained of lack of continuing education and refresher course to up-date their knowledge and skill on trypanosomiasis.

Of the four health centres surveyed, only Kaliua Health Centre (in Urambo district) had the

because their daily socio-economic activities expose them to tsetse bites and hence the disease. It was also noted that some of the people could recognize clinical presentation of the disease. Most people interviewed were not aware that drugs are given free of charge. There was a high tendency for some sick people to attend to traditional healers before consulting conventional health facilities. This appeared to be the factor behind the late stage phase increase of the disease. Generally local people had knowledge that tsetse flies were responsible for transmission of trypanosomiasis and they were willing to participate in tsetse control programmes (Table 4).

Tables 4: Percent of respondents with knowledge on tsetse fly and availability of drugs

Knowledge on	Urambo	Kibondo	Kasulu	Average
Tsetse identity	98.2	61.5	81.6	80.4
Having bitten by tsetse	98.8	90.1	93.2	94.0
Risk associated with tsetse flies	84.6	96.4	93.3	91.4
Availability of free drugs	35.5	40.6	13.0	29.7
Total interviewee	169	122	136	-

capacity to diagnose, confirm and treat HAT. This was the only facility with the capacity in Urambo district. However, most of their patients were seeking medical attention at a late stage of the disease. Interestingly, in Kibondo and Kasulu while all refugee camps health facilities had the capacity to diagnose trypanosomes, the public-owned health facilities lacked such capacity and referred suspected cases to Kibondo and Kasulu District Hospitals. Health workers in the surveyed health centres and dispensaries reported lack of anti-trypanocidal drugs.

Community interviews showed that most people were able to associate the presence of tsetse and sleeping sickness. Males were at higher risk of contracting the disease than females. This was

On average 82.4% of the respondents in the three districts had seen and could recognise a tsetse fly; 94.0% had experienced a bite from tsetse fly; 91.4% knew that they were at risk of acquiring tsetse-borne infections and only 29.% were aware that free drugs were available at health facilities. The majority of the respondents reported that the drugs were sold either at the health facilities or by drug vendors.

Discussion

HAT is sometimes mistakenly for malaria due to the fact that early phase of the disease entails bouts of fever, headaches, pains in the joints and itching. Thus with the high incidences of malaria in western

Tanzania, HAT is mistakenly treated as malaria. During the survey only 0.6% of the people were found positive to trypanosomes. The co-infection between malaria and HAT appeared to be very common in the districts. However, further investigation is recommended to assess its true magnitude. Other haemoparasites such as *Borrelia duttoni* species have been reported to cause febrile illness in malaria-endemic areas in Tanzania and hence is another important differential diagnosis for fever (Talbert, 2005). It is therefore important that laboratory diagnoses are always made to confirm the disease before treatment is prescribed. It has already been observed that sleeping sickness affects remote and rural areas of sub-Saharan Africa where health systems are least effective, or non-existent. In other parts of the tsetse-infested belt, HAT spreads with socio-economic problems such as political instability, displacement of populations, war and poverty (Moore *et al.*, 2001; Ekwanzala *et al.*, 1996; Stanghellini & Josenando, 2001; Smith *et al.*, 1998).

Trypanosomiasis cases are only managed at few health facilities, which are also understaffed. Critical understaffing was observed in Urambo district at Kangeme, Kombe, Usinga, Ulindwanoni and Tuombe Mungu dispensaries, which had no trained health personnel (data not shown). Lack of capacity to diagnose and manage HAT in most health facilities force sleeping sickness patients to travel long distances (15-110km) to seek medical attention at the district hospitals or Kaliua Health Centre. Most of the roads in these districts are impassable during the rainy season. These factors are likely to be among the main reasons as to why most people seek medical attention when the disease has reached the late stage. It is important that all health facilities in this part of Tanzania, are well equipped with adequate qualified staff, equipment, laboratory supplies and drugs to manage HAT cases. Improving laboratories is vital in any disease surveillance system as it will provide an early warning in case of an outbreak (Mghamba *et al.*, 2005).

In Tanzania, HAT is successfully treated with suramin; but treatment of late-stage of the disease, where trypanosomes have invaded the central nervous system, depends exclusively on melarsoprol. The regimen for HAT is strict and hard to apply. In short, most drugs are old, difficult to administer in poor conditions and by no means always successful. Early diagnosis of the disease, which would guarantee low-risk treatment on an outpatient basis, can rarely be achieved (Stich *et al.*, 2002). Moreover, there is great evidence for resistance to the HAT drugs that have been in continuous use for at least over 5 decades (Croft *et al.*, 1997; Kibona *et al.*, 2006).

The disease can be successfully controlled by a combination of approaches including active case finding, treatment of patients and vector control (WHO, 1998). Detection of the disease calls for major human and material resources, such as well-equipped health facilities and qualified staff. Because such resources are lacking, most people with sleeping sickness die before they can ever be diagnosed (Bailey & Smith, 1992).

Health education should be provided to all communities in villages where HAT is endemic. Health education should emphasise the need for early reporting of any trypanosomiasis suspected case to the health facility to avoid the late stage of the disease; which is difficult to treat. Communities living adjacent to tsetse-infested forests should be educated on the risks associated with forest activities; and initiations of community based tsetse control programs to reduce the tsetse - man contact. However, this can only be possible, if alternative income generating activities are introduced in HAT endemic areas. In conclusion, HAT is a public health problem in western Tanzania. Efforts should be made to strengthen case management and vector control programs in all endemic villages.

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