

Review Article

Evolution of African Human Trypanosomiasis in the Democratic Republic of Congo During the Year 2005

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Abstract: The illness has caused most devastating and lethal epidemics at the beginning of the colonial era in the Democratic Republic of Congo. Between 1885 and 1920, parasites have decimated the population of several infected areas. The second major outbreak started in 1920 and reached its peak in the 1930s and 1940s. At this time, a very impressive means for a policy based on active research, patient care and sanitation of the community living environment. According to the national fight against (sleeping sickness), African human trypanosomiasis, in the eve of independence, the rate of African human trypanosomiasis had a very low level (0.01%). After independence, due to the relaxation of the shares, the destruction of health facilities and the care of the sick, it was observed that the disease has gradually increased in almost all old houses. After independence, due to relaxation of the actions, the destruction of health facilities, as well as the care of the sick, it was observed that the disease gradually increased in almost the all old houses. Currently, trypanosomiasis remains a major health problem in the Democratic Republic of Congo. The government, assisted by United Nations Agencies and International NGOs, has, since 1968, a specialized service to combat the disease. This is the national program for the fight against African human trypanosomiasis that rules the national policy in this area.

Keywords: Glossina, Trypanosomes, African Human Trypanosomiasis

1. Introduction

African human trypanosomiasis (sleeping sickness) is becoming a major endemic to Africa, protozoan, and seems to be in all area of life in our country. It is not only a rural disease, but soon as urban conurbations due to several factors that contribute to persistent movements of populations [1-2].

It is important to consider the fight against sleeping sickness as a specific problem, the tragic in human terms, if it is not solved. The World Health Organization (WHO) said that 55 million people living in rural areas are exposed to Tse Tse Glossina, flies responsible for the disease [3].

This terrible disease is certainly with the slave trade, and other factors, the main cause of the exodus from Africa. At the end of the 19th century and in the beginning of the 20th, lethal

epidemics of African human trypanosomiasis (sleeping sickness) broke out in many major outbreaks in Africa and particularly in the Democratic Republic of Congo [4]. Health problems that were allowed during colonization and the beginning of independence in our country have become widespread in rural and urban areas because of the destruction of basic infrastructure and the abandonment of reorganization measure.

The control of trypanosomiasis is one of the priorities of the African continent, which is part of the research agenda established by the World Health Organization, focusing on the major tropical diseases. In our country, the program is implemented by the national program for the fight against African human trypanosomiasis.

The problem is that, in the light of the information gathered

by the national program for the fight against African human trypanosomiasis in 2005 can confirm the thesis of great writers such as GENTILINI and GOLVAN that African human trypanosomiasis (sleeping sickness) which is becoming an endemic not only to Africa, but also in the Democratic Republic of Congo, its spread has no borders, and goes beyond urban areas.

African human trypanosomiasis (sleeping sickness) is a group of parasitic protozooses trypanosome brucei group due to the transmitted by the bite of the community (Tse Tse flies *Glossina*), characterized clinically by the occurrence of meningoencephalitis in spontaneous development is always fatal. It occurs in parts of Africa and the black station is strictly located roughly between the twelfth and fifteenth degree north latitude south latitude [3].

This parasitosis formerly known as sleeping sickness, is called the African human trypanosomiasis, which was adopted by the World Health Organization (WHO). It presents a threat to more than 60 million people, of which 10 million are under permanent surveillance.

It is classified with malaria, schistosomiasis, onchocerciasis, and other major diseases caused the most disabling and making worst African life [5].

The elements of the existence of African human trypanosomiasis in each of these areas of health are ecological, geological, botanical, and socio-economic, those who promote, on the one hand, the contact between hosts and vectors (the community) (man and domestic animals in particular) and, on the other hand, they set up the disease without medical intervention.

1.1. Biology

The trypanosomes are flagellated protozoa sanguinens. They live in the blood, where they are not within the longitudinal cell and multiply by fission [3]. Training is between 18 and 30 days after the infecting meal and digestion and can in turn transmit the parasite and left all his life. The trypanosome is transmitted during blood feeding of the tsetse fly injects saliva with thousands of trypanosomes youth. those are extra cellulaires, vievent in the liquid inside and migrate to different organs. Three forms are distinguished: long, squat and intermediate [4-14].

The extra cellular protozoan flagellates in the fusiform 40µm up to long and thin (host) or when they are short and stocky 15µm (chistidia) [1]. The liquid in their hosts, or the blood, lymph node, the cerebrospinal fluid or saliva (*Glossina*) median and economic nucleus flagellum form an undulating membrane surrounding the cell body.

There are two forms of trypanosomes in Africa: *Trypanosoma brucei gambiense* African human trypanosomiasis (sleeping sickness) in charge of the west and central Africa and *Trypanosomiasis brucei rhodesiense* which occurs in eastern and southern africa [6].

Two species are recognized as human pathogens, namely:

* *Trypanosoma cruzi*, head of the American trypanosomiasis or Chagas disease is in south America, and the vector is a bug.

* *Trypanosoma brucei*, located in regions where the tsetse fly. With only three species provided by the community, it is of *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*, *Trypanosoma brucei brucei*, the first two are responsible for african trypanosomiasis and while the latter is the animal trypanosomiasis [7-8].

The trypanosomes are first in the body and in the community as from epimastigote and midgut digestive tract and is found in the salivary glands of the bug into a form trypanostigote.

1.2. Localization and Classification

These flies have acquired the historic name of tsetse fly from the name of MATEBELE tribe of south Africa spread by the explorer Livingston, *Glossina* used by entomologists due to the shape of the trunk with a tongue when they are at rest.

Areas, or there is the risk of being bitten by a tsetse fly are generally as follows: the secular trees and other places of camping in the countryside, the area around the drill into bodies of water, the vegetation near places baignade and fetching water on the banks of rivers and streams, savanna residents, forests or cemeteries planted with trees, fishing and vegetation surrounding villages [4, 13-14].

There are several species living in tropical Africa. The community are strictly in the hydrophilic species that live in the forests and rivers which form the palpalis group *Glossina fuscipes tachynoides* mainly linkage, and give the *trypanosoma brucei gambiense* in almost any part of the west and central Africa, characterized by a general trend with slow, sometimes from the emitted but the pig and human in the forests for the last two.

And in the dry savanna species that prefer to form the group moristans as *Glossina moristans*, *Glossina pallidipes* and *Glossina swynnertoni*, they convey the *trypanosoma brucei rhodesiense* in east Africa by differentiating the previous epidemiology, its history and its evolution and rapid, acute and fatal. [9].

1.3. Diagnostic

Chagas disease can be diagnosed by laboratory tests on blood and c.s.f. (cerebrospinal fluid) is [1].

*A the phase of blood lymphato

The elements of suspicion: the numbering format packet indicates anemia and lymphocytosis.

The diagnosis of certainty: the indirect immuno fluorescence was positive, but requires high rates because of frequent cross reactions with the malaria parasite in blood by thin or other enrichment technology.

* A phase of brain

Abnormalities of the spinal cephalo series: the c.s.f. (cerebrospinal fluid) meaning of the acronym? is clear but high strung, containing 20 500 cells / mm² phagocytoses.

1.4. Treatment

The treatment depends on the type of infection and the stage of the infection. Several drugs, anti-protozoan flagellates are

available [7, 8, 9-10].

To deal with the early stages of human trypanosomiasis *Trypanosoma brucei gambiense*, lomidine pentamidine and suramin sodium. It is effective only in the lymphatic blood stage infection. Its can cause discomfort with sweating, abdominal pain; it is administered by intramuscular route every other day to see every day for six weeks. Suramin sodium is active in phase lymphatic blood, it possesses a certain nephrotoxicity imposing a search proteinuria before each injection, it becomes infected intravenously.

For the treatment of the advanced stages of the disease when the nervous system is achieved in the treatment of *Trypanosoma brucei gambiense* and *Trypanosoma rhodensiense* admiring the melarsoprol arsobal is administered strictly intravenously, any leakage of liquid causes a pressure ulcer patients must be to young for 12 hours intolerance manifests to the third and fourth injection hyperthemia, nervous and digestive disorders.

For the treatment of human trypanosomiasis in later stages of *Trypanosoma brucei gambiense*: Eflornithine. This product is no longer available today. It is administered by infusion at 4 doses during 7 to 14 days.

1.5. Prophylaxis

It is the implementation of strict control measures, the glossine and the trypanosomiasis.

The control of the glossines in four levels:

Large scale use of insecticides; the creation of the barrier by clearing forests and scrub in order to protect the villagers and the improved genetic control regions, and regions with sterile male healthy and trapping by the use of biconiques CHARLES LAVAISSIERE traps which are impregnated with insecticides.

The fight against the trypanosomes:

Diagnosis and care of patients, to protect subjects and control the reservoirs of the virus, animals, and humans.

The prophylaxis was circulated and not the scourge out of central Africa [11-12]. Experience has shown that the failure in the application of the preventive measures was to ransom back the disease.

Finally, this control is carried out at international level with mobile teams, specialized screen patients' clinical and parasitological and initiate and control the outcome of therapeutic treatments.

2. Environment, Materials and Methods

2.1. Environment

The epidemiological data of African human trypanosomiasis (sleeping sickness) available in the services of the national program for the fight against African human trypanosomiasis were collected through the health areas in all the provinces of the vast territory of the Democratic Republic of Congo, which has an area of 2345000 km² with a

population of 11 provinces, and a density of 60 million. 21 inhabitants / km², 12 600 000 population and 2 462 831 population covered by the national program for the fight against African human trypanosomiasis.

2.2. Materiel

The realization of a need for material investigations consisted mainly of the annual reports of the national program for the fight against African human trypanosomiasis and the ministry of health in 2005. In these documents, we find all the information on the population of the provinces with: age, sex, the level of social and the development of human trypanosomiasis in the Democratic Republic of Congo, Africa [11, 13-14].

2.3. Methods

To collect the data necessary for the completion of our work, we have used the following methods:

a) The documentation allowed us to gather all the information of annual reports and new technologies to fight against African human trypanosomiasis.

b) The samples and the collection of data necessary for the achievement of the tables and figures.

c) Epidemiological surveillance data to calculate the rate of new cases per year, and the rate of infestation in the provinces, in order to better understand the evaluation item by item and understand the scientific, socio-economic, educational and epidemic of endemic on the various according to the segments of the population statistics.

In order to make better use of the data, the formulae:

$$T.I = \frac{N.C * 100}{P.T.Ex}$$

$$P.C = \frac{P.E * 100}{P.T.Ex}$$

3. Results

After investigation and observation, we present the results in the form of tables, graphs and a discussion for better understanding charts and graphs, here the legend of some abbreviations used:

T.I: Rate of infection

P.C: Population covered

N.C: New cas

N.E: Level of endemicity

Z.E: Epidemic area

P.E: Exposed population

Z.S.: Health area

Z.S.T.H.A: Area of health of human african trypanosomiasis (sleeping sickness)

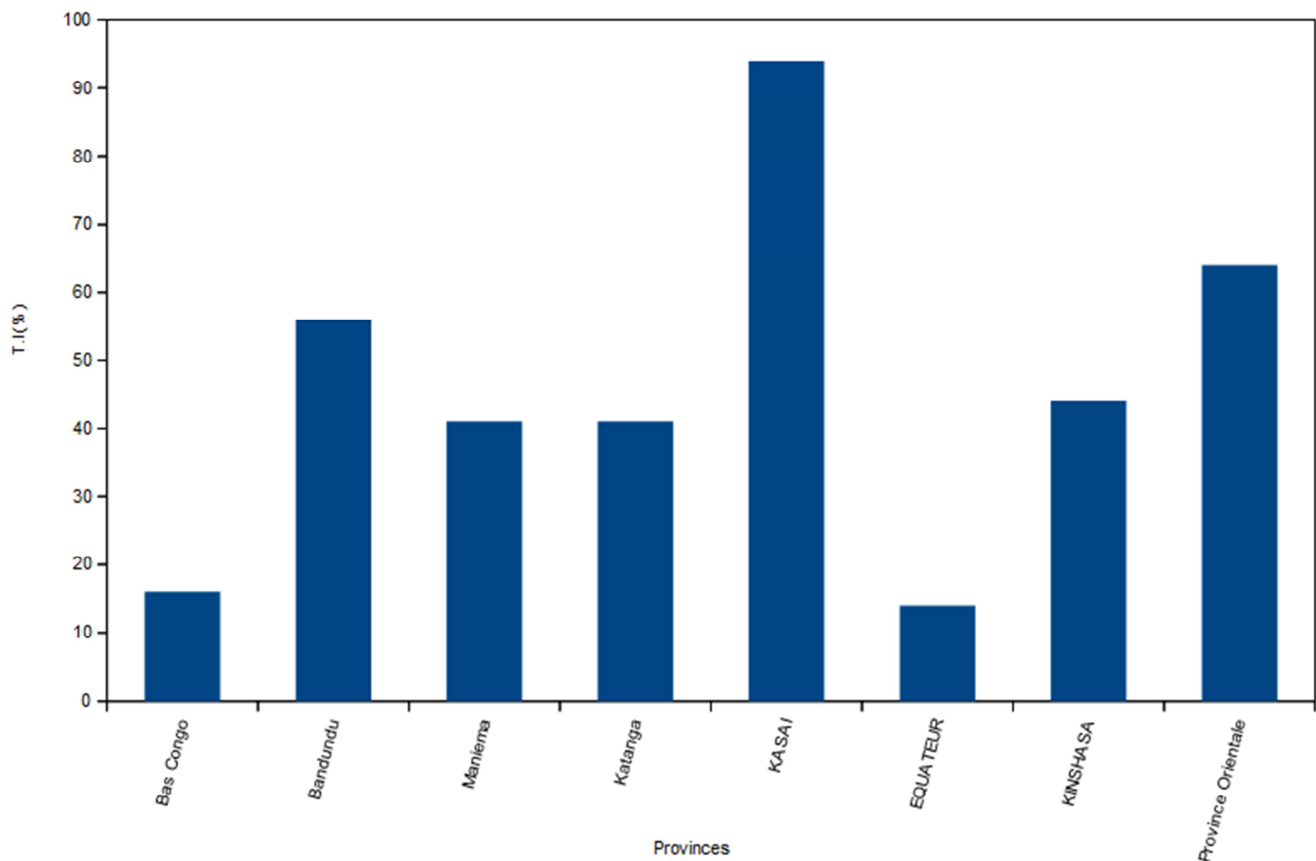
U.M: Mobile unit

P.T.R: Total population census

P.T.Ex: Total population is discussed

Table 1. State of the Human African Trypanosomiasis in Democratic Republic of the Congo in 2005.

ZE	PE	ZS	ZS THA	UM	PTR	PTE _x	PC	NC	T.I	NE
BAS CONGO	1700000	27	11	5	189275	173639	10,21	279	0,16	AVERAGE
BANDUNDU	3800000	38	31	13	1013455	819240	21,56	4621	0,56	SEVERE
MANIEMA ET KATANGA	1200000	81	16	4	174221	163352	13,61	667	0,41	AVERAGE
KASAI	2000000	58	35	15	286365	290114	14,51	2720	0,94	SEVERE
EQUATEUR	3000000	33	21	2	1019894	935926	31,20	1320	0,14	light
KINSHASA	6000000	22	8	1	47859	75578	12,60	331	0,44	AVERAGE
PROVINCE ORIENTALE	300000	47	3	3	64618	66822	22,27	431	0,64	SEVERE
TOTAL GENERAL	12600000	307	125	47	2795687	2524671	20,04	10369	0,41	AVERAGE

**Fig. 1.** State of the Human African Trypanosomiasis in Democratic Republic of the Congo in 2005.**Table 2.** Evolution of Human African Trypanosomiasis in 2005, depending on the circumstances and the stage of the disease.

Z E	Active testing				Passive testing				TOTAL NC
	first stage	second stage	unknown	TOTAL	first stage	second stage	unknown	TOT.	
BAS CONGO	43	27	0	70	20	116	0	136	206
BANDUNDU	1848	622	68	2538	1689	591	8	2288	4826
MANIEMA	167	26	3	196	59	28	0	87	283
KATANGA	16	29	2	47	55	6	0	61	108
KASAI ORIENTAL	407	417	50	874	1191	77	6	1274	2148
KASAI OCCIDENTAL	167	77	7	251	254	108	5	367	618
EQUATEUR	79	187	3	269	560	65	5	630	899
KINSHASA	22	20	10	52	191	13	8	212	264
PROVINCE ORIENTALE	440	185	0	625	130	123	1	254	879
TOTAL GENERAL	3189	1590	143	4922	4149	1127	33	5309	10231
%	64,8	32,3	2,9	48,1	78,1	21,2	0,7	51,89	

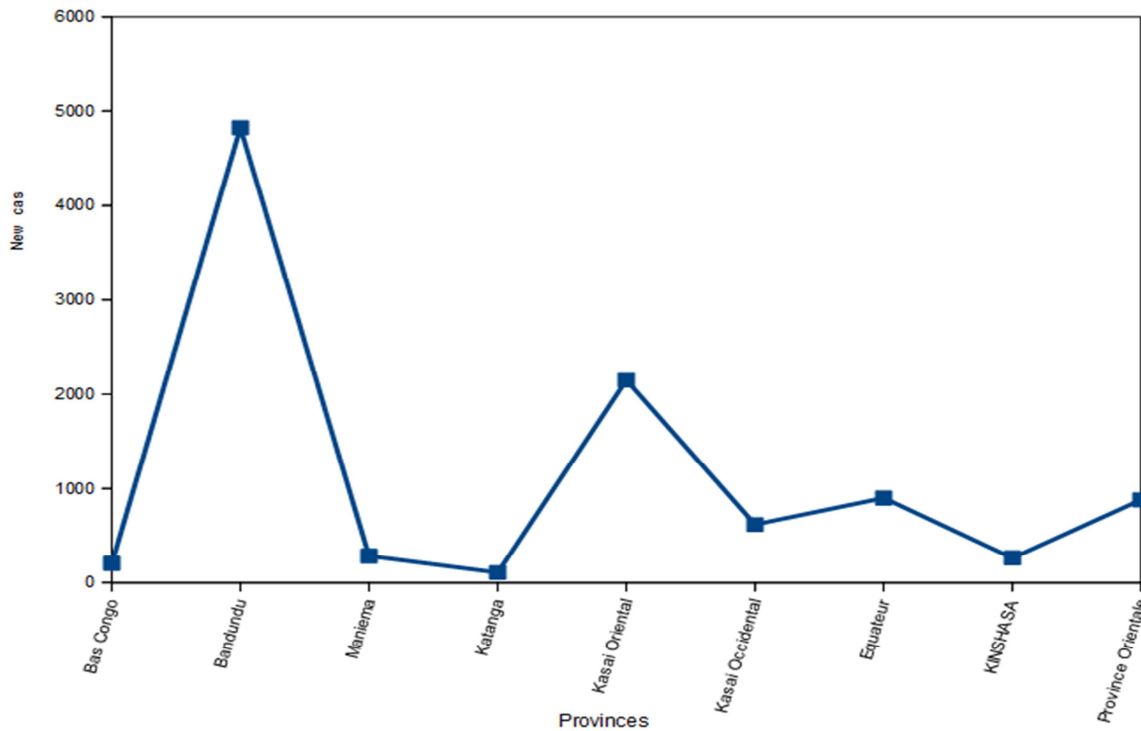


Fig. 2. Evolution of Human African Trypanosomiasis in 2005, depending on the circumstances and the stage of the disease.

Reading this chart, we observed that, during the year 2005, 10 231 new cases of African human trypanosomiasis were reported. In all endemic areas, 2 462 831 were examined. The average of the total population that is exposed is 9, 55% of the population. The overall infection rate was 0.42%.

The coverage of the population has reached about 20%. As a result, the number of people already infected at the moment is probably about 5 times higher, and in the absence of effective measures on a large enough scale, the transmission will increase significantly in the near future.

Bandundu is head of displays with 47% of the new cases in the whole country, Kasai oriental and eastern province 21% and 9%.

If the incidence of this disease is still insignificant, it should be emphasized that all patients do not show up in the screening centers either because they are unaware or shame or diversion by traditional healers and pastors that prophesy miracles cures.

Reading this chart, we observed that the 10 231 patients African human trypanosomiasis were reported during the year 2005, the agreement is 7338 cases (71, 72% in the first stage, lymphatic blood), 2717cases in the second stage (26.55% meningo encephalopathy), 176 cases (1,72%) about the diagnosis of stage n has not been made because the refusal of the lumbar puncture (no repeat, the pregnancy of the patient.

*Active detection is 48, 11 4922% thereof:

Table 3. Active testing.

First stade	Second stade	inconnu
3189	1590	143
64,8%	32,3%	2,9%

*Passive testing is 51,89 5309% thereof:

Table 4. Passive testing.

first stade	Second stade	inconnu
4149	1590	33
78,1%	21,2%	0,7%

These results confirm the presumptions of the program against human African trypanosomiasis on Advanced glossina, year by year to the center of life and therefore the emphasis means of health education of the population especially those living common peripherals and extension of the means of struggle.

4. Discussion

Throughout the Democratic Republic of Congo, the new endemic areas, we found that 12 600 000 people are exposed (23% of the country's population), 2 806 751 were from among those identified in 2005 and 2462831 were examined.

The population of 10 231 new cases representing 0, 42 of the national average. The results can be compared to those presented by the national program for the fight against African human trypanosomiasis until 2005, these services have been rising in all the endemic areas of work have been taken as a working model for the field of national program for the fight against African human trypanosomiasis [9, 10-11]. Also was identified by the national institute for scientific research of France and the institute of tropical medicine in Belgium on African human trypanosomiasis in west Africa, particularly in Burkina Faso and east Africa in Uganda is confirmed by the fact that the African human trypanosomiasis is evolving in the means of implementation the traffic and the screen [12].

The vegetation and climate of our country to create the

conditions for the proliferation of skin, as well as all provinces with the exception of the altitude are threatened by this disease, which is not dealt with in life, breaking the social and economic consequences that we know of.

5. Conclusion

The investigation on the problems of African human trypanosomiasis in the Democratic Republic of Congo was assigned as the first test of this condition through the different provinces, as long as the level of infection, and the new cases. Analysis of variance showed that there was an upward trend of the disease and the publications of the national program for the fight against African human trypanosomiasis supports [12].

Due to the vegetation and climate; the Democratic Republic of Congo has not only the conditions for the development of the agro pastoral sector but also the proliferation of large homes of the tsetse fly. and trypanosomes.

With the exception of a few areas across the country, with altitudes of fly vectors of trypanosomes causing skin, very serious damage to the health of the actors in the agricultural sector, but also their families, livestock and livestock in some provinces in trypano resistant animals.

The new cases detected are the effort of the hero in the shadows, and the extent of work if all households were under control.

The results of the national program for the fight against African human trypanosomiasis should address not only the government, but also the agencies involved in funding to help complete the work of its policy is to eradicate the African human trypanosomiasis, both at the level of the vehicle, the causative agent for the treatment and allow the population to return to normal social and economic life.

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