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Human Sleeping Sickness in the Gboko Endemic Area of Nigeria

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Abstract

Human infection with *Trypanosoma gambiense* in the Gboko endemic area was first reported in May, 1948 although *T. gambiense* sleeping sickness had been present there since the turn of the century. The disease is associated with the presence of the tsetse *Glossina tachinoides* and *Glossina palpalis* which is plentiful and widespread throughout the division as well as in thickets along the streams in the area. No successful attempt has been made to control the tsetse vector in the Division. The incidence and geographical distribution of cases of *T. gambiense* sleeping sickness in the Gboko area are described in this report. Cases were treated with Antrypol Tryparsamide mixture and Mel B. The highest number of cases of infection is usually picked up just before the start of the rains in early April. It is suggested that, for meaningful control of the disease a quick method should be devised to rid the area of the insect vector.

Introduction

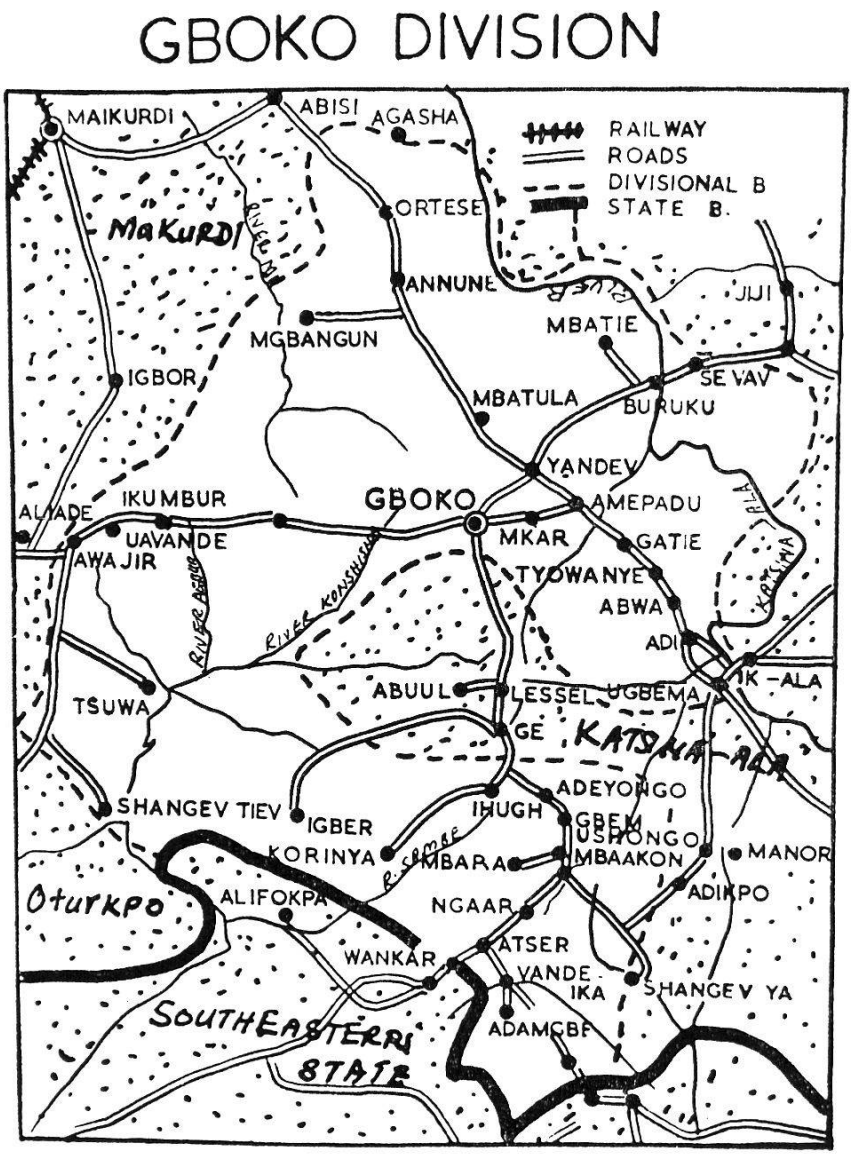
The former Tiv Division (see Fig. 1) remains an important endemic zone within Nigeria from where a significant number of sleeping sickness cases (many of them in advanced state) are being detected every year. The area lies immediately below the River Benue, South of Makurdi town.

The first case of *T. gambiense* infection in the Gboko endemic area was reported in May, 1948. There was an outbreak in the area at Raa'v in 1956. Since then the number of cases each year has been reducing gradually from about 376 cases in 1968 (percentage incidence of 0.19) (see Fig. 2). This probably resulted partly from increased surveillance, improved methods of diagnosis and general education among inhabitants on the facilities available for curing the disease. There has been practically no serious effort to control the tsetse vector.

This report briefly describes the incidence and geographical distribution of cases of Gambian sleeping sickness in the Gboko area of the Benue/Plateau State of Nigeria between 1968 and 1974.

Survey methods

The Institute is responsible for diagnosing, treating and finding methods of eradicating trypanosomiasis in Nigeria. Gboko Division has a population of roughly a million inhabitants. Our Gboko unit has well over 50 staff, comprising of Rural Health Inspectors, nurses, as well as Rural Health assistants. The institute covers these area annually by placing staff in all the dispensaries to treat all forms of ailments and detect sleeping sickness cases at Oturkpo (8°N 7°E), Aliade, Igbor, Makurdi (8°N 8°E), Gboko town (9°N 8°E), Katsina-ala (9°N 7°E), Buruku, and Ihugh (see Fig. 1). In these dispensaries, voluntary cases are mainly



treated and when the cases are advanced, they are referred to our retaining ward at Gboko.

Secondly, there are three established teams that carry out survey of villages in the Division annually to pick up the infected patients. The Gboko Division is usually divided into three areas and each team (comprising of at least 6–8 staff) move from village to village with the assistance of village heads and using census data, examine as many inhabitants as possible. The villagers are lined up and their cervical glands palpated and examined microscopically in the bush. When there is a swollen gland and trypanosomes are detected, the patients are separated for other tests like cell counts, IgM levels, protein values and antibody levels to confirm the infection.

These teams usually perform all their surveys in the months of November to April. During the rainy season, however, specific villages are picked and resurveys carried out.

Thirdly, the Institute has a Retaining Ward at Gboko town with 42 beds. A Nursing Surperintendent runs the ward with the assistance of some Rural Health Inspectors and other ward orderlines. Here all the advanced cases, mainly the Mel B. treatment cases are handled. The Institute also use the facilities at the

Table 1. Sleeping sickness cases diagnosed during surveys and treated in the Gboko Endemic area between 1968 and 1974

Year	No of people examined	Confirmed cases of S. S.	Percentage incidence
1968	196,967	376	0.19
1969	236,908	304	0.12
1970	319,865	252	0.07
1971	421,309	282	0.04
1972	408,444	161	0.03
1973	358,007	127	0.03
1974	391,350	132	0.03

Gboko Refuge where cases that need Antrypol Tryparsamide Melarsen mixture (ATM) are treated.

Results

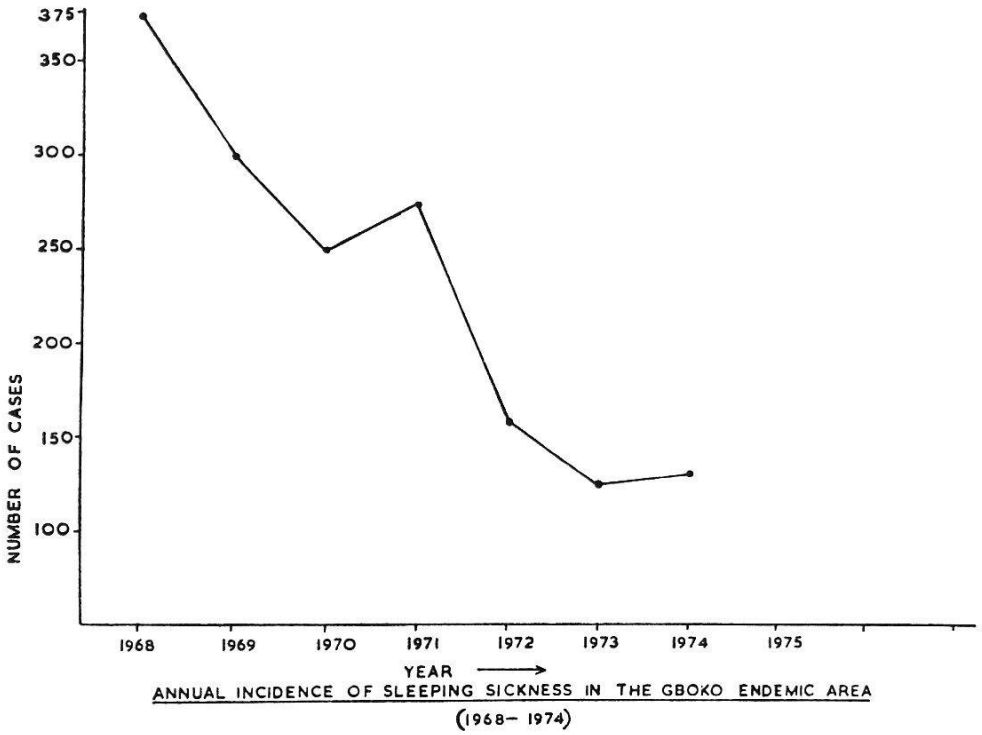
1. Cases diagnosed by survey

Details of cases diagnosed during initial and intensive surveys in the 3 survey areas are given in table 1 and Fig. 2 from where it is seen that the number of cases have gradually been reducing in number as can be seen from the percentage incidence (Fig. 3).

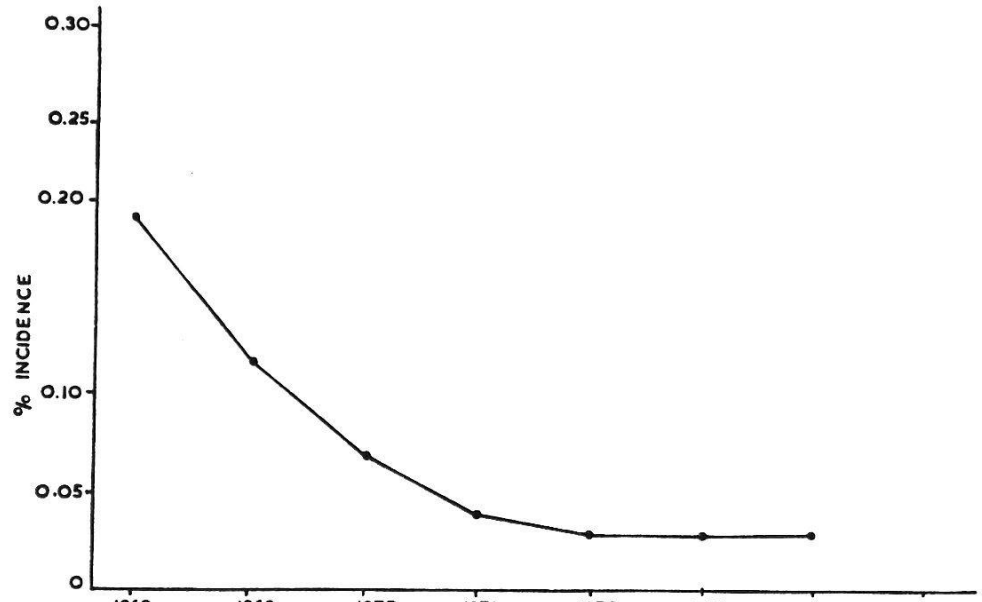
2. Volunteer sleeping sickness cases

The term 'volunteers' refers to those people who went to a fixed centre for examination and treatment when they felt unwell. Fixed centre included survey teams based in the dispensaries, our treatment centres and the Gboko Retaining ward. In these centres, trypanosomiasis were diagnosed by (a) examining the palpated cervical glands, (b) performing a lumbar puncture and examining the CSF fluid for trypanosomes directly and by triple centrifugation, (c) estimating the protein levels in the CSF, (d) counting the number of cells in the CSF, (e) estimating levels of IgM in CSF and in the sera, (f) performing the capillary-tube Agglutination (CA) test on the sera of the patients (AIYEDUN & AMODU, 1973), (g) in a few cases, cervical juice were inoculated into young nursling rats and parasitaemia checked in the rats.

A combination of positive results in the cases were used to assess the overall infection of the patients and thereby they were classified into early or advanced stages of the disease so as to be able to know the regimen of treatment needed for the infection (see tables 2, 3 and 4).



ANNUAL INCIDENCE OF SLEEPING SICKNESS IN THE GBOKO ENDEMIC AREA
(1968– 1974)



ANNUAL PERCENTAGE INCIDENCE OF SLEEPING SICKNESS IN THE GBOKO ENDEMIC AREA
(1968 – 1974)

3. Seasonal periodicity of sleeping sickness cases

There were two periods of high incidence, the greater in the end of March/early April while the smaller in December/January, these months

Table 2. Diagnosis of cases of sleeping sicknesss in volunteer patients in Gboko endemic area

Method of diagnosis	Positive test	Percentage %
Examination of wet blood film	2/76	2.5
Examination of stained blood film	3/76	4
Examination of glandular film	26/52	50
Cerebrospinal fluid examination	23/52	44
Animal inoculation tests using: glandular fluid	6/52	12.5
Animal inoculation tests using: Cerebrospinal fluid	8/52	15

Table 3. Sleeping sickness cases diagosed in 1972

	No of people examined	Percentage attendance	Positive trypanosome in gland juice	Clinical	Relapse	Total
1. Team surveys	154,505	80.91	30	1	–	31
2. Dispensary surveys	249,215	–	30	8	1	39
3. Voluntary cases	–	–	33	39	19	91
Grand totals	403,720	–	93	48	20	161

Table 4. Sleeping sickness cases diagnosed in 1973

	No of people examined	Percentage attendance	Positive trypanosome in gland juice	Clinical	Relapse	Total
1. Team surveys	108,942	86.96	40	1	–	41
2. Dispensary surveys	244,598	–	21	4	–	25
3. Voluntary cases	–	–	15	54	7	76
4. Survey of groups at special risk	4,467	99.61	–	1	–	1
Grand total	358,007	–	76	60	7	143

are both in the dry season when the weather is hot and dry. It appears, therefore, that there is a correlation between the susceptibility of the tsetse to trypanosomes and the higher temperature and drier conditions during the pupal period. It was assumed that with the onset of the rains, the flies dispersed from their breeding sites and come into contact with man.

4. The tsetse situation

Two tsetse species are involved in the transmission of sleeping sickness in Tiv division, namely *G. tachinoides* and *G. palpalis*. The primary habitats of *G. palpalis* appears to be the fringing vegetation of the many rivers and streams that traverse the area (see Fig. 1). The sleeping sickness is therefore transmitted by close personal man/fly contact along the rivers. The ecology of *G. tachinoides* is more complex with habitats in the fringing riverine vegetation and others in and around human and livestock dwelling places, establishing the peridomestic behaviour as described by BALDRY (1968). Attempts were made by the tsetse and trypanosomiasis Division (TTD) of the Federal Livestock Department to control the flies in 1968 but this proved a failure. Since then, they have never attempted to use any insecticide in the area. It is this inability to control the fly population in the area that is responsible for the cases of sleeping sickness in the Gboko Division.

5. Treatment of cases

Assessment of the stage of the disease was made by a cell count and an estimation of the protein of the cerebrospinal fluid obtained by lumbar puncture. The upper level of normality was taken as 3 cells/mm^3 and 26 mg of protein per 100 ml of CSF (WATSON, 1972). The choice of drug was made when this information was available. When both the cell count and the protein content of the CSF were normal and when illness was of less than 6 weeks duration, the drug of choice was Antrypol Tryparsamide mixture (ATM). When the CSF was abnormal in respect of either the cell count, high level of IgM or the protein content or when the illness has started to show clinical signs, the drug of choice was Mel B.

The courses of treatment used were as follows:

Antrypol Tryparsamide Mixture (ATM) – This drug consists of 0.5 g Antrypol and 1.5 g Tryparsamide dissolved in 10 ml of distilled water and given by the intravenous route. Day 1, test dose of 4 ml;

day 6, 10 ml; day 11, 10 ml and so on until 9 injections have been given to complete the course. This dose only reflects on the adult dose, i. e. adults weighing 50 kg or over.

Mel B – This drug is supplied as a 3.6% solution in 5 ml ampoules. The dosage is at the rate of 3.6 mg per kg body weight, but a 5 ml ampoule (which is the dose at the above rate for a 50 kg man) is required at the maximum dose for any single injection, usually in the morning before food. The course consists of 3 or 4 daily intravenous injections followed after an interval of 7–14 days by a second course. The first course, especially in severely ill cases may be reduced and 4 daily injections such as 2.5, 3.5 and 5 ml to a man of 50 kg or over. Since Mel B may cause renal damage, the urine should be examined for albumin before each injection.

Discussion

The Gboko division has continued to be a problem area in the fight against trypanosomiasis in Nigeria. Although there were localised foci of infection in the area, the cases generally occurred sporadically and were widely separated. Association by time and place between cases, if they occurred, were usually found towards the end of the dry season (before the first rains) when the incidence of the disease was highest, and were probably related more to tsetse conditions than to host factors.

It is evident that field survey teams have a useful practical value in finding sleeping sickness cases in the Division but by far the majority of cases has been detected by voluntary cases either to the local dispensary or to our Retaining ward at Gboko town itself (see tables 3 and 4). There is also an improved method of diagnosing, especially using the combination of the IgM levels with other tests such as the capillary-tube Agglutination (CA) tests, coupled with CSF examination for cells and protein content.

The number of diagnosed cases will probably not reduce in the forseeable future unless a quick method is devised to rid the area of the insect vector. This should be coupled with constant surveillance and the establishment of a few fixed diagnostic and treatment centres in the Division.

Acknowledgements

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