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Sleeping Sickness in Children

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SUMMARY

Twenty-three cases of Sleeping Sickness in children have been analysed at the Arthur Davison Hospital and Mukinge Hospital during the past five years. The overall mortality was 34.8%. This was especially high when trypanosomes were found in the CSF (43.8%), in patients with a CSF cell count greater than 101/cumm (50.0%), and in patients with associated protein calorie malnutrition (PCM) (30.0%). Some clinical features of sleeping sickness (SS) in children are discussed and the therapeutic approach reviewed. The importance of early diagnosis is stressed.

INTRODUCTION

The editorial letter of the Medical Journal of Zambia, Vol. 6, No. 2 indicates a sharp increase in the incidence of Sleeping Sickness (SS) in Zambia. Buyst's recent paper (Buyst, 1974) further emphasizes this trend. His findings also indicate a higher incidence of SS in children than is expected. The clinical picture and some epidemiological aspects of SS in Zambia have been the subjects receiving most attention during recent year (Buyst 1970, Deckelbaum and Lowenthal 1970, Foulkes 1970, Buyst 1974). The major emphasis has usually been given to SS in adults, with less attention given to SS in children. We would like to complement these prior studies by focussing upon the age group below 14 years and analysing SS cases in this group.

MATERIAL AND METHODS

During the past five years 23 children were admitted and treated for SS in the Arthur Davison Hospital (ADH) in Ndola, and Mukinge Hospital (MH) in Kasempa District. The Arthur Davison Hospital is the only special children's hospital in Zambia. It serves not only the large urban and surrounding area of Ndola (Copperbelt Province), but also is a reference centre for some other hospitals from the Copperbelt and Luapula Provinces, and for hospitals and clinics supervised by the Zambia Flying Doctor Service (ZFDS). This means that we receive patients from an area covering more than half of Zambia.

The Mukinge Hospital is established and located in the centre of a well known endemic SS area in the North-Western Province of Zambia.

The patients studies underwent routine clinical and laboratory examination and treatment, with no original intention of publishing the results. The diagnoses were made on the basis of the clinical picture and confirmed by microscopic findings of the Trypanonsomes either in the blood or in the cerebrospinal fluid (CSF), or both.

RESULTS

All 23 diagnosed cases were African children. The two youngest patients were 8 months old; the oldest was 13 years. Eleven were males and twelve were females. The district from which the children were referred or where they resided for a brief time prior to contracting their illness were as follows: Kasempa with 13, Serenje 3, Petauke 2, and Isoka, Kabompo, Lundazi, Luwingu Solwezi with one each. SS was diagnosed during January 4 times, in February 2, in March 2, in April 2, in May 3, in July 2, in August 4, and in September 4 times.

Seven patients were referred to us by ZFDS from its various clinics, 4 patients from different Rural Health Centres, 2 cases from District Hospitals and 10 patients attended our outpatient departments. The history of the duration of the illness given by the parents or relatives was between one week and three months. Only two patients were referred with diagnosed SS. Six were referred or admitted as malaria patients, three as pyogenic meningitis, three for dullness and lethargy, and the others for various diagnoses or complaints as shown in Table 2. The final diagnosis in 17 cases was made within 96 hours of admission.

In 4 cases the diagnosis was delayed because 2–3 blood smears and the first CSF were negative for trypanosomes. The clinical findings are summarised in Table 3.

Lumbar puncture was performed on all the patients, but laboratory results are available from only 22 of them. Of these only one CSF was normal. Fifteen children were severely anaemic. Trypanosomes in CSF were found in 16 cases. The results of some laboratory findings are shown in Table 4.

SS was associated with other diseases in 20 (87%): anaemia, hookworm infestation, brochopneumonia, malnutrition, gastroenteritis etc.

On confirmation of the diagnosis, treatment with Antrypol and Mel B was started immediately Out of 23 patients 8 died (34.8%), one recovered with severe sequelae and 13 recovered fully. One relapse, successfully treated, was noted. The duration of hospitalization ranged from 27 to 92 days with an average of 54.8 days (excluding one case which was associated with pulmonary tuberculosis and required hospitalization for 215 days).

TABLE I

PATIENTS WITH TRYPANOSOMIASIS DIAGNOSED IN THE LAST FIVE YEARS.

	Name	Age	Sex	District	Season
1.	Ch.A.	10yrs	F	Petauke	August
2.	E. E.	9yrs	M	Kasempa	April
3.	A. K.	3yrs	F	Serenje	September
4.	M. M.	8 mths	M	Isoka	July
5.	M.S.	5 yrs	F	Luwingu	May
6.	K. L.	12 yrs	M	Kabompo	April
7.	Ch.B.	18 mths	M	Serenje	January
8.	D. J.	8 mths	F	Petauke	September
9.	M. A.	3 yrs	F	Serenje	September
10.	S.M.	11 yrs	M	Lundazi	July
11.	F.M.	6 yrs	M	Kasempa	January
12.	L.B.	6 yrs	F	Kasempa	February
13.	R.J.	4 yrs	F	Kasempa	March
14.	N. T.	4 yrs	M	Kasempa	May
15.	A.B.	18 mths	F	Kasempa	August
16.	F.J.	13 yrs	F	Kasempa	January
17.	F.J.	9 yrs	M	Kasempa	August
18.	S.L.	12 yrs	F	Kasempa	February
19.	E.E.	7 yrs	F	Kasempa	January
20.	H.L.	18 mths	F	Kasempa	May
21.	K.K.	4 yrs	M	Kasempa	March
22.	Ch.K.	10 yrs	M	Solwezi	August
23.	B.K.	9 yrs	M	Kasempa	September

yrs = years
mths = months

DISCUSSION

The incidence of SS in children varies from endemic area to endemic area. It usually depends upon the exposure of families to tsetse fly within or very near their villages. Buyst (1970) found that out of 50 cases 6% were in the 1–12 year age group. Neves (1971) found 9.3% in the 1–15 year group out of 4,217 cases in Eastern Africa. Jelliffee (1970) cites an epidemic where out of 100 cases of SS 28% were children. In another study Buyst (1974) found out of 166 diagnosed cases of SS in the Isoka District 28 (16.8%) were children.

In recent years epidemic conditions have developed in some areas of Zambia (Buyst, 1974) while the endemic conditions have persisted in many other areas. One of the hospitals (MH) is located in an endemic zone and has treated 50–90 patients for SS each year for nearly two decades. Yet out of these only 13 children during the past five years were treated for SS-an incidence of about 3%.

In our series we found 2 children as young as 8 months old and 10 in the 1–15 year age group. This is certainly the age group where often little thought is given to SS and when even mild infections of any type are accompanied by dullness and generalised symptoms.

Comparing the clinical pictures of SS in children with that of adults we found that the incidence of febrility, changes in consciousness (dullness and lethargy), positive meningeal signs, and anaemia were higher in children. Changes in walking and in speech are difficult to compare, and findings of splenomegaly or hepatomegaly are difficult to relate solely to to SS. The incidence of the other signs and complications are similar to those in adults.

TABLE II

DIAGNOSIS AND THE OUTCOME OF PATIENTS WITH TRYPANOSOMIASIS

	Length of the history.	Provisional diagnosis	Day of the final	Outcome (on the day)	Associated diseases
1.	1 w	Malaria P.C.M.	1	Died (11)	Malaria Schistosomiasis Anaemia P.C.M.
2.	2 m	Trypanoso-miasis		Died (12)	Bronchopneumonia
3.	?	Malaria Anaemia	17	Died (17)	Anaemia P.C.M.
4.	1 m	Gastroenteritis Anaemia P.C.M.	2	Died (30)	Gastroenteritis Anaemia Bronchopneumonia
5.	2 w	P.U.O.	6.	Died (7)	–
6.	2 w	Malaria Gastroenteritis	4	Recov. (51)	Bronchopneumonia Gastroentheritis Anaemia
7.	1 w	Pyog. meningitis	2.	Died (2)	P.C.M.
8.	1 w	Pyog. Meningitis	4.	Recov (215)	Measles P.T.B. Cellulitis
9.	?	Malaria	3.	Recov. (55)	Anaemia
10.	2 m	Abdominal pains	2.	Recov. (42)	–
11.	2 m	Unable to walk Lethargic	1.	Relaps-Recov. (53 + 39)	-
12.	4 w	Lethargic	1.	Recov. (82)	Broncopneumonia Hookworm inf. Gastroenteritis Stomatitis
13.	2m	Post measles debilitation	7.	Died (11)	P.C.M. Gastroentheritis.
14.	2 m	Lethargic	1.	Recov. (69)	Hookworm inf.
15.	1 d	Pyog. Meningitis	1	Recov. (61) sequelae)	Bronchopneumonia Hookworm inf. P.C.M.

Continued

TABLE II (Continued)

	Length of the History	Provisional diagnosis	Day of the the final diagnosis	Outcome (on the day)	Associated diseases
16.	?	Chest infection Trypanosomiasis		Recov. (37)	Bronchopneumonia Anaemia
17.	2 m	Malaria Anaemia	9.	Recov. (57)	Schistosomiasis
18.	2 m	Malaria	1.	Recov. (43)	Hookworm inf. Anaemia
19.	3 m	General malais	1.	Recov. (38)	Hookworm inf. Anaemia
20.	?	Dyspnoea	1.	Died (8)	Enterobiasis Anaemia
21.	?	Anaemia	1.	Recov. (54)	Hookworm inf. Strongyloidosis Anaemia
22.	3 m	Vague illness	1.	Recov. (45)	Hookworm inf. Anaemia
23.	?	Adenopathy	4.	Recov. (42)	Hookworm inf.

d = days
w = weeks
m = months

TABLE III

SYMPTOMS AND CLINICAL SIGNS IN 23 SS CHILDREN

Fever (100°F)	69.5%
Anaemia (Hb below 60%)	63.6%
Dullness and lethargy	47.8%
Lymphadenopathy	49.1%
Positive meningeal signs	34.7%
Splenomegaly	34.0%
Pallor	30.4%
Change in gait	28.5%
Respiratory distress	26.1%
Hepatomegaly	21.7%
Diarrhoea	17.4%
Semicoma	17.4%
Tremor	13.4%
Hyperreflexia	13.0%
Changes in speech (in children over 3 years of age)	10.0%
Swollen face	8.7%
Jaundice	4.3%
Tender abdomen	4.3%

The recommended schedule of treatment of SS is Suramin (Antrypol, Bayer 205) in the early stages, followed by Melarsoprol (Mel B. Arsobal) in patients with involvement of the central nervous sytem. The recommended scheme is according to Buyst (1970) Foulkes (1970) and Jelliffe (1970): Antrypol 10–20 mgs/kg given i.v. on days 1, 3 and 5. Mel B is given in increasing doses of 3.6 mg/kg as follows:

Days:	7	8	9	17	18	19	27	28	29	37	38	39
Mel B:	1	2	3	4	5	5	5	7	9	10	10	10
	10	10	10	10	10	10	10	10	10	10	10	10

Because all cases except one showed CNS involvement, the above Antrypol and Mel B treatment schedule, with occasional slight modifications, was established.

The mortality rate in our series was 34.8% Mortality was especially high among children found to have trypanosomes in the CSF (43.8%), while in absence of CSF trypanosomes, mortality rate was only 16.7%. Similarly in patients with more than

TABLE IV

SOME LABORATORY FINDINGS IN 23 SS CHILDREN IN RELATION TO THE FATAL OUTCOME

		Number of Patients	Death	Remarks
Hemoglobin :	below 40%	4	3	
	41% – 60%	11	2	
	more than 61%	8	3	
	Cerebrospinal fluid (results available from 22 patients):			
Cell count:	less than 5/cmm.	1	1	
	6 – 100/cmm	11	2	
	101–500/cmm	7	4	one relaps and one with sequels
	more than 501/cmm.	3	1	
	Proteins on CSF (quantitatively examined in 14 patients):			
	below 25mg%	1	1	
	26 – 40mg%	3	2	
	41 – 100 mg%	4	1	
	more than 101 mg%	6	4	
	Positive finding of the Trypanosomas in the:			
	blood smear only	6	1	
	cerebrospinal fluid only	9	4	one relaps and one with sequelae
	in both	8	3	

101/cumm CSF while cell count, the mortality rate reached 50.0% in comparison with 25.0% in those with the cell count less than 100/cumm. The overall mortality rate in our series is considered high. However, in cases No. 3, 5, 7 and 13 the general condition of the patients on the day of the diagnosis had deteriorated so much that the downward course of the disease could not be checked. The other 19 patients received the treatment outlined above without too much hazard. Out of these 4 died (21.0%). It is noteworthy that all these four had other serious complications: bronchopneumonia, malaria, and protein-calorimalnutrition (PCM). The factor contributing most of these fatalities was PCM. Out of 5 SS patients with associated PCM, 4 died (80%).

The mortality rate in adults is much lower, but there are also marked differences. Common to all patients in Zambia T. rhodesiense, which is more virulent than the West African T. gambiense variety. Recent preliminary studies on T. rhodesiense strains from Zambian (Ormerod 1975) seem further to confirm the virulence of the T. rhodesiense strains found here. Others have reported a more severe course in patients from the non-endemic areas than those from endemic ones; (Cohen, 1973, Buyst, 1974), and more severe in Europeans than in Africans (Decklbaum and Lowenthal, 1970). It has been suggested that the the milder course of the disease may be explained as a result of natural selection of the inhabitants of endemic areas (Buyst, 1974), and more severe in Europeans than in Africans (Decklbaum and Lowenthal, 1970). It has been suggested that the milder course of the disease may be explained as a result of natural selection of the inhabitants of endemic areas (Buyst, 1974); or could be related to some degree of acquired immunity of adult Africans in those areas (Blair, 1968). Children, like adult patients from non-endemic areas, seem to have little or no immune response to the trypanosome. Furthermore, malnutrition, and other concomitant disease in children lower their resistance further. The probability of a delay in the diagnosis of SS in children may be extended even longer because of failure to observe the early signs by the parents. Among the very young children the disease is particularly typical and often associated with multiple infections. These factors may lead to considerable delays in reaching the correct diagnosis. Further, the rarity of SS in children in endemic areas also

contributes to its being missed. In Zambia any child with central nervous system symptoms deserves a brief historical inquiry into tsetse fly exposure and possibly a blood smear and CSF evaluation to detect trypanosomes.

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Nutrition Rehabilitation in Lusaka

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SUMMARY

The incidence and present modes of management of malnutrition in the country are first discussed, and the idea of rehabilitation village, where the mother learns in a practical way about child feeding, is described. Details of the Chipata centre are given and it is recommended that these centres should be established on a wider scale.

INTRODUCTION

Perhaps because malnutrition is to such a large extent a social disease it seems to excite much less concern among doctors in Zambia than many less serious conditions. This partly reflects the lack of interest of many medical officers in paediatrics, at least those in out-stations; and to me indicates the necessity of an orientation course for doctors and

TABLE I

INCIDENCE OF MALNUTRITION

Date	Place	Examination	Criteria	% of people
May, June 1971 (1)	Eastern Province	Weight	Under 70% of standard	28
May, June 1971 (1)	Eastern Province	Weight/height	Under 80% of standard	24
Nov., 1973 (2)	Villages near Chipata	Mid-arm circumference	Under 14 cms	18
Nov., 1973 (2)	Squatter compound, Chipata	Mid-arm circumference	Under 14 cms	30
Nov., 1973 (2)	Kapata township Chipata	Mid-arm circumference	Under 14 cms	26
June-Oct., 1973	Chipata Hospital Under fives clin.	Weight	Below lower line RtoH chart	15

1. National Food & Nutrition Commission Survey
2. Chipata Nutrition Group survey (children 1–5 years)

contributes to its being missed. In Zambia any child with central nervous system symptoms deserves a brief historical inquiry into tsetse fly exposure and possibly a blood smear and CSF evaluation to detect trypanosomes.

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