Medical Journal of Zambia, Volume 18, Number 1 January, 1984

RELAPSING FEVER IN SICHILI

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Summary

Between 1 December, 1982 and 30 November, 1983, 274 cases of tick borne relapsing fever were seen in Sichili. Mainly children were affected and the incidence was lower during the cold season.

Clinically, tick fever could not be differentiated from malaria and the diagnosis was based on the findig of borreliae in a thick blood film.

In general, the clinical course was mild and no fatal cases occurred. The most important complication was premature delivery with subsequent neonatal death.

Treatment with penicillin was found to be effective. From our experience, we noted several indications that tick fever could be more common in Zambia than is presently thought. A better awareness of the possible occurrence of the disease is warranted and may lead to an increasing number of reported cases.

Introduction

Sichili is situated in the northern half of Sesheke District, Western Province. The catchment area of Sichili Mission Hospital has a typical rural character, is poor and thinly populated (less than 2 per square km.). Most people live in earthen-floored mud huts with thatched roofs.

The hospital has 120 beds. The number of new out-patient attendances in 1983 was 14,201 (50 per day) and 2,275 people were admitted.

The arrival of a new binocular microscope in October, 1982 enabled us to introduce routine examination of blood smears into the management of patients with pyrexia. Much to our surprise, one of the first blood smears examined showed spirochetes of the genus Borrelia. Thus, the first diagnosis of relapsing fever in Sichili was established. Afterwards, we learned that tick fever was well known in Sichili in the 1950's. The Mission sisters of that time based their diagnosis on the typical relapsing febrile attacks of the patients. Strangely enough, this knowledge was lost in subsequent years.

In the following months and up to this time, many more cases were seen. All this was quite surprising because relapsing fever was not known to us as being a common disease in Zambia. This paper is an account of one year of experience with relapsing fever in Sichili.

Material & Methods

The information we could get about the occurrence of relapsing fever in Zambia was very fragmentary and mainly obtained through personal communication with colleagues.

- —In 1978, 6 cases of louse borne relapsing fever were notified in all Zambia.
- —The Ministry of Health annual report for 1978 shows that in-patient returns for all Zambia in that year totalled 113 cases of relapsing fever.
- —In 1979, Hira and Hussein reported in transmision of borrelia through blood transfusion in Zambia.
- —The last case of relapsing feve in Lewanika Hospital, Mongu was diagnosed in 1980.
- —Relapsing fever was not known to occur in Sesheke Boma until 4 months ago.
- —Borrelia is regularly found in Senanga Hospital:
  1980 — 2 cases
  1981 — 4 cases
  1982 — 2 cases
  1983 — 34 cases
- —Cases fo relapsing fever are frequently seen in Kasaba Mission Hospital in Luapula Province.
- —Furthermore, I was informed that the disease was not diagnosed recently anywhere else in the Western Province, Livingstone (the nearest big town to Sichili at 250 Km), Northern Province,

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Lusaka or Mwachisompola.

Also quite significant is the fact that the Laboratory Handbook of the School of Medicine and University Teaching Hospital does not mention Borrelia Duttoni among the possible findings on examination of a thick blood film.

Relapsing fever in Sichili

a) **Laboratory diagnosis.**
Thick blood films are taken routinely from all patients presenting with fever. The films are stained for 30 minutes with Giemsa, diluted 1 in 10.

The borreliae are easily seen with a 100x immersion objective, although sometimes a slide needs to be examined for several minutes before a spirochete is detected. In some cases, even repeated blood smears are negative.

The different species of Borrelia are morphologically indistinguishable but we can assume that the species found in our laboratory is Borrelia Duttoni. This is the causative organism of tick-borne relapsing fever in tropical Africa.

Four blood slides from Sichili were examined by the bacteriologist at the Tropical Diseases Research Centre in Ndola and were reported to contain spirochetes compatible with Borrelia Duttoni.

b) **"Tick fever".**
The crevices in the walls and floors of the native mud huts make an ideal habitat for ticks. On our request, several patients with relapsing fever collected ticks in their houses. They were identified as Ornithodorus Moubata.

(") The specific name in Silozi for Ornithodorus Moubata is "Ntambani". To the best of my knowledge, the local people do not associate this tick with relapsing fever.

This soft tick is the vector of Borrelia Duttoni and transmits relapsing fever.

Thus, we can reasonably assume that the relapsing fever occurring in Sichili is of the tick borne, endemic or sporadic variety, as opposed to the epidemic form which is caused by Borrelia Recurrentis and transmitted by lice.

c) **Incidence and time distribution.**
Between 1 December, 1982 and 30 November, 1983, 274 proven cases of relapsing fever were recorded in Sichili.

During the same period, 1,445 blood smears were found positive for malaria parasites. Thus, for every 5 cases of malaria, we see one patient with Borreliosis.

The incidence is noticeably lower during the cold months, June, July and August. The greater incidence in the warmer seasons has been reported in several previous studies about tick fever in Africa.

d) **Sex and age distribution. (TABLE 1)**

The greater number of cases (62.8%) occurred in children under 14 years. A similar age distribution is found in the 113 cases of relapsing fever in the 1978 annual report of the Ministry of Health (61% under 14 years). Also Southern and Sanford (1969) noticed a majority of cases under 20 years in their review of 1,105

TABLE 1

	All ages	Under 1 year	1-14 years	Over 14 years	Age unknown
Male	110 (40.1%)	14 (5.1%)	61 (22.3%)	32 (11.6%)	3
Female	161 (58.7%)	10 (3.6%)	87 (31.4%)	59 (21.5%)	5
sex unknown	3				
Total	274 (100%)	24	148	91	8

cases of tick fever.

Our series shows a predominance of females, particularly in the adult group.

e) Relapses.

The total number of 274 cases includes 23 patients who had tick fever for the second time since November, 1982.

One boy had 3 attacks within 30 days. It is not possible to ascertain whether these patients had been reinfected or suffered from a relapse of the original infection, although the length of time between first and second diagnosis can give a clue. In 14 cases, the second febrile attack took place within 1 month after the primary attack. In 9 other cases, 1 to 6 months elapsed between the two positive blood smears.

f) Clinical picture. (TABLE 2)

A sudden high fever was the dominant symptom in all patients. Other common complaints were headache, abdominal pains, respiratory problems (cough, chest-pain, dyspnoea), neckache, backache, bone and muscle pains.

A summary of the clinical manifestations in 89 in-patients is given in the table below.

Apart from a raised temperature and concomitant pulse elevation, there were few abnormal physical findings.

Splenomegaly was found in 30 cases but this is not significant in an area where malaria is highly endemic.

TABLE 2
Clinical manifestations in 89 in-patients with tick fever.

Symptoms	Incidence	(%)	
Fever	89	(100)	
Headache	45	(50)	
Abdominal pains	18	(20)	
Respiratory symptoms	13	(14.5)	
Bone & muscle pain	14	(15.5)	
Backache	9	(10)	
Neckache	10	(11)	— 3 with real neck stiffness
Vomiting & nausea	4	(4.5)	
Epistaxis	4	(4.5)	
Jaundice	1		
Convulsions	1		

Right or left upper quadrant abdominal tenderness was an occasional finding, even in the absence of an enlarged liver or spleen. Three patients had a pronounced rigidity of the neck. In general, the clinical course was mild and complications rare. Four patients had nose bleeding.

A very ill 10 year old boy with jaundice and fever was admitted with the provisional diagnosis of viral hepatitis. A blood smear taken during a second febril attack 7 days later revealed borrelia. This boy also had convulsions.

No other neurological complications, indicative of CNS involvement were recorded.

The most important complication was premature delivery and subsequent early neonatal death. This was the final outcome in three of the eleven cases of tick fever during pregnancy, respectively at 21, 30 and 34 weeks. We could not prove transplacental infection of the neonates.

All patients recovered after institution of therapy.

g) Differential diagnosis.

"Malaria or tick fever" has become the most frequent differential diagnosis in the clinical practice in Sichili.

The clinical presentation is not very helpful in differentiating the two diseases, although neckache and a dry hot skin are more indicative of tick fever.

The typical temperature pattern of relapsing fever with recurring febrile attacks of 3 days, separated by afebrile periods of 7 days, is seldom of any use in establishing the diagnosis because most patients present during the initial febrile episode and others do not give a reliable history.

A history of antecedent tick bite is rarely obtained. In our experience, patients with fever and headache (and a negative or no blood smear), who do not improve on chloroquine are likely to have tick fever (rather than chloroquine resistant malaria). A repeat blood smear or a therapeutic trial with penicillin often confirms this.

Simultaneous infection with malaria and borrelia was recorded on four occasions. Of course, meningitis must be ruled out in patients with neck stiffness.

h) Treatment.

Tetracyclines are widely accepted as the

drug of choice for relapsing fever. However, short supply of this antibiotic in Sichili made us fall back on penicillin.

Adults were given a stat dose of 2cc (600,000 units) of procaine penicillin, followed by penicillin V 500mg four times a day for a week. Children were treated along the same lines with lower doses and babies got a 7-day course of procaine penicillin, ½cc daily.

With this treatment, the temperature came down and the general condition improved in all but a few cases.

A rise of temperature after the first dose of penicillin occurred in two patients and may have been due to a mild Jarish-Herxheimer reaction. No severe cases were seen of this type of reaction, which is known to occur frequently after the institution of antibiotic therapy with tetracyclines.

One disadvantage of our treatment scheme is it's failure to clear the infection completely in some cases, resulting in occasional relapses. Another shortcoming is the long duration of therapy which impairs the patient compliances, especially in out-patients. This in turn may have been responsible for some of the relapses.

Discussion

The high incidence of relapsing fever in the Sichili area evokes two questions:

1. Is this high incidence just a local problem?
2. If not, why is tick fever not more frequently reported from other hospitals?

There are several indications and recently some evidence that the answer to the first question is negative.

— Firstly, there is the geographical distribution of our patients. The majority of them was from Sichili or one of the nearby villages. 64 patients, however, came from more or less remote localities, some as far as 100km., from Sichili.

Tick fever occurred in places situated along the Sesheke-Koama road and also in Mulobezi, the biggest centre in our area and terminus of the railway from Livingstone.

— Not only local villagers became infected with Borrellia. A European nurse and a visitor from Italy got tick fever during their stay in Sichili although they only made occasional short visits to the villages.

— We have no information about the distribution of the soft tick Ornithodorus Moubata in Zambia but a suitable habitat is available throughout the country.

Even brick houses with concrete floors are not safe, as was illustrated by an outbreak of tick fever in the hospital compound.

— Since November, 1983, Borrelia Duttoni is regularly found in Sesheke.

In conclusion, we can reasonably assume that relapsing fever is more widespread than is generally believed at present. In particular, we think the disease must occur in the regions adjoining Sichili and Sesheke.

This is a serious assumption, as it implies that the diagnosis of tick fever is missed in some of these neighbouring areas. However, our experience in Sichili and the way Borreliosis was discovered in Sesheke, show clearly that tick fever can remain undiagnosed, especially if laboratory facilities are poor or if the laboratory staff does not positively search for Borreliae in blood smears.

In Sichili, the diagnosis of tick fever was not made, not even suspected until a new microscope made examination of blood smears possible. Alarmed by our experience in Sichili, the Doctors at Sesheke District Hospital prompted their laboratory assistants to keep Borrelia in mind when checking blood smears. Still, not one spirochete was found until, some weeks later, a medical officer examined some blood films himself and found four positives ones in a single morning! Since then Borrelia Duttoni is a common finding in the laboratory of Sesheke Hospital.

Similar problems of technical or human nature may also hinder the diagnosis of relapsing fever in other areas where the disease is not well known.

Finally, one can wonder whether we are dealing with a resurgence of relapsing fever in Zambia, after a long period of calm. P.G. Janssens (1982) has reported such a resurgence from Rwanda where tick fever was common in the first half of the 20th century, then became rare in the 1950's thanks to a malaria eradication campaign with Gammexane, an insecticide that is also active against ticks. Thus, the transmission of Borreliosis was interrupted. Since

systematic spraying with insecticides was neglected during subsequent years, the ticks progressively reappeared and tick fever with them.

We do not have sufficient information to prove a similar development in Zambia but the fact is that tick fever was well known in Sichili in the 1950's fell into oblivion thereafter. and is now again frequently diagnosed.

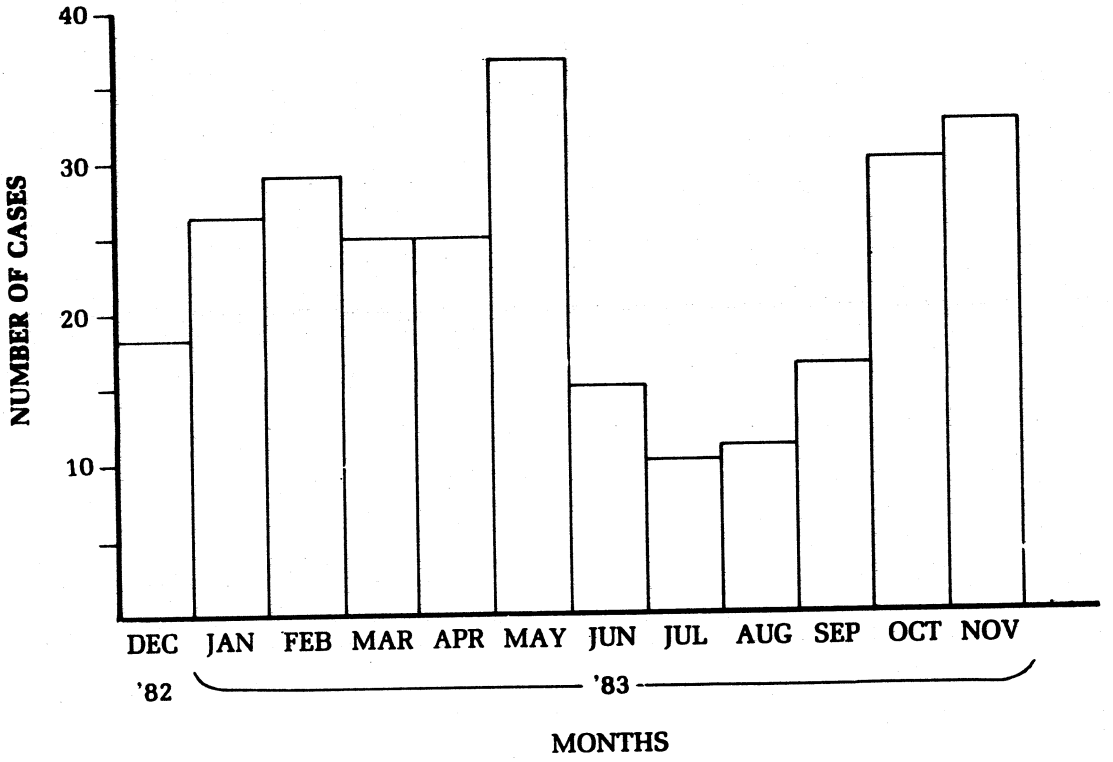

Fig. Monthly incidence of relapsing fever during the period of study.

Acknowledgements

I wish to thank Mr. Henry Maliwa, laboratory assistant at Sichili Mission Hospital, for making and examining so many bloodsmears. I would also like to thank my colleague, Dr. P. Lever, for his help in collecting the data.

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