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TECHNICAL DISCUSSIONS - SUB-COMMITTEE B

POLIOMYELITIS

OBSERVATIONS ON POLIOMYELITIS IN THE SUDAN

by

Dr. M.A. Haseeb
Stack Medical Research Laboratories, Khartoum

and

Dr. A.H. Halim
Khartoum Civil Hospital

1. INCIDENCE

Poliomyelitis is not a major public health problem in the Sudan at the present time. The observer may however see here and there old poliomyelitis cases indicated by paralysis and wasting of muscles of legs or arms in a few adults limping in the streets.

The first mention of poliomyelitis in the Annual Reports of the Sudan Medical Service was in 1951 when nineteen cases were recorded. Of the nineteen cases one was in Bahr El Ghazal, seven in Equatoria and eleven in Khartoum Province.

In that year studies in Khartoum were mainly clinical. It is very noticeable that paralysis of a leg often seems to follow a quinine injection whereas it is really due to poliomyelitis. Seven such cases were published by Coles and Findley (1953) bringing out this point clearly, which is of some interest in view of the alleged association between poliomyelitis and inoculation against diphtheria and pertussis in Great Britain (Medical Research Council 1956).

In 1952-53 Annual Report, ten acute cases of poliomyelitis were recorded as admitted to various hospitals. Eight of them were reported from Akobo, Upper Nile Province, during the months of May and June 1952. Four of these cases were among the European residents and four among the Nilotics.

The age incidence ranged from one and a half to seven years. One European and one Nilotic died of ascending bulbar paralysis, two Nilotics developed paralysis of one leg but the rest of the cases made complete recovery. In 1953-54 Annual Report, two cases in Khartoum, one case in Darfur, one case in Equatoria and one case in the Northern Province were recorded. In 1954-55 Annual Report, a marked increase in the number of poliomyelitis cases admitted to hospital was noted. Of a total of ninety-nine cases, sixty-one were admitted to Khartoum Civil Hospital, twenty-six were reported in Kordofan alone. Whether this increase is real or only apparent remains to be seen.

2. SEROLOGICAL SURVEYS

Because of the cases at Akobo attention was drawn to poliomyelitis in the Southern Sudan. The Medical Officer at Akobo at that time reported as follows, "In my opinion the disease of poliomyelitis is endemic in the South of the Sudan. But because of the poor sanitation and hygienic conditions of the natives almost all are infected in childhood and become immune so that there is seldom an epidemic".

Sera were, therefore, collected from donors in the remote localities in the Upper Nile Province off the main lines of communication. These sera were collected at the request of Professor George W.A. Dick and were taken to America for testing. The sera have not yet been tested against Brundhilde and Leon types, but the record of the Lansing runs which were made on them was as follows :-

Results of the Lansing runs:

<u>Individual Serum No.</u>	LD 50
1	2.3
2	1.7
3	1.6
4	1.6
5	1.5
<u>Serum Pool</u>	LD 50
1-5	1.6
6-10	1.3
11-15	1.5
16-20	2.1
21-25	1.7
26-30	1.3

It is, therefore, obvious that all individual sera tested and all pools neutralized the Lansing virus (type 2) in significant amounts (Haseeb 1953).

A second survey was carried out (Haseeb 1959) on two groups of Sudanese children. One group consisted of forty-eight children from the rural regions of Kassala and the other group consisted of forty-six children from the urban area of Khartoum town. The children ranged in age from eighteen months to fourteen years. The sera were tested by Dr. J.H.S. Gear, Director of Research, Laboratories of the Poliomyelitis Research Foundation, South Africa for polio-virus anti-bodies. The results of the tests are tabulated below :-

<u>Type of Anti-body present</u>	<u>Rural Kassala children</u>	<u>Urban Khartoum children</u>
1 only	1	3
2 only	2	1
3 only	4	Nil
1 and 2	1	2
1 and 3	6	2
2 and 3	3	3
1,2 and 3	31	35
None detected	<u>Nil</u>	<u>Nil</u>
	48	46

It can be seen from the above results that all the sera collected from Kassala and Khartoum Children neutralized one, two or all three types of poliovirus.

Clinical Signs and Symptoms

The disease occurs in a sporadic manner throughout the year but has its heaviest incidence from the months of January to April. It attacks all ages with preference for the young.

Abortive Cases or Minor Illness

As the disease does not occur in epidemics little attention has been made to the abortive cases. Probably many such cases are mistaken for influenza, other minor respiratory diseases or even malaria.

Preparalytic or Non-paralytic Poliomyelitis

A few such cases are encountered. The condition is characterized by severe backache, headache, pain in the neck and limbs. The temperature usually ranges from 101° to 103° F. Signs suggestive of meningeal irritation may be observed. The cerebro-spinal fluid is usually clear, under slight pressure and contains about 50 mgm of protein per cent. and the leucocytes which are mostly lymphocytes are about 100 cells/c.m.m. On one occasion a patient developed ascending paralysis from legs to trunk, arms and respiratory

muscles. The patient eventually recovered with some residual weakness of the muscles of the lower limbs.

Paralytic Poliomyelitis

The spinal form is the commonest form seen in the Sudan. The patient is usually a child between the ages of one and five years. The usual history is paralysis of one leg following a quinine injection which has been given for treating a fever suspected of being malaria. The paralysis manifests itself two to ten days after the onset of the fever. One case is on record where an adult with slight temperature developed paralysis of one leg after lifting a car. A child of three years developed paralysis of one lower limb subsequent to a diphtheria, whooping cough and tetanus triple vaccine given intramuscularly in the thigh. The paralysis reached its maximum in two days and then gradually improved. The paralysis was of the flaccid lower motor neurone type with loss of muscle tone and voluntary power and wasting. The reflexes both deep and superficial were lost, but sensations intact. As a rule the paralysis improves, leaving behind some residual loss of power, wasting of muscles or even contractures.

The improvement of paralysis begins to show itself after the end of the first week, but no recovery of muscles is seen after the second month. The muscles usually then atrophy, growth is retarded and the limbs remain small. The tendon jerks tend to recur when the muscles start to recover.

The bulbar type of poliomyelitis is very rarely seen. Recently one such case was admitted to Khartoum Civil Hospital with paralysis of the muscles of deglutition and the larynx and died eventually from paralysis of the respiratory muscles.

3. DISCUSSION

There is now abundant evidence that poliomyelitis may occur in any country, for evidence of infection has been obtained wherever appropriate search has been made. The disease pattern is not, however, the same in all countries. Generally speaking, in the temperate zones, the disease occurs endemically with periodic epidemic increases. In tropical countries epidemics have been unusual but serological evidence has suggested that infection is actually widespread and that overt disease occurs chiefly in those under five years of age (Rhodes, A.J. and van Rooyen, C.E., 1958). However, epidemic poliomyelitis has recently become prevalent in a number of those so called underdeveloped tropical countries (Gear, J.H.S., 1957). For this reason and for the apparent increase of poliomyelitis as recorded in the recent annual reports of the Sudan Medical Services, attention has been paid to the subject. Because of

the lack of accurate medical statistics for the whole country resort was made to serological surveys (Haseeb, M.A., 1953 and 1959). All sera tested whether from children in urban or rural localities or from Nilotic adults neutralized poliovirus in significant amounts, indicating that the infection is wide-spread in the Sudan. The clinical signs, symptoms and outcome of infection are in conformity with those prevailing in other tropical countries where the infection occurs early in childhood between the age of one and five years. Paralysis is exceptionally rare and often follows a quinine intramuscular injection (Coles, W.F. and Findley, G.M., 1953).

Work on the isolation of the local strains of virus with the view of testing their virulence is indicated.

4. SUMMARY

1. Serological and clinical evidence indicates that poliomyelitis is endemic in the Sudan.

2. The infection occurs early in life.

3. Paralysis is exceptionally rare and often follows an irritant intramuscular injection e.g. quinine injection.

4. Mass immunization by vaccination is not indicated at the present time in the Sudan.

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