

## COMMUNICATIONS

### AN EPIDEMIC OF VIRUS DISEASE IN SOUTHERN PROVINCE, TANGANYIKA TERRITORY, IN 1952-53

#### I. Clinical Features

BY

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Dengue in epidemic form has been a relatively uncommon disease in eastern Africa. In Zanzibar, epidemics have been reported at intervals since 1870 (GODDING, 1890) and have been reported more recently in Portuguese East Africa (DE SOUSA, 1924), in Madagascar (CULLINAN, 1946), among troops in Ethiopia, Somalia, the Comoro Islands and Madagascar (McCARTHY and WILSON, 1948), in the Belgian Congo (REUL and EERAERTS, 1949) and in Ethiopia (BUCCO, 1950).

The epidemic to be described occurred on the Makonde Plateau in the Southern Province of Tanganyika. It was clinically indistinguishable from dengue, if allowance is made for the inherent variability of that disease. Dengue has not been reported from the area before and no inhabitant can remember a similar epidemic. Owing to the distinctive severity of the joint pains and the sudden onset a local name was rapidly applied; the disease became known as *chikungunya*, meaning — “that which bends up”.

An explosive outbreak of the disease was reported from several villages in October, 1952, but on detailed inquiry it became evident that a few villages had been infected during the previous months. The subsequent spread was rapid and it normally involved 60 to 80 per cent. of the population in each village within a period of 2 to 3 weeks of its starting there. In some groups of houses every inhabitant was infected. Sporadic cases would occur after the main invasion but these were usually modified and less severe in type. The spread appeared to be greater in the smaller units than in those larger settlements that had a better water supply. Towards its end the epidemic was not limited to the plateau but the spread round its base was slow and intermittent.

#### CLINICAL FEATURES

One hundred and fifteen patients were observed in hospital, and many others were seen in the villages.

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\*Thanks are due to Dr. W. H. R. Lumsden, who has helped in the preparation of this paper for publication.

*General.*

*Incubation period.* As deduced from several cases with only one contact with an infected village, the incubation period varied from 3 to 12 days.

*Onset.* This was typically sudden with no prodromal symptoms. The pain incapacitated some people within a few minutes, others within several hours.

*Temperature.* There was a rapid rise in temperature, occasionally with a rigor, to a

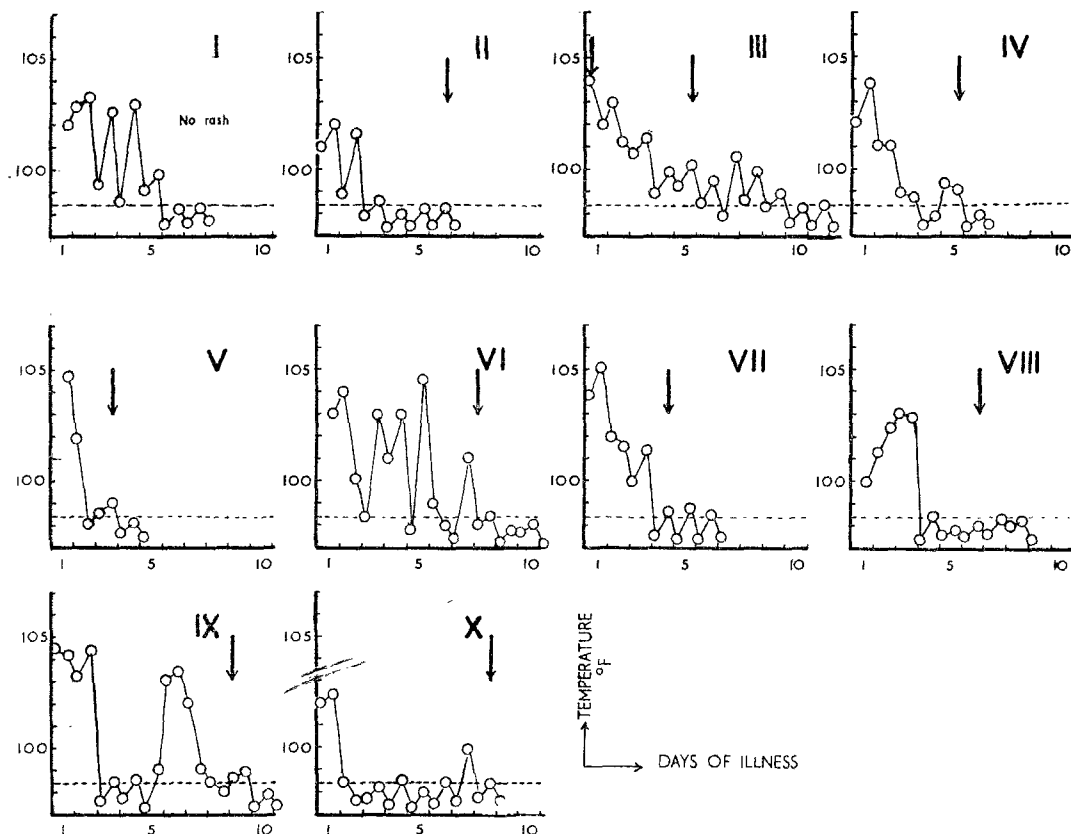


FIGURE. The temperature charts of 10 representative cases of dengue during the epidemic of 1952-53 in Newala District, Tanganyika. The arrow indicates the time of occurrence of the rash.

level varying from 102-105°F., usually high. The hyperpyrexia continued for a variable period of 1-6 days, and then after an apyrexial period of 1-3 days the majority of patients had a secondary rise of temperature of 99-101°F. This secondary rise was not constant and the type of variations in temperature chart are illustrated (Fig.).

*Joint pains.* The pain was frightening in its severity, completely immobilizing many patients and preventing sleep in the first few days of illness. It was intensified by movement and localized in the large joints. In some cases there was also severe backache. Morphia was the only analgesic which was found to modify the pain. In two cases the pain was mainly localized in a joint which had sustained a previous injury. There were usually no localizing

signs, but a hot and swollen joint was found in six cases : interphalangeal joint of finger, one ; knee, two ; ankle, two ; shoulder, one.

*Headache and eye symptoms.* Headache was often present, but was usually mentioned as a secondary consideration only. Postorbital pain and difficulty of eye movements were not mentioned. Suffusion of the eyes followed by a persistent conjunctivitis occurred occasionally.

*Rash.* There was an irritating maculo-papular eruption mainly on the trunk and extensor surfaces of the limbs. It usually accompanied or followed the secondary rise of temperature. In about 20 per cent. of patients there was no rash throughout the illness. In five cases a morbilliform rash appeared on the first day. The rash either faded or desquamated.

#### *Other findings.*

*Cardiovascular system.* There was a tachycardia in proportion to the initial rise of temperature and, in some cases, a bradycardia to 50 beats per minute in the second phase of the illness.

*Respiratory system.* No abnormality was detected.

*Central nervous system.* No abnormality was detected ; the cerebro-spinal fluid was not examined.

*Lymphatic system.* There was no general glandular enlargement or tenderness. Small palpable glands were discounted as they are so frequently found in Africans.

*Gastro-intestinal system.* Anorexia and constipation were usual. Vomiting and abdominal pain occurred in a few cases. Aphthous ulcers of the mouth were found towards the end of the illness in eight patients. Alteration in the sense of taste was not mentioned.

*Blood.* A leucopenia down to 4000-5000 white blood cells per c.mm. with a relative lymphocytosis was found in those patients who had no concomitant disease causing a leucocytosis.

*Urine.* A slight cloud of albumen was found in three patients.

#### *Late effects.*

Pyrexial recurrence of joint pains without other evidence of ill health occurred intermittently in the majority of patients, and in some continued up to 4 months after the original illness. These pains attacked different joints of the same patient at different times. They were usually very severe in the mornings, and would prevent the sufferer from changing position without help. In some districts the crippling effect of these pains was sufficient to endanger the normal agricultural programme.

Lassitude and depression followed the disease in a few cases only. Of the six Europeans affected it was only marked in one.

Residual oedema of the ankles was found in 12 patients ; none of them had previously had swollen ankles, nor had they any evidence of disease of the heart, kidney, blood or veins.

#### *Modifications.*

In seven cases the disease coincided with another febrile illness — bacillary dysentery in two patients, acute bronchitis in one, lobar pneumonia in one, and tonsillitis in three. Malaria, ancylostomiasis, septic lesions and gonorrhoea were coincidental in some cases.

In five patients the initial complaint was a sore throat and slight headache ; the joint pains occurred 2-3 days later.

At a later stage of the epidemic when the majority of a village had been infected, the disease appeared to be modified :—

- (a) The onset was less sudden.
- (b) The pain was less severe.
- (c) The duration was shorter.
- (d) The secondary rise of temperature and rash were less frequent.

No one was known to have a second attack. There was little difference in the three races affected ; Europeans, Asians and Africans were all attacked at different stages of the epidemic, and each race had representatives who suffered with different degrees of severity. The disease affected all ages equally in the acute stage. On the whole, children appeared to recover full health more quickly. No fatality was attributed to the epidemic.

The temperature charts of 10 representative cases are given in order to illustrate the variability of the disease (Fig.) : the criteria of diagnosis were :

- (a) Exposure to infection during the epidemic.
- (b) Absence of malaria parasites or other cause of fever.
- (c) Recovery without a specific drug.
- (d) Typical joint pains and, frequently, a rash.

#### DISCUSSION

The variation in clinical features corresponds with that stressed in other descriptions of dengue-like fevers in eastern Africa (McCARTHY and BRENT, 1943 ; McCARTHY and WILSON, 1948). The occurrence of milder cases, sometimes without a rash or secondary rise of temperature, towards the end of an epidemic, has also been recorded (CULLINAN, 1946 ; BUCCO, 1950) ; this divergence from type has been attributed either to modification of the infecting virus or to partial immunization of the population with heterologous strains. McCARTHY and WILSON (1948) state that a typical saddleback temperature was found in only 10 per cent. of their cases. Certain features, not usually associated with dengue, have also been described in other outbreaks—transient sore throat and coryza (DIASIO and RICHARDSON, 1944 ; FLEMING and FRENCH, 1947), vesicles and ulcers in the mouth (DIASIO and RICHARDSON, 1944 ; McCARTHY and WILSON, 1948), eye complications (MENJAUD, 1947) and a variety of debilitating sequelae (BIRKS, 1952).

The greatest differences in the clinical picture between this epidemic and most others lie in the absence of adenopathy, the frequent dissociation of the rash and the secondary rise of temperature, the lack of postorbital pain or pain on moving the eyes and the long continuance of the chronic joint pains. The picture of the epidemic, however, closely resembles that of an outbreak of dengue and the diagnosis is strengthened by its rapid spread amongst people who provide breeding places for very large numbers of the mosquito *Aedes aegypti* in their houses.

#### SUMMARY OF CONTENTS

An epidemic of a fever with most of the clinical characteristics of dengue is described from an area in which dengue had not been previously recognized.

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## APPENDIX

By the kindness of Dr. CARLOS MANUEL DOS SANTOS REIS, of Mocimboa da Praia, we can give the following information about the epidemic in that locality of Portuguese East Africa.

The epidemic in Mocimboa da Praia lasted from the beginning of April to the middle of May, 1953. It involved the native quarter of Pamunda and cases did not occur among Europeans except in those resident close to the African-occupied areas. Dr. REIS estimates from an interrogation of 338 Africans that 204 (60 per cent.) had been attacked in the epidemic. After the outbreak in Pamunda, the disease spread quickly to other coastal areas between the rivers Ruvuma and Messalo but the numbers of cases outside Mocimboa da Praia were small. Anti-mosquito measures were instituted in Mocimboa da Praia in April and cases ceased before 11th May.

Dr. REIS had experience of 70 cases including Europeans, Asians and Africans. In Europeans the onset of the disease was sudden with severe joint pains, intense headache, asthenia, photophobia, shivering and rise in temperature to between 39.3 and 40°C. (102.7 and 104°F.). Congestion of the face and mucous surfaces was present in most cases but was indefinite and fleeting. The period of remission was always short, never more than 2 days, and sometimes absent. The temperature fell and a "rubeoliform" rash appeared on or about the 4th or 5th day. Thereafter the patients were apyrexial.

In Africans the disease was difficult to follow as, in this epidemic, quite unusually, the native population avoided medical services, but as far as known the disease resembled the description of GELFAND (1948).

Convalescence was slow with prolonged anorexia and asthenia. The joint pains were slow to disappear; in two European women they lasted for 2 months after defervescence.

The severe joint pains, particularly affecting the knee and lumbosacral spine, were the most outstanding clinical characteristic in the epidemic. The affected joints were not oedematous; passive movements were painless but active movements were painful. The blood picture was one of leucopenia.

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