Clinical and Other Notes.

SCRUB TYPHUS IN MALAYA.

BY

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During the period October, 1945, to February, 1946, fifty-six (56) cases of scrub typhus (tsutsugamushi fever) were treated in a Military Hospital in Kuala Lumpur.

This area had long been known as a focus of infection and much of the research on all aspects of the subject has been carried out by Fletcher, Lesslar, Lewthwaite, Savoor and others working in the Medical Research Institute in Kuala Lumpur itself.

During the three and a half years of Japanese occupation a studied policy of neglect was maintained and gardening, agriculture, rubber planting and tin mining were at a standstill. Secondary scrub therefore appeared not only in the country but also in the towns and gardens and the rat population became substantially increased. Conditions were therefore ideal for an epidemic of the disease and doubtless but for the early adoption of anti-typhus measures the incidence of the disease would have been much greater.

Troops were employed in garrison duty and in clearing camp sites and later Dutch forces were in training in an area some few miles from the town. There were in all 56 cases, 17 European and 39 Indian; infection being acquired with one single exception from areas in and around Kuala Lumpur. The one case acquired outside was that of a Women's Services worker who had been resident in a bungalow on the outskirts of Singapore and infection was presumably acquired there.

CLINICAL FEATURES.

Prodromal Features.—These were not marked and constitutional disturbances apart from headache and malaise were slight. Two cases had noted the eschar and local adenitis and actually reported sick on this account alone.

The onset of fever was generally sudden and was accompanied by severe headache and by vague generalized body aches. The headache was for the most part frontal or occipital and seldom temporal. Vomiting was infrequent and in no case was there any severe intestinal disturbance. Patients who had previously suffered from dengue fever were convinced that this was the same disease.

Period after onset of symptoms before admission to hospital varied between
a few hours and nine days with an average of rather less than three days. It was noticeable that those who reported late were invariably less severe infections with a lower grade of fever. A certain number of low-grade fevers with few clinical signs and indefinite symptomatology were investigated as being possible abortive cases of scrub typhus but in no case was a Proteus OXK agglutination titre of significance obtained. Dr. Lewthwaite (personal communication) states that in his opinion abortive cases are so rare as to be almost non-existent.

The mental state was almost uniformly one of apathy and indifference. This was such a striking feature that a provisional diagnosis could almost be made on this alone. As the disease progressed so did the lethargy increase though seldom except in the fatal cases did this deepen into coma. During the terminal phase of the fever mental condition rapidly cleared and there was little tendency towards invalidism.

An eschar was seen in 16 cases, 6 European and 10 Indian, these having the following distribution: Neck 2, shoulders 3, axillae 4, chest 3, abdomen 2, groin 2, thigh 1.

One case (Indian) showed two typical eschars, one on shoulders and one on chest. Eschars were very characteristic, a central ulcer with surrounding zone of erythema later localizing to a circular black crust and leaving a depressed scar, in many cases still apparent after two months.

Rash was seldom well marked though it was seen in 11 European and 8 Indian—appearing between fourth and seventh days and fading within three days. Rash when present was most marked on trunk and shoulders and was of morbilliform or maculo-papular type.

Glandular enlargement in varying degree was almost uniformly present, glands being discrete, firm and tender and those draining primary eschar most prominent.

Deafness was not a feature and it was felt that the mental state of complete apathy accounted for what appeared to be failure of hearing and appreciation. Visual disturbances were not complained of, fundi were not routinely examined but in a few cases engorgement of retinal veins was apparent.

No cases at any stage of the illness showed “tender toes”—a finding stressed by American observers in North Burma.

A study of temperature charts revealed a common pattern but with many significant variations. Duration of fever was seven to twenty-three days with an average of 15·1 days. It was noted that the height of fever was not necessarily an index of the severity of the infection and in one case who remained comatose for three days fever ranged around 100° to 102° throughout. Severe cases often showed a sharp drop in temperature on or about twelfth day, this coinciding with a drop in blood-pressure and was followed by a departure from previous sustained fever to an irregular hectic fever.

A number of cases after being afebrile for two or three days had a transitory recurrence of fever up to 101° maintained for a few hours to three days. The significance of this was not apparent but it is of some interest that three of four cases of murine typhus occurring during the same period showed this secondary fever.
Clinical and Other Notes

Respiratory System.

Cough was a frequent complaint and in very many cases physical findings were scanty. Some 20 per cent of cases showed reddening of fauces which may well have accounted for the irritating dry cough. Rhonchi and fine basal creps were noted at some stage of the illness in the great majority of cases but only 25 per cent developed what could be termed a true bronchitis while broncho-pneumonia occurred in 7 cases. Sputum was generally mucoid becoming mucopurulent only when bronchitis was severe. Two cases showed blood tingeing of sputum with the development of bronchitis. One case following what appeared to be a localized pneumonic process in right lung developed a hæmorrhagic effusion. Aspirated fluid showed scanty polymorphs and lymphocytes in about equal numbers while fluid was sterile on culture.

Cardiovascular System.

Pulse-rate at onset of fever was generally around 80 per minute rising at about ninth day to 100 but showing marked variation with movement and any disturbance.

Blood-pressure was recorded daily and was found to fall steadily as the disease progressed. Readings of 90/50 were by no means uncommon around the twelfth day of illness, thereafter diastolic pressure rose steadily while systolic tended to remain low often until well on in convalescence.

That there is a considerable degree of myocardial toxæmia is evident in the extremely unstable pulse-rate and the falling blood-pressure. Clinical examination of heart, however, seldom showed more than a prolongation of first sound and a lack of definition. A typical chart showing relationship of fever, pulse and blood-pressure is given as Appendix I.

Spleen was palpable in 50 per cent of cases at the height of fever though seldom more than 1 F enlarged and not markedly tender.

Nervous System.

Mental state has already been commented upon.

Tremor of tongue was a very frequent feature and a certain number of cases showed fine fibrillary tremor of muscles of limbs. Reflexes tended to be sluggish—a feature noted often well on into convalescence.

Three cases during convalescence complained of paraesthesia of feet and this with reduction of reflexes suggested some degree of toxic peripheral neuritis.

Genito-Urinary System.

Urine examined daily showed a transient albuminuria only, while blood urea even in the most severe cases was found to be within normal limits. Estimation of urinary chlorides was found to be a very valuable guide in treatment as it proved fatally easy for chloride level to become dangerously low.

Mortality and Prognosis.

There were no deaths in the European cases but three Indians died. Of these two died with symptoms of intense cerebral toxæmia while the third presented the rather unusual feature of repeated hæmatemesis. At post-mortem gastric mucosa was intensely congested and covered with multiple hæmorrhagic
APPENDIX I.

A typical Chart showing relationship of fever, pulse and blood-pressure.
points, this process was confined to the gastric mucosa and apart from a few petechial pericardial haemorrhages no other abnormal naked-eye changes were noted.

The mortality rises sharply with age but as most cases were young healthy adults age proved of little significance in this series, two cases only being over 40 years of age. During the first week of illness it was difficult to judge of the probable severity of the infection but increasing mental disturbance particularly if accompanied by restlessness was of grave significance. A rising pulse-rate and falling blood-pressure confirmed a clinical impression that all was not well and this latterly came to be the basis of assessment for initiation of penicillin therapy as discussed later.

**Diagnosis.**

With the high incidence of eschars diagnosis was often made at time of first examination and seldom was any difficulty experienced in making an accurate clinical diagnosis within the first few days. In two cases only was the disease sufficiently atypical to depend for its diagnosis on the results of the Weil-Felix reaction.

Leucocyte counts were done on all cases and ranged between 3,600 and 11,400 with normal proportion of cells.

Weil-Felix agglutination reactions were carried out at intervals of about five days. Proteus OXK titres of diagnostic significance were reached any time between the eighth and eighteenth days, thereafter titre was generally found to fall fairly rapidly. The height of titre proved to bear little relationship to the severity of the disease and in two cases where the clinical diagnosis was not in doubt the highest Proteus OXK reading was 1/80. Accordingly it was considered that no diagnostic titre level could be fixed but in no other disease (except urban typhus) was significant OXK titre reached so that with readings of less than 1/160 the clinical diagnosis was not negatived and above that figure the diagnosis was confirmed.

**Differential Diagnosis.**

As already stated accurate clinical diagnosis was readily made and generally clinched by positive Weil-Felix reaction.

Two secondary syphilides with rash, enlarged glands and fever occurred but there was a complete absence of the typhus mental changes and a strongly positive Kahn and negative Weil-Felix reaction settled the diagnosis.

Kahn reaction was not carried out in all cases but in no case of proved typhus was Kahn quoted as more than doubtful positive—negative when repeated after the febrile phase.

Four cases of urban typhus occurred during the period under review. Clinically these were very similar to scrub typhus though no eschar was present and the disease though running an indistinguishable fever appeared to be much milder and mental changes were not observed.

The Weil-Felix reactions of these cases are of interest as showing a coincident early rise of OXK.
Primary reliance must be placed on the most careful of nursing with the minimum of disturbance. In this respect we were fortunate in having a static Base hospital to which patients came without long tiresome journeys and from which there was no necessity for transference until convalescence was well established.

Adequate fluid and salt intake are considered vital essentials and carefully kept fluid balance charts and daily urinary chloride estimations were insisted upon. For the first week patient could generally be encouraged to take a diet of high caloric value but thereafter reliance had to be placed mainly on fluid nourishment and milk feeds, glucose sweetened drinks and meat extracts were given on a two-hourly basis. Diet was supplemented by compound vitamin tablets—six per day—this was thought to be of value particularly with regard to vitamin B, content (1 mgm. per tablet).

Mepacrine 0.1 grammes t.d.s. was given for seven days to ensure that no malaria break-through occurred.

Sedatives were liberally employed for though apathy was marked insomnia was frequent. Bromide, chloral and phenobarbitone were employed in the early stages and where there was restlessness paraldehyde was found most useful given orally, rectally or intramuscularly—this last in dosage of 10 to 15 c.c. and repeated if necessary after four hours.

The sulphonamides were not employed, previous experience having proved them to be valueless except in secondary pneumonic complications.

In no case was there clinical evidence of oedema and urinary output remained satisfactory so that recourse to diuretics was not necessary.

In cases where at about the twelfth day blood-pressure appeared to be dropping to a dangerously low level a reconstituted dried plasma infusion was given—one to two pints given by slow drip. This was in all cases found to be beneficial. One case after about 200 c.c. developed a severe rigor became deeply cyanosed and pulse was uncountably rapid. The plasma drip was stopped, foot of bed raised and coramine injection given. Recovery was rapid and patient's mental state improved quite remarkably—he himself volunteering the information that he was now going to recover—subsequent progress proved the truth of the statement.

Penicillin Therapy.

In the first 20 cases treated, penicillin was not used and of these two died. It was therefore apparent that the epidemic was at least of not less than average severity and though previous reports on the use of penicillin in scrub typhus had not been encouraging further trial was considered justifiable. Accordingly
10 cases were selected as being either complicated or, as judged on clinical grounds, likely to be of more than average severity.

The special features of these 10 cases are shown in the following table:

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Diagnostic data</th>
<th>Special features</th>
<th>Day of disease started penicillin</th>
<th>Penicillin dosage</th>
<th>Duration fever days</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OXK 1/1280</td>
<td>Onset scrub typhus coincided with road accident in which sustained fractures of femur and humerus. Developed bronchopneumonia on fifth day of illness</td>
<td>5 20,000 × 3 hourly to total 1,120,000 units</td>
<td>Condition remained extremely critical until fourth day of penicillin when improvement noted and subsequently maintained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>OXK 1/320</td>
<td>A severe infection with repeated hæmatemesis</td>
<td>8 20,000 × 3 hourly to total 900,000 units</td>
<td>Died</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>OXK 1/640</td>
<td>An elderly Indian—extreme toxaemia and bilateral bronchopneumonia.</td>
<td>15 20,000 × 3 hourly to total 960,000 units</td>
<td>Died during therapy little changed noted —thereafter complete uncomplicated recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>OXK 1/2560</td>
<td>Clinically a very severe infection.</td>
<td>5 40,000 × 3 hourly to total 1,600,000 units</td>
<td>For first four days of therapy little changed noted —thereafter complete uncomplicated recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>OXK 1/640</td>
<td>Clinically a very severe infection with right-sided pneumonic signs</td>
<td>8 40,000 × 3 hourly to total 1,600,000 units</td>
<td>Improvement during therapy not noted — developed pleural effusion during convalescence but finally satisfactory resolution.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Clinical and Other Notes

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age</th>
<th>Diagnostic data</th>
<th>Special features</th>
<th>Day of disease started penicillin</th>
<th>Duration fever days</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>45</td>
<td>OXK 1/160</td>
<td>A middle-aged woman of extremely poor physique—clinically bad prognosis. No pulmonary complications.</td>
<td>9 40,000 × 3 hourly to total 1,600,000</td>
<td>17</td>
<td>Improvement not apparent during penicillin therapy but recovery complete.</td>
</tr>
<tr>
<td>7</td>
<td>23</td>
<td>OXK 1/1280</td>
<td>Clinically severe infection—extensive bronchitis.</td>
<td>12 40,000 × 3 hourly to total 1,600,000</td>
<td>23</td>
<td>Improvement slight during therapy but anticipated deterioration did not occur—complete recovery.</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>OXK 1/320</td>
<td>Patient received as transfer from another medical unit on twelfth day of illness as bilateral delayed resolution bronchopneumonia. Semicomatose on admission.</td>
<td>15 40,000 × 3 hourly to total 1,600,000</td>
<td>18</td>
<td>Improvement noted after first day penicillin—complete recovery during prolonged convalescence.</td>
</tr>
<tr>
<td>9</td>
<td>25</td>
<td>OXK 1/320</td>
<td>Clinically severe infection—no respiratory complications.</td>
<td>10 40,000 × 3 hourly to total 1,600,000</td>
<td>16</td>
<td>Slight improvement apparent on third day therapy.</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>OXK 1/640</td>
<td>Clinically a severe infection with bronchitis.</td>
<td>9 40,000 × 3 hourly to total 1,600,000</td>
<td>18</td>
<td>Improvement slight during therapy but no deterioration—complete recovery.</td>
</tr>
</tbody>
</table>

An analysis of these cases shows that:

(a) In all the diagnosis was confirmed.

(b) Two cases were over 40 years of age—which per se renders prognosis grave.

(c) Six cases showed pulmonary complications but what is of greater interest is that four had no evidence of such.

(d) One case with coincident severe injuries and unmodified typhus recovered.
(e) Day of disease on which penicillin therapy was initiated varied widely depending on the particular features of the case.

(f) Penicillin dosage was increased in later cases with what was clinically judged to be a better response.

(g) The duration of fever was in no case shortened.

(h) Effects of penicillin were for the most part rather negatively satisfactory in that while improvement was not immediately apparent the anticipated deterioration of condition did not occur.

It is to be noted that in those who commenced penicillin therapy on ninth day of illness or later the improvement was apparent about the same time as would have been looked for in the uncomplicated case.

That four cases showed no evidence of pulmonary complications suggests that the alleged value of penicillin is not solely confined to counteracting or preventing onset of such secondary mischief.

The evidence that penicillin is of value is essentially therefore based on clinical impression and the view is held that while not being curative penicillin exerts a favourable influence which in severe cases may prove just sufficient to enable natural recovery to occur.

**Summary.**

Fifty-six cases of scrub typhus treated in a Military Hospital in Malaya have been described.

Treatment has been discussed with particular reference to penicillin and a plea for further extended trial in high dosage submitted.

**IMPRESSIONS OF A MEDICAL OFFICER TO A CIVIL RESETTLEMENT UNIT.**

**BY**

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The problems of the repatriated prisoner of war have attracted the attention of numerous observers, a number of articles having appeared in the medical press in the last few years. Newman, himself an escaped P.O.W., drew attention in 1944 to the prisoner mentality and the problems of repatriation. The psychological stress of captivity was observed during the 1914-18 war (Vischner, 1919). It is only during the late war that the problems of readjustment of the ex-P.O.W. to civilian life have assumed considerable importance. Cochrane (1944) states that those best adapted to imprisonment found the most difficulty in adapting to England. The state, which he happily terms “gefangenitis,” is a normal reaction to an abnormal external environment; so, also the difficulties and anxieties of readjustment cannot be regarded as manifestations of profound psychological illness. It is the problem of all displaced persons generally.