Clinical and other Notes.

A CASE OF PARATYPHOID FEVER TREATED WITH A VACCINE WITH A NOTE ON THE AGGLUTININ CONTENT OF THE BLOOD.

By MAJOR ALEXANDER HOOD.
Royal Army Medical Corps.

AND

CAPTAIN J. B. WILLIAMSON.
Royal Army Medical Corps.

SIGNALLER J. was admitted to No. 3 General Hospital, Langenfeld, on May 25, 1923, as a transfer from 36 Casualty Clearing Station, Cologne, convalescent from an acute attack of tonsillitis. This had cleared up on arrival, but for the first four days the patient had an evening temperature of 99° F. This was proved on investigation to be due to a tubercular lesion at the apex of the right lung. No bacilli were found, but the sputum was blood-tinged daily.

On May 30, 1923, the patient's condition underwent a rapid change. The evening temperature rose to 101° F. with a pulse of 98; there was a well-marked rigor and complaint of general headache. By the next evening the temperature had reached 103° F., and the pulse was 84. The patient was flushed and hot, but otherwise there were no physical signs. The temperature remained for the next five days at a varying level from 101° F. to 103° F. There were no signs or symptoms pointing to, the nature of the fever. A leucocyte count of a total value of 6,000, with a differential count of 46 per cent polymorphs against 52 per cent lymphocytes (both varieties), and hyalines 2 per cent was of negative value in excluding all conditions associated with a polymorph increase, but was compatible with the tubercular lesion per se.

The next day—the eighth of the disease—blood was withdrawn for culture. At the same time Marris's atropine test gave a positive result—the reading of the pulse half an hour after an injection of 33-grain atropine sulphate being 80 compared with 70 before. This was a helpful confirmatory point in arriving at a diagnosis of enteric-group infection. However, the same evening large rose spots appeared, and the next morning a typical enteric smell was obvious. The patient's general condition by now was far from satisfactory, meteorism was present as evidenced by an enlarged and tender abdomen, the patient was listless and apathetic, sordes tended to accumulate in the mouth; the pulse, though regular and slow, was weak and compressible, so that the clinical picture
was one of severe toxæmia. Vaccine treatment was instituted at this stage.

In the absence of knowledge of the exact nature of the infection, stock T.A.B. vaccine was employed, one minim, corresponding to 55 millions of *Bacillus typhosus*, 42 millions of *B. paratyphosus* A, and 42 millions *B. paratyphosus* B being the unit employed.

The first injection of one minim was given on June 7, 1923, being the ninth day of disease. The injection was followed by a severe local reaction and a general reaction manifested by an extra rise of temperature of one degree; no marked change occurred. On the eleventh day two minims were injected, a severe local reaction occurred again, but the interesting thing is, that the temperature now developed a remittent swinging character with a lessening range each day. The fact that this occurred as early as the eleventh day of the disease may have been a coincidence, but, taken in conjunction with the rapid amelioration in the general condition, it seems very probable that the vaccine played a large part in the unexpected improvement in the clinical manifestations. A third injection of 3 minims was given on the thirteenth day, 4 minims on the sixteenth day, and 6 minims on the nineteenth day of disease. The course of the disease was nineteen days, excluding a small rise, really due to the last vaccine injection. The disease cannot be considered to be shortened, but just as it can be claimed that the absence of complications, the modified course of the fever, and the early onset of lysis, may be due to vaccine therapy, much more so can the absence of any extension of the tubercular lesion be considered to be very definitely due to the vaccine.
Paratyphoid B is one of the most serious accompaniments of pulmonary tuberculosis. One might readily have expected a slow chronic process to have developed into an acute febrile condition. Far from progressing downhill after the acute illness, the patient made a surprisingly good convalescence, and, except for an occasional evening rise to 99° F., looks and feels well, and has put on weight.

The *B. paratyphosus* B was never isolated from the case, blood culture on the eighth day being negative; faeces and urine were cultured many times, both during the disease and in convalescence, but no organism of the enteric group was isolated. The diagnosis of paratyphoid B fever was made on the following grounds:—

1. The case was one of a small group of similar cases exposed to a short-lived infection from several of whom the *B. paratyphosus* B was isolated.

2. The second Widal test points to the same infection (see chart).

3. The clinical symptoms and physical signs were similar to the other cases mentioned under (1) above.

The results of the Widal tests were interesting, and are shown in the chart attached; Dreyer's technique was employed, and the results expressed in agglutinin units per cubic centimetre of serum. These tests were done against *B. typhosus*, *B. paratyphosus* A, and *B. paratyphosus* B, on the eighth, seventeenth, twenty-fourth, thirty-fourth, and seventy-ninth days after the commencement of the disease. On looking at the chart, it will be seen that on the seventeenth day when the second Widal was done, the agglutinins against *B. paratyphosus* B had reached the high figure of 880, whilst those against *B. typhosus* and *B. paratyphosus* A were under 100. He had been inoculated with T.A.B. vaccine (two doses) three years previously. Stock T.A.B. vaccine was given as indicated above, so that by the eighteenth day 16 minims equal to 880 millions *B. typhosus*, and 670 millions each of *B. paratyphosus* A and *B. paratyphosus* B. Six days after the last injection the Widal test was done again (twenty-fourth day of disease); by that time the effect of the vaccine was well marked, agglutinins for T. and A. had risen to 2,000 and 1,500 respectively, whilst those for B. were 2,600 units. The fourth Widal, on the thirty-fourth day of disease, showed a further rise in T. and A. agglutinins and a sharp fall in B. agglutinins, the patient now being convalescent. Compared with the Widal curves of fourteen other patients not treated by vaccine, it cannot be said that this patient showed any marked difference in his agglutinin curve against *B. paratyphosus* B—the rise was no more rapid, the height no greater, and the maintenance no longer, being only slightly above average in these respects. That his agglutinin production would have been so marked without the vaccine is a matter for speculation, but, as his response to the T. and A. part of the vaccine was so good, we conclude that the B. response was similar. It will be noted that the development of T. and A. agglutinins due to the vaccine was not seen on the seventeenth day, by
which time the patient had received ten minims of vaccine; one week later they had reached a high figure. This indicates the development of agglutinins due to the treatment as distinct from the disease, and if the agglutinin curve is an indication of developed immunity, it follows that to be of the greatest value vaccine treatment must be started early preferably by the fifth day of disease. By the seventy-ninth day it is interesting to note that there were more agglutinins present for *B. typhosus* produced by the vaccine than for *B. paratyphosus* produced by both vaccine and disease.

**CONCLUSIONS.**

While we recognize that conclusions based on one case are fallacious[1], at the same time they are worth recording, and this case brings the following points out:

1. The clinical improvement following the administration of the vaccine was well marked.
2. A case dangerously complicated by the presence of pulmonary tuberculosis, and which, to begin with, promised to be severe, ran an average course under vaccine treatment.
3. Agglutinin production against *B. typhosus* and *B. paratyphosus* A, due to the vaccine, began between the eighth and the fifteenth day after the first dose; when it began for *B. paratyphosus* B is doubtful, but as the body had already commenced the process, the vaccine probably stimulated this production earlier.
4. The relative positions of the agglutinin curves on the seventy-ninth day after the disease commenced, T. being highest, A. lowest, and B. intermediate.

**EDITOR'S NOTE.**

Lieutenant-Colonel Perry, R.A.M.C., Professor of Pathology Royal Army Medical College, to whom we referred this paper, has made the following criticisms:—

"It is obvious that observations based on the experience of one case must be fallacious. This is emphasized in the paper by Whittington [1] on the use of stock vaccines employed in 230 cases of typhoid infection. His conclusions are: (a) That the vaccine, used therapeutically, neither shortened the fever nor reduced the number of complications. (b) That there was some indication that the vaccine increased the incidence of haemorrhage. He adds: 'that these conclusions are contrary to the impressions I had received during the treatment of the earlier cases. I had not then seen a sufficient number of similar cases which did well without vaccine, and, being rather biased in favour, I gave undeserved credit to this treatment.'"

On the other hand, MacArthur publishes three cases [2] which were treated by vaccine and which impressed him favourably. These cases were inoculated during the incubation period of the disease.
It is probable that these divergent observations would be brought into line if the period of the disease at which vaccine treatment was initiated was taken into consideration. It is obvious that in the developed disease vaccine treatment can be of little avail, whereas in the very early period favourable results are likely to follow its administration.

REFERENCES.


CLINICAL NOTES ON A CASE OF FRACTURED PELVIS COMPLICATED BY EXTRA-PERITONEAL RUPTURE OF BLADDER.

By Captain Manfred Morris,
Royal Army Medical Corps,
Surgical Specialist, Colchester.

The routine of the surgical specialist is so rarely disturbed during the summer months by problems arising from severe traumatic conditions that it is hoped these few notes may be found of interest.

A civil subordinate, aged 43, attached to the R.E. Works Department, whilst at work was struck down by a wooden platform on which were lying several bags of cement. The platform was suspended from the end of a travelling crane by chains, one of which snapped and so caused the accident.

The patient stated "he was crushed in or near the middle," but was naturally unable to give much detail of the accident. He was given first aid locally, and his notes stated: "He has sustained a compound fracture of the nasal bones and scalp wounds necessitating seventeen sutures. He is unable to pass water and a catheter draws off blood-stained urine. He has severe contusions of the right hip and the left shoulder."

I do not propose to refer again to the injuries of the head and shoulder, but will confine myself to a description of the abdominal condition.

My attention was drawn to this case five hours after the injury had been received and after the patient had completed a journey of some hours in an ambulance. He was then suffering from profound shock, was cold, pulse 120 and temperature sub-normal. The man was perfectly conscious, and complained of agonizing pain in the abdomen, situated chiefly in the hypogastrium. The pain was described as of a stabbing, rather than of a colicky nature. He had not vomited and had passed flatus. The facies was that of a severe haemorrhage case, the mucous membranes being very anaemic. The abdomen moved very little on respiration. There was a mass the size of a large orange with indefinite edges in the left Poupard and iliac regions. This was semi-solid and equisitely tender. The