SOME OBSERVATIONS ON THE WEIL-FELIX REACTION.

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DURING the year 1934 and the first three months of 1935, a considerable number of agglutination tests were carried out in the Deccan District Laboratory, on the sera of patients, of healthy human controls—both British and Indian—and of bullocks, goats and rats.

The results are given below.

In every case the same technique was observed. Concentrated “O” emulsions of Proteus X2, X19, and XK were employed. The original dilutions put up were 1:25 to 1:250. Incubation for four and a half hours at 55° C. was followed by placing over night in the 37° C. incubator. The tubes were read next morning after twenty minutes in the water bath at 55° C. The actual tests and the readings (read in a comparator with a hand lens) were done by the writer—so personal variations were obviated.

I.—WEIL-FELIX REACTIONS IN CASES OF ENTERIC INFECTION IN WHICH THE ORGANISM WAS ISOLATED FROM THE PATIENT’S BLOOD.

There were eight such cases—three of B. paratyphosum A, and five of B. typhosum. The titres obtained for the causative organism varied from 175 to 4,000 in the case of B. paratyphosum A, and from 25 to 5,000 in the case of B. typhosum.

In no single case did the titres for proteus OX2, OX19, or OXK rise above 50 which, as will be shown later, is that obtained in the healthy controls.

II.—TYPHUS GROUP CASES SHOWING AN ASSOCIATED RISE IN TITRE FOR B. PARATYPHOSUM B.

In eight cases of typhus group infection, a definite, and in some cases a considerable, rise was noted for B. paratyphosum B. Titres from 135 to 2,000 were found for the latter organism, whereas the associated titres for the proteus group ranged from 1,000 to 100,000.

There can be little doubt that in the absence of the Weil-Felix reaction, a percentage of these cases would have been diagnosed “Enteric Group” infection.


Of the 17 cases, 2 showed a diagnostic rise for OX2, 9 for OX19, and 6 for OXK. The lowest titre obtained was 500, the highest 100,000.
Some Observations on the Weil-Felix Reaction

There was considerable variation in the date of disease on which the highest titres were obtained. But generally speaking, the maximum titre was obtained between the ninth to fourteenth day of the infection. In eleven cases, the Weil-Felix reaction was repeated from three to seven months after the onset of the disease, and it was noted that in no case were agglutinins present in dilutions over 125 (1 case). In other words there was no evidence from the Weil-Felix reaction at these periods that the patient had suffered from the disease.

The variation in the agglutinogenetic response was very considerable and appeared to have no close relationship to the severity of the infection.

IV.—(a) Weil-Felix Reactions in 100 Healthy Volunteers (Indian Troops).

These were undertaken to discover what agglutinins, if any, might be found in healthy individuals and whether from the results obtained any standard could be arrived at on which to base a diagnosis of typhus group infection. Up to date a titre of 250 or over has been taken as diagnostic. Of the 100 cases:

- 18 per cent showed no agglutinins.
- 30 per cent showed agglutinins up to a titre of 25.
- 51 per cent showed agglutinins up to a titre of 50.
- 1 per cent showed agglutinins up to a titre of 125 (OXK).

(b) Weil-Felix Reactions in 50 Healthy Volunteers (British Troops).

In this series, even lower results were obtained. In no case was a titre of over 50 discovered. In 36 per cent no agglutinins were present, in 64 per cent agglutinins were present from 25 to 50.

From the above 150 results, it is suggested that the present arbitrary standard titre for diagnosis, i.e. 250, may be too high, and that a case suggestive clinically of typhus group infection, might be diagnosed on a lower titre.

V.—Weil-Felix Reactions Performed on the Sera of 100 Rats (Trapped in Connexion with Anti-Plague Measures), Bled and Sera Put Up in the Laboratory.

In this series, there was a fairly constant presence of agglutinins—notably for OXK. The highest titre reached was 125, found in 12 per cent of the animals.

- In 69 per cent agglutinins for OXK were found ranging from 25 to 125.
- In 12 per cent agglutinins for OX2 were found ranging from 25 to 125.
- In 4 per cent agglutinins for OX19 were found ranging from 25 to 50.

1 A careful cross-examination of this volunteer revealed no history of fever, indisposition, journeys, leave, or of residence in camp.

In only two animals was a titre exceeding 50 found. These two animals had titres of 1:500 and 1:125 for OXK. Titres of from 25 to 50 were found in 81 per cent for OX2, in 39 per cent for OX19 and in 81 per cent for OXK.


In no case was a titre of over 50 found. 100 per cent showed no agglutinins for OX19, 50 per cent showed agglutinins for OX2 ranging from 25 to 50 and 81 per cent showed agglutinins for OXK ranging from 25 to 50.

Conclusions.

(1) That there is no rise in the Weil-Felix reaction in cases of enteric group fevers from which the organism has been isolated from the blood-stream.

(2) That in some cases of typhus group fevers, there is an associated rise of agglutinins for *B. paratyphosum* B.

(3) That there is great variation in the titre found for OX2, OX19 and OXK in cases of typhus group fevers. Taking a titre of 1:250 as diagnostic, titres ranging from 1:250 to 1:100,000 were found; three to six months afterwards there is no evidence from Weil-Felix reactions of the infection, i.e., the agglutinogenetic response is fleeting.

(4) In 150 tests on the sera of British and Indian volunteers, only in one case was a titre of 1:125 discovered, and it is suggested that the arbitrary diagnostic titre of 250 may be lowered.

(5) In 100 tests on the sera of trapped rats, titres from 1:25 to 1:125 were frequent.

(6) In 100 tests on the sera of bullocks, one gave agglutination to 1:500 for OXK. Many gave up to 1:50.

(7) In 100 tests on the sera of goats, apart from complete absence of agglutinins for OX19, the results were of no significance.