A FLOCCULATION TEST FOR CEREBROSPINAL FLUID.

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FLOCCULATION tests for the examination of blood serum for syphilis have made much progress during the past decade, and many of the eminent serologists whose names have been associated with these tests have attempted to make them applicable to the examination of cerebrospinal fluid.

At the second Laboratory Conference on the Serodiagnosis of Syphilis held in Copenhagen in 1928, under the auspices of the Health Organisation section of the League of Nations, 122 cerebrospinal fluids were examined by three modifications of the Bordet-Wassermann reaction and by the Kahn, Meinicke, Muller, Sachs Witebsky, Norel and Vernes Bricq methods. Owing to the fact that in several cases the quantity of fluid available was insufficient, and especially as, owing to the time taken in transit from abroad, much of the material was not suitable for examination, no definite conclusion was drawn from the results obtained.

It was decided after the conference to take advantage of Dr. Kahn's presence in London for a few weeks to carry out a comparison of the Kahn with the Bordet-Wassermann Test (Harrison-Wyler method).

Five hundred and fifty-five cerebrospinal fluids were tested. Due perhaps to transit by post in hot weather, many of these were clouded, so for purposes of analysis they were divided into 317 clear fluids and 238 cloudy fluids. In the first series there was an agreement between the tests in approximately 75 per cent. of the specimens, and in the second in approximately 72 per cent. Dr. Kahn at that time was still carrying out investigations with a view to increasing the sensitivity of his reaction. The test, however, does not offer any special simplicity in technique and it takes some time to perform.

S. Muttermilch and E. Salamon¹ modified the Meinicke opacity (turbidity) test in an attempt to apply it to cerebrospinal fluid examinations, and in 200 fluids which they examined by the Meinicke, the Bordet-Wassermann, the colloidal benzoate and the paregoric elixir methods, they found agreement between the Wassermann and Meinicke reactions in 95 per cent. of the cases.

Schnitzer² used Untersteiner's modification of the Meinicke test for the examination of cerebrospinal fluid and found the results somewhat less certain and reliable than those obtained by the Wassermann reaction. He proposed a further modification to increase the sensitivity of the test.

Since February, 1930, Untersteiner's modification of the Meinicke turbidity test has been used at Whittingham Mental Hospital for the examination of cerebrospinal fluids. In all the specimens a confirmatory Wassermann reaction was performed at the Public Health Laboratory of the University of Manchester, and the results in the two tests can now be compared.

TECHNIQUE.

A description of Untersteiner's modification of the M.T.R. for applying the test to cerebrospinal fluid is here given.

One part of M.T.R. extract is mixed with five parts of 1 per cent. saline; after heating them to 45° C. 0.5 c.c. of this mixture is added to 0.5 c.c. of active fluid and shaken. The test tubes are left at room temperature—60° F. The results are read in one hour by the hanging-drop method as described for the Meinicke micro-reaction³.

RESULTS.

Two hundred and thirty-eight cerebrospinal fluids were examined. In the first 28 cases 1 per cent. saline was used for mixing with the M.T.R. extract, but in the next 220 cases 2 per cent. saline was used. The results in the two series are given separately.

Five cases in the first series of 28 gave different W.R. and M.T.R. readings, and, in a sixth, the M.T.R. was ++ and the W.R. 'unsatisfactory, probably positive.' The five cases were all cases of general paralysis which had been treated. The readings were:—

M.T.R.	W.R.
(a) Positive.	Negative.
(b) Positive.	Doubtful.
(c) Negative.	Weakly positive.
(d) Negative.	Positive.
(e) Negative.	Positive.

In the next 210 fluids, using 2 per cent. saline, the M.T.R. and W.R. differed in only three of the specimens.

In these three cases:—

- The M.T.R. was negative, the W.R. weakly positive. Here the blood serum was + 1 in 15 W.R. and + in the M.T.R. (micro modification). The Lange colloidal gold curve was 1112282100.
- The specimen was blood-stained. M.T.R. positive. W.R. negative. The blood serum was + 1 in 45 W.R. The gold curve was 1112221000.
- M.T.R. positive. W.R. negative. In the blood serum, the M.T.R. was positive, the W.R. negative. Gold curve 1124582100.

Of the remaining 207 cases, 56 were positive in both M.T.R. and W.R.

and the remainder negative in both. The agreement was qualitative but not always quantitative. For instance the W.R. was often ++ when the M.T.R. was only +. This we regarded as a complete agreement between the tests. In both cases the opinion of the examiner was that the specimen was definitely syphilitic; even by using different W.R. techniques a difference in the degrees of positivity may be found in the same case.

In July, 1931, the new M.K.R. extract was substituted for the M.T.R. when examining the cerebrospinal fluid. Exactly the same technique was used, but no hanging-drop preparation was made, the test being used as a macro reaction. The tube containing 0.5 c.c. active fluid shaken up with 0.5 c.c. of the M.K.R. 2 per cent. saline mixture was left for six hours and then read. In a positive specimen the fluid became absolutely clear; in a less strongly positive it was slightly turbid but still transparent, and in a negative case it remained opaque.

One hundred and one cases were examined by the M.K.R. and a confirmatory W.R. performed on each. In only one case did the results differ. Here the M.K.R. was negative, the W.R. positive. The fluid was slightly hazy and a few r.b.cs. were present. Ross-Jones reaction negative: Pandy reaction weakly positive: gold curve 0001100000.

Of the remaining 100 cases, 17 were positive in both M.K.R. and W.R. and 83 negative in both. Again the agreement was qualitative and not always quantitative.

CONCLUSIONS.

The Meinicke clarification reaction (M.K.R.) is preferable to the Meinicke turbidity reaction (M.T.R.) because a hanging-drop preparation is not required, the test being suitable for use as a macro reaction. The cerebrospinal fluid does not require inactivation, the technique is exceedingly simple, and the percentage agreement with the Wassermann reaction is surprisingly high. It thus offers advantages over most of the other flocculation tests, and has proved itself serviceable and reliable.

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