

Clinical and other Notes.

A STUDY ON THE CULTURE OF THE TUBERCLE BACILLUS BY THE LOWENSTEIN-JENSEN MEDIUM.

BY CAPTAIN P. N. BARDHAN, I.M.S.

THE common methods of diagnosis of pulmonary tuberculosis are clinical examination, microscopical examination of the stained sputum, and radiography, or by a combination of these methods. Animal inoculation is not done generally except in institutions and it takes at least three weeks and often more to obtain reliable positive results. The Lowenstein-Jensen medium has been reported upon favourably from several sources claiming that positive culture results can be obtained by this method more quickly than by any other. The present study was undertaken to try out this medium and the work was done during a two and a half year period when the writer was in charge of the Brigade Laboratory at Jhansi. Material for the study was obtained from the local military hospitals, the cantonment general hospital and from private cases.

The work was divided into three blocks and, while work proceeded in all three blocks at the same time, the results are given under the block headings.

Block 1. This consisted of the sputa from proved open cases of pulmonary tuberculosis.

Block 2 consisted of cases diagnosed as pulmonary tuberculosis either clinically or radiographically but in which tubercle bacilli had not been found by the ordinary microscopical methods.

Block 3 included sputa from cases of bronchitis which on clinical grounds were non-tuberculous and in which tubercle bacilli had not been found microscopically.

The technique employed was as follows :

Twenty-four hours' sputum was collected and brought to the laboratory the next morning. No antiseptic was ever added to the sputum which was mixed with 4 per cent caustic soda in the proportion of 1 to 3. The resulting mixture was then centrifuged at 3,000 r.p.m. for forty minutes and the deposit neutralized with 8 per cent hydrochloric acid, added drop by drop, the reaction being tested by touching a litmus paper with a platinum loopful of the mixture. The neutralized deposit was inoculated with a pipette over three tubes of the medium which was made by the technique described in " Handbook of Practical Bacteriology " by Mackie and McCartney (1938).

The results are summarized below :

<i>Block.</i>	<i>Number of cases.</i>	<i>Positive culture.</i>	<i>Negative culture.</i>
1	52	39	13
2	47	30	17
3	76	11	65
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Total	175	80	95

The earliest positive result was read on the ninth morning and the latest on the twenty-fourth. No culture was considered negative till the fiftieth day.

In block 1 faulty media were responsible for four of the negatives but, for the other nine negatives, no explanation can be offered unless it be some technical error. The deduction from the results of block 1 are that about 75 per cent cases will yield positive results by the Lowenstein-Jensen medium.

In block 2, of the 30 culture positive cases, 17 became sputum positive microscopically within six months, 5 within nine months, and 1 remained sputum negative for a year when he was lost sight of. The remaining 7 ceased to attend from early in the course of the investigation. Of the 17 negatives 5 became sputum positive within four months, 2 within nine months, and the remaining 10 were lost trace of. It will be seen that about 64 per cent cases gave positive results by the culture method, and therefore helped in the earlier inauguration of treatment. The negative results do not detract from the value of the method.

In block 3 the results were somewhat surprising. The eleven positive cases were moving about in the community supposed to be suffering from winter cough and weak chest. As repeated microscopical examinations had failed to show any tubercle bacilli in their sputa they were naturally not very careful about their own health or with their sputa and thus they constituted a potential source of danger to the community. Of the sixty-five negatives only nineteen could be followed up and they remained sputum negative for a year though radiographically two have since been diagnosed as pulmonary tuberculosis. The conclusion drawn from block 3 is that culture of sputum is helpful.

CONTROL.

A comparative study has not been made with other recognized methods of culture for the tubercle bacillus neither have the results of this series been compared with the plain anti-formin method. A few animal inoculations have been done however and the results are tabulated below :

<i>Case No.</i>	<i>Culture result by Lowenstein-Jensen medium</i>	<i>Result of animal inoculation</i>
3	Positive	Negative
4	Positive	Positive
5	Positive	Positive
19	Negative	Positive
20	Positive	Negative
21	Negative	Negative
32	Positive	Negative
33	Positive	Positive
34	Positive	Negative

In five of the nine cases the results vary and in four they are the same. These numbers are of course too small to have any statistical value but they would appear to suggest that culture by Lowenstein-Jensen medium gives slightly better results than animal inoculation. Of course the inoculation method is also valuable as shown by the results of case 19 in the above series.

SUMMARY.

1. A series of 175 cases of pulmonary tuberculosis has been studied by means of Lowenstein-Jensen medium.

2. While the results may not have much statistical value, owing to the smallness of the number, they suggest that culture of sputum by the above medium is a helpful procedure in early and sputum negative cases of pulmonary tuberculosis.

3. The negative culture results do not detract from the value of the positive results.

4. Further trials by this medium are recommended.

It should be added that the acid and alcohol fast bacilli found on culture have not been made to comply with Koch's postulates.

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 CHEMICAL DISPOSAL OF SEWAGE.

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ORIGINAL experiments with the bucket type of chemical closet showed them to be unsatisfactory in Army use. The bucket fills quickly at the 5 per cent provision rate (i.e. 20 users per day) and the excreta form a mass standing above the level of the fluid. Daily emptying is required. A similar result can be obtained by the use of an ordinary latrine bucket with some added chemical fluid without the use of any special container.

Chemical disposal has obvious advantages in hygiene and convenience, the former being universal in immunity from flies, the latter particularly in areas where rock or geographic conditions make other forms of disposal impracticable.

Various experiments were carried out and conclusions may be divided into those regarding the fluid and those of design of closets.

Regarding composition of the fluid it was found that a mixture of sodium hydroxide and cresol was efficient. The former is important in disintegration and the latter in disinfection and deodorization. A suitable mixture was found to be 10 per cent caustic soda and 3 per cent cresol, i.e. 2 lb. of caustic soda, $\frac{1}{2}$ pint of cresol made up to 2 gallons with water. This worked efficiently until