ISOLATION OF BACTERIUM TYPHOSUM FROM PLEURAL EFFUSION AND SPUTUM IN A CASE OF TYPHOID FEVER.

By MAJOR R. A. HEPPLE, M.C.,
Royal Army Medical Corps

AND

MAJOR F. HOLMES,
Royal Army Medical Corps.

The case to be described possesses some unusual features which are considered worthy of record.

Serjeant H. was admitted to the British Military Hospital, Quetta, on October 1, 1935. The history, given by the patient himself, was that he had not felt well for about a week prior to admission, and that during this period he had suffered from headaches, repeated rigors with sweating, and a feeling of malaise.

On admission the evening temperature was 103.8° F., and physical examination revealed that the spleen was palpable and was half an inch below the costal margin. The tongue was moist and coated, but nothing abnormal was found in the other systems. Blood-films were examined on five occasions and no malaria parasites were found. Blood-culture for malaria was also negative, as was a blood-culture for organisms of the enteric group taken on the third day after admission. Blood-culture for this group of organisms was subsequently repeated on three occasions with negative results.

A white blood-count taken on the fifth day after admission indicated a leucopenia, i.e. 4,800, but there was no relative lymphocytosis.

The case was considered to be clinically one of the enteric group, and this was supported in some degree by the rise in agglutinins found in the Widal tests. Apart from fever and persistent headache there was nothing of note in the patient's condition.

On the ninth, tenth, and eleventh days after admission, Bacillus coli was isolated from the urine. The patient was placed on an alkaline diuretic mixture three times a day, and subsequent cultures of the urine were negative.

The patient's condition remained unaltered apart from a tendency for the temperature to assume a lower level. Headache was the only troublesome feature.

On October 14, which was considered to be the twenty-first day of the disease, Bact. typhosum was isolated from the stools. The isolation of this organism in conjunction with the clinical picture established the diagnosis as typhoid fever.

On the following day the temperature reached normal and the general condition of the patient was quite satisfactory. Two days later, however,
the temperature rose to 103·6° F. A relapse was suspected and blood for culture of enteric organisms was taken. This blood-culture was negative.

A few days later the patient developed pain on the right side on deep respiration with slight cough and increase of liver dullness upwards posteriorly. Signs of a bilateral patchy bronchopneumonia more marked on the right than on the left side developed. Signs of a pleuritic effusion developed subsequently and exploratory puncture of the right pleural cavity was carried out. This yielded about three cubic centimetres of serous fluid which was slightly blood-stained. This fluid was sent to the District Laboratory for examination and was cultured on agar and blood-agar. A Gram-negative bacillus which, on further investigation, proved to be \textit{Bact. typhosum} was grown on both media. In view of this result, which was, quite frankly, unexpected, and as the patient was coughing up a small amount of purulent sputum which was blood-stained, culture of the sputum was carried out daily. In the first instance the sputum was plated direct on litmus lactose bile salt agar, and also on the same medium after passing the sputum through 1 : 200,000 brilliant green. Direct plating yielded one colony of \textit{Bact. typhosum} in addition to staphylococci, while plating after passing through brilliant green resulted in a luxurious growth of \textit{Bact. typhosum} in pure culture.

Up to the moment of writing this note (February 1, 1936) \textit{Bact. typhosum} has been isolated from the sputum on twenty-four occasions out of forty specimens examined by the brilliant green method. Recent specimens have on occasion given a pure culture of the organism by direct plating, as well as by the brilliant green method. As a precautionary measure the orderlies wear gauze masks in attending to him. The question of droplet infection was investigated by making the patient cough at a L.L.B.S.A. plate held two feet away on several occasions. \textit{Bact. typhosum} was not cultured on any of these occasions. Actually, we have observed that the organism is only cultured when the specimen is definitely purulent.

The patient is now convalescent and his condition is quite satisfactory, apart from slight cough and scanty sputum.

A summary of the laboratory findings is appended for ready reference.

1. Examination of films for malaria—five on 1·10 and 2·10: result negative.
2. Blood-cultures.
   
   \begin{tabular}{|c|c|c|c|c|}
   \hline
   Date & 3.10.35 & 7.10.35 & 17.10.35 & 26.10.35 \\
   \hline
   Day of disease & 10th & 14th & 24th & 32nd \\
   Result & Neg. & Neg. & Neg. & Neg. \\
   \hline
   
   
   
   3. Blood-culture for malaria parasites, 2.10.35: result negative.
   4. White blood-counts:

   October 2, 1935: Total, 4,800. Neutrophil polymorphs, 72 per cent; lymphocytes, 26 per cent; large mononuclears, 2 per cent.

   November 8: Total, 11,700. Neutrophil polymorphs, 85 per cent;
Clinical and other Notes

lymphocytes, 13 per cent; eosinophils, 1 per cent; large mononuclears, 1 per cent.

(5) Culture of faeces:

<table>
<thead>
<tr>
<th>Date</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.10.35</td>
<td>Bact. typhosum isolated</td>
</tr>
</tbody>
</table>

(6) Agglutination tests:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day of disease</th>
<th>Result</th>
<th>T.</th>
<th>A.</th>
<th>B.</th>
<th>TO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.10.35</td>
<td>12th</td>
<td>25</td>
<td>50</td>
<td>125</td>
<td>125</td>
<td>50</td>
</tr>
<tr>
<td>7.10.35</td>
<td>14th</td>
<td>50</td>
<td>50</td>
<td>125</td>
<td>125</td>
<td>50</td>
</tr>
<tr>
<td>10.10.35</td>
<td>17th</td>
<td>50</td>
<td>50</td>
<td>125</td>
<td>125</td>
<td>50</td>
</tr>
<tr>
<td>15.10.35</td>
<td>22nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(7) Culture of pleural fluid:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day of disease</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.11.35</td>
<td>48th</td>
<td>Bact. typhosum isolated</td>
</tr>
</tbody>
</table>

(8) Culture of sputum: Bact. typhosum isolated on November 13, 1935 (fifty-second day of disease), and on twenty-three subsequent occasions out of forty specimens examined. The brilliant green method mentioned above was used.

Culture on blood-agar showed the presence of Bact. typhosum on occasions and also staphylococci and streptococci in short chains.

Discussion.

The points of interest in this case are:

(1) The development of a B. coli bacilluria during the third week of illness. We suggest that this may have been due to a blood infection via the typhoid ulceration of the gut.

(2) The isolation of Bact. typhosum from the pleural effusion. We have not found a record of a similar isolation in the medical literature available in Quetta.

(3) The ease with which a profuse growth of Bact. typhosum in pure culture was isolated on twenty-four occasions from the sputum after passage through brilliant green. It is suggested that this method might be used with advantage in examining sputum for organisms in cases of bronchopneumonia of doubtful origin. By its use difficult cases of enteric fever might be diagnosed.

(4) The fact that the patient was a "lung carrier" during convalescence. We have mentioned in the text, however, that the organism was only isolated from sputum which was definitely purulent, and that isolation from L.L.B.S.A. plates at which the patient had coughed failed.

Our thanks are due to Lieutenant-Colonel W. L. Webster, Officer Commanding, British Military Hospital, Quetta, and to Colonel J. B. Grogan, A.D.M.S., Baluchistan District, for permission to forward this note for publication.