Guillain-Barré Syndrome

A Laboratory Perspective

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Diagnosis of GBS

• GBS is generally diagnosed on clinical grounds

• Basic laboratory studies are of limited value in diagnosis

• Ordered to exclude other diagnoses and to better assist functional status and prognosis

• Ordering of specific tests would be guided by the patient’s history and presentation
Admission to RBH

• Case was admitted to RBH with paralysis of the left arm which progressed to further paralysis within 24 hours

LAB TESTS PERFORMED:

• Lumbar puncture

• Serology
Lumbar Puncture

• Sample taken from the spinal fluid to test for cells, bacteria, protein & glucose
• Sent to microbiology and biochemistry for analysis
• Most GBS patients will have an elevated CSF protein level (>400 mg/L) with normal cell counts
• CSF protein levels may not rise for 2-3 weeks after the onset of weakness
Serology

- A blood sample can be taken to check for antibodies present
- In GBS assays for the following agents may be considered;
  - *Campylobacter jejuni*
  - Cytomegalovirus
  - Epstein-Barr virus
  - Herpes Simplex virus
  - HIV
  - *Mycoplasma pneumoniae*
- This case was found to be caused by food poisoning from chicken or a derivative of chicken
- This suggests that the causative agent was *C. jejuni*
Campylobacter jejuni

- Known to be the single most identifiable antecedent infection associated with the development of GBS
- Thought to cause autoimmune disease through a mechanism called molecular mimicry
- Campylobacter elicit auto antibodies that react with peripheral nerves
- Immunoglobulin therapy prescribed to block these antibodies produced by the body
Admission to ITU

- On admission to ITU a urinary catheter was inserted

- Tracheal intubation occurred due to breathing difficulties

- Blood tests were taken and sent to a specialist laboratory
Laboratory Tests Performed whilst in ITU (based on OUH)

- Daily
  Full blood count, urea & electrolytes and liver function tests
- BAL/Tracheal aspirate twice weekly
- MRSA screening on admission and then weekly
- Blood cultures taken at any time of fever or suspected sepsis (urine also collected)
Biochemistry & Haematology

- Full blood count – provides important information about the kinds and numbers of cells in the blood. Abnormalities can indicate the presence on important medical diseases.
- Urea & Electrolytes – an insight to how the kidney is functioning.
- Liver function tests – used to help determine the cause of jaundice and to screen for potential liver damage.
Perforation of the Bowel

- Constipation is often seen when patients are less mobile (in this case paralysis)
- The faeces becomes hardened which led to stercoral perforation
- This is a dangerous and life threatening situation which is dealt with by, often emergency, surgery
- Bowel contents leak in to the abdominal cavity which leads to peritonitis, rapid bacteraemia and often many further complications
Peritonitis

• Samples of the peritoneal fluid would be sent to microbiology for analysis
• A series of selective agars would be used to isolate relevant bacterial pathogens
• A Gram stain would also be performed to identify any bacteria present
Sepsis

- Blood cultures would be taken to check for pathogens present in the blood
- Began treatment with Ertapenem
- Broad spectrum carbapenem used primarily for treatment of aerobic Gram negative bacterial infections
Urinary Tract Infection

• When a patient has a catheter inserted they are much more likely to develop an UTI
• The risk of developing a catheter-related UTI rises by 5% for each day it is placed
• Enteric pathogens (ex *Escherichia coli*) are mostly responsible but other species are known to cause infection
• Once the organism has been identified, the relevant sensitivities are performed
• This can be done by manual or automated techniques (dependent on the laboratory)
• It was found that the case had an ESBL (most common *E. coli* or *K. pneumoniae*)
• Organism is very resistant strain
• Often treated with carbapenems ex imipenem, meropenem or ertapenem
Chest Infection

• A chest infection developed which was treated with flucloxacillin.
• This suggests that it could have been due to a Gram positive organism, such as *Staphylococcus aureus*.
• Organism is often commensal flora and could have caused infection by tracking down the tracheostomy tube in place.
# Summary of Laboratory Tests Performed

<table>
<thead>
<tr>
<th>Test</th>
<th>Number Performed (estimated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full blood count</td>
<td>30</td>
</tr>
<tr>
<td>Urea &amp; electrolytes</td>
<td>30</td>
</tr>
<tr>
<td>Liver function tests</td>
<td>30</td>
</tr>
<tr>
<td>Lumbar puncture (consisting of microbiology &amp; biochemistry)</td>
<td>2</td>
</tr>
<tr>
<td>BAL/tracheal aspirate</td>
<td>up to 10</td>
</tr>
<tr>
<td>Blood culture</td>
<td>6</td>
</tr>
<tr>
<td>Urine culture</td>
<td>6</td>
</tr>
<tr>
<td>Peritoneal fluid</td>
<td>1</td>
</tr>
<tr>
<td>MRSA samples</td>
<td>6</td>
</tr>
<tr>
<td>Serology</td>
<td>4</td>
</tr>
</tbody>
</table>
With thanks to;

Dr I Bowler for clinical interpretation and guidance on this case study

References


