MECHANISMS OF HUMAN DISEASE AND
PHARMACOLOGY & THERAPEUTICS

CASE-BASED SMALL GROUP DISCUSSION

MHD II
Session 11

Viruses

April 5, 2019

STUDENT COPY
CASE HISTORY 1

Chief complaint: “Our baby is sick x 3 days”

HPI: The patient is a 1 year-old boy brought to the emergency department in January. His parents report that he has had a 3 day history of fever, yellow watery diarrhea, emesis, and decreased urine output. He is less interested in play than usual.

PMHx: He has been previously healthy and is up to date on his vaccinations.

Medications: His parents have given him children’s acetaminophen for the fevers. He takes no other medications.

Physical Exam: Vitals signs: Temperature of 39.5°C, pulse of 165 beats/min, and respirations of 32/min. Weight 20 pounds (per mother his weight was 22 pounds 1 week ago). His general physical examination is remarkable for dry mouth, decreased tears when crying and hyperactive bowel sounds. Capillary refill is 3 seconds.

He is admitted to the hospital.

LABORATORY DATA

<table>
<thead>
<tr>
<th>Basic Metabolic Panel</th>
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</thead>
<tbody>
<tr>
<td>Glucose</td>
<td>80</td>
<td>[70 -100] mg/dl</td>
<td></td>
</tr>
<tr>
<td>Blood Urea Nitrogen</td>
<td>36 H</td>
<td>[7 - 22] mg/dl</td>
<td></td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.8</td>
<td>[0.7 – 1.4] mg/dl</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>9.4</td>
<td>[8.5 – 10.5] mg/dl</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>144</td>
<td>[136 – 146] mmol/L</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>3.0 L</td>
<td>[3.5 5.3] mmol/L</td>
<td></td>
</tr>
<tr>
<td>Chloride</td>
<td>115 H</td>
<td>[98 – 108] mmol/L</td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>18 L</td>
<td>[20 – 32] mmol/L</td>
<td></td>
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</table>

Educational Objectives:
1. Develop a problem list.

2. Do you agree that the patient needed to be hospitalized? Why?
3. What is the most common, important cause of viral gastroenteritis in children worldwide? Is this patient’s presentation consistent with this infection?

4. What type of isolation should the patient be in while in the hospital? Why? What does that mean for healthcare providers.

5. Why does infection with this virus cause a watery diarrhea instead of a bloody diarrhea?

6. Correlate the clinical data with the basic metabolic panel results.

7. Which of the following methods are used to detect infection with this organism in the clinical care of patients?

   - Enzyme immunoassay
   - Electron Microscopy
   - Polymerase chain reaction
   - Virus isolation
8. Explain the usual clinical course and treatment for this infection.

9. The parents ask, “Can our baby get this infection again?” How would you answer?

10. Are other family members likely to acquire this infection?

11. Describe the vaccine(s) available to prevent this illness. Are there any major safety concerns regarding the vaccine? Are there contraindications to the vaccine?

12. Develop Hospital Admit Orders for this patient.
**Case History 2**  
Cc: “Our baby has been sick for the past several days”

The patient is a 6 month-old girl who presents in September with a fever of 102°F and irritability. Her parents have been unable to console her crying and she does not seem interested in taking her bottle. They have not noticed any other specific issues such as change in bowels, nausea, vomiting, cough, rhinorrhea. There are no known sick contacts. The baby was born full-term after a normal pregnancy. She has been healthy and achieving normal milestones. She is up to date with her vaccinations. She takes no medications. She has no known drug allergies. Her parents are healthy as is her 6-year old brother.

On exam her temperature is 102.0 °F, heart rate is 160 beats per minute, respiratory rate 30 breaths per minute, and blood pressure of 85/50. Her fontanels are normal and her neck is supple. The rest of her examination, including skin, ears, lungs, heart, abdomen, and nervous system, are unremarkable.

Urinalysis is normal  
Chest x-ray shows no areas of consolidation. 
Viral respiratory panel is negative. 
Blood cultures are drawn. 
A lumbar puncture is done.

**Laboratory Data**

<table>
<thead>
<tr>
<th>Glu &amp; Protein, CSF</th>
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</thead>
<tbody>
<tr>
<td>Glucose, CSF</td>
<td>62 [45-75] mg/dl</td>
</tr>
<tr>
<td>Protein</td>
<td>25 [15-45] mg/dl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spinal Fluid Cnt</th>
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</thead>
<tbody>
<tr>
<td>Volume 1.0 ml</td>
</tr>
<tr>
<td>RBC  0 [0] /ul</td>
</tr>
<tr>
<td>WBC  79 [0-8] /ul</td>
</tr>
<tr>
<td>Segs  72%</td>
</tr>
<tr>
<td>Lymphs 8%</td>
</tr>
<tr>
<td>Monos 20%</td>
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</tbody>
</table>

Serum glucose 82mg/dl

**EDUCATIONAL OBJECTIVES**

1. A decision is made by the admitting team to begin empiric antibiotics. Why? What antibiotics would you recommend?
Blood and CSF bacterial cultures were negative and antibiotics were discontinued on the second hospital day. Her symptoms improved and she was discharged on the third hospital day.

2. What is your final diagnosis? What is the most likely (common) etiology?

3. Can you confirm your clinical diagnosis by laboratory methods?

4. What is your recommended treatment?

**CASE HISTORY 3 – You are rotating in the acute care clinic as part of an M3 Clerkship and are seeing this patient**

Cc: Nothing has been physically “right” for the past week

The patient is a 32 year-old man who presents to an acute care clinic. About 7 days ago he had an abrupt onset of fever (maximum temperature 40°C), malaise, back pain, and nausea. His appetite is decreased. For the past 2 days he noticed his skin and eyes are turning yellow and his urine is dark. He has been previously healthy and denies having had these symptoms before.

On examination the patient’s skin and sclera are mildly icteric. There is no rash or lymphadenopathy. Lung and heart exams are normal. Abdominal examination reveals a tender liver, which is slightly enlarged. The spleen tip is nonpalpable.

**Remainder of questions and case data will be provided during the small group session**

**Cases 4, 5 – Data will be provided during the small group session**