MECHANISMS OF HUMAN DISEASE
AND
PHARMACOLOGY & THERAPEUTICS

CASE-BASED SMALL GROUP DISCUSSION

MHD II
SESSION VI

Friday, MARCH 20, 2015

STUDENT COPY

Resource for cases:
ACP Medicine (Scientific American Medicine) - Vaginitis and Sexually Transmitted Diseases (available as PDF linked to Small Group Session Calendar); Available e-book through Loyola Health Science Library
Case 1

CC: “It burns when I urinate” x 3 days

A 20 year-old man presents with the main complaints of burning with urination for 3 days and penile discharge. He denies a history of fever, chills, nausea, or abdominal pain. He denies ever having had such symptoms before. He states that he has had multiple female sexual partners within the last 6 months and does not consistently use condoms. He had sex with a new partner four days prior to the onset of symptoms. He has no chronic medical problems. He takes a vitamin daily.

On physical examination his oropharynx is normal. Bilateral testes and epididymis are normal. There are no penile ulcers. There is erythema at the urethral meatus with spontaneous purulent discharge. There is no inguinal lymphadenopathy.

Swabs of the urethral exudate are obtained. Gram stain reveals numerous polymorphonuclear leukocytes with intracellular Gram negative diplococci.

EDUCATIONAL OBJECTIVES

1. What is the clinical diagnosis? Why?

2. What microorganisms cause this condition?
How do the gram stain results help in determining the cause in this case?

3. Besides gram stain and culture, what are other diagnostic methods available to determine the etiology of the infection in this case?

The patient is administered ceftriaxone 125mg intramuscularly. He is instructed to avoid any sexual contact for 7 days following treatment (he is compliant) and is sent home. The patient notes improvement initially but one week later he returns to the clinic with persistent symptoms of dysuria and discharge. Physical examination is normal aside from urethral discharge.
Swabs of the urethral exudate are obtained. Gram stain reveals numerous polymorphonuclear leukocytes without intracellular Gram negative diplococci.

4. Now what is the likely diagnosis? What treatment regimen should be prescribed for this patient?

5. Should this patient undergo additional testing for any other infections? What advice should be given to him regarding his sexual partners?

6. What are the usual sites of infection with Neisseria gonorrhoeae in males? In females? What other sites may be infected?

7. Comment on the appropriateness (or inappropriateness) of prescribing each of the following antibiotics for uncomplicated gonorrheal infections:

   - Penicillin
   - Ceftriaxone
   - Ciprofloxacin

8. What is the reservoir of gonococcal disease in the population?

9. Review Case Image – Bacteriology, Set 14

Case 2:
CC: Fever and lower abdominal pain x 3 days
A 23 year-old woman presents with a complaint of fever of three days duration, nausea, and worsening lower abdominal pain. She rates the pain 8/10 at its worst. The pain seems worse in the right lower abdomen at times. She denies dysuria, hematuria, genital ulcerations, change in bowel habit, melena, or hematochezia. She has eaten little in the past 2 days. She is sexually active and has a new male partner. She uses oral contraceptives and does not regularly use condoms.

She has no medical problems, takes no prescribed medications, and has no allergies. She had a PAP smear done about 6 months ago which she reports to be “normal”. She does not smoke cigarettes, rarely uses alcohol, and denies illicit drug use. She works in a marketing firm.

On examination, she has a temperature of 39°C, pulse rate of 110 per minute, respiratory rate of 28 per minute, and B/P of 100/60. She is ill appearing and diaphoretic. Oral mucosa is dry; there are no oropharyngeal lesions. Heart and lung examinations are normal. There is no cervical, axillary, or inguinal lymphadenopathy. On abdominal exam there is diffuse lower abdominal tenderness with right lower quadrant tenderness to deep palpation. There is no rebound tenderness elicited. Bowel sounds are present but hypoactive. Her pelvic examination reveals right adnexal tenderness and cervical motion tenderness. The uterus is tender and slightly enlarged. Thick yellow vaginal discharge is sent for microbiological studies. The labia are normal. Rectal exam is normal and brown stool is occult blood negative. Skin exam reveals no rash.

**Educational Objectives**

1. Develop a differential diagnosis for fever and lower abdominal pain.

**Urine HCG** Negative  
Reference Range Negative

2. What diagnosis do you favor based on the given data? Explain the minimum clinical criteria needed to make this diagnosis.

3. Name the common pathogens implicated in this disease process.

4. How do microorganisms reach the upper genital tract?
Laboratory Data

Chlamydia Gc Probe (Final)

- Specimen: cervical
- Description: -cervical
- Special Requests: -none
- Culture Results: positive for neisseria gonorrhoeae by nucleic acid amplification
- Report Status: -final 08132003

5. Should this patient be admitted to the hospital? Develop a treatment plan for this patient?
   Complete the “Initial Drug Treatment for PID – Recommended regimens per CDC 2010 guidelines” table (at end of case) as an opportunity to review principles of antimicrobial therapy from Pharmacology/Therapeutics I course.

6. The patient asks “Am I going to have any permanent damage from this?”
   How would you answer?

7. During her hospital course the patient develops the sudden onset of severe right upper quadrant abdominal pain. The pain is referred to her right shoulder. Develop a differential diagnosis.

Table 1. Initial Drug Treatment for PID – Recommended regimens per CDC 2010 guidelines

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Drug class</th>
<th>Mechanisms of Action</th>
<th>Rationale for regimen (ie what</th>
</tr>
</thead>
</table>
Inpatient A:
Cefotetan or cefoxitin plus doxycycline

When tubo-ovarian abscess is present, *clindamycin or metronidazole* added to the regimen

Inpatient B:
Clindamycin plus gentamicin

Outpatient:
Ceftriaxone plus doxycycline with or without metronidazole

<table>
<thead>
<tr>
<th>Inpatient A: Cefotetan or cefoxitin plus doxycycline</th>
<th>organisms will be covered)</th>
</tr>
</thead>
<tbody>
<tr>
<td>When tubo-ovarian abscess is present, <em>clindamycin or metronidazole</em> added to the regimen</td>
<td></td>
</tr>
</tbody>
</table>

Which of the above antibiotics has a side effect of disulfiram-like reaction with alcohol?

Which has highest potential risk of nephrotoxicity?

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**Case 3:**
CC: painful sores in genital area
An 18-year old woman has a 3-day history of fever, headache and painful sores in the genital area. The patient has no previous history of genital lesions. Medical history is unremarkable and her only medication is an oral contraceptive agent. She does not use condoms. On physical examination, temperature is 38.1°C; other vital signs are normal. There are no signs of meningismus. Tender ulcerative lesions with a yellow crusted roof cover the labia bilaterally and the vaginal introitus.

Educational Objectives

1. Develop a differential diagnosis for the most common causes of sexually transmitted genital ulcers. Which do you suspect in this patient?

2. How could you confirm your diagnosis?

3. During or after the session, complete the table on genital ulcers that will be provided to you by your facilitator

“Case #4”

Beyond multiple choice
In this exercise, students are asked to think on their feet and answer open ended questions posed by student peers on material they have learned, as they will be asked to do on rounds (by residents and attendings) during their clerkships.

- Students are asked to each develop 1 question before the small group session which they will direct to the student sitting to the left or right of them (facilitator choice for the session).

- Questions are to be related to small group material (ie the organ system) from year 1 (anatomy, physiology, cell/molecular biology, immunology). So that questions have “relevance”, students are asked to derive the idea for their question from First Aid for USMLE Step 1, but further research/verify the question & answer via a text from their MS-1 year or another published text available through the LUHS library. Students should cite the resource(s) that they use and pages (when able from the online text).

For example, case 2 relates to the female genital tract.

Question: “The round ligament connects the uterus to which structure? (First Aid p. 563)

- **Answer: labia majora**

  Further Explanation: The round ligament of the uterus is a cord-like structure that passes from the uterus to the deep inguinal ring where it enters the inguinal canal. It passes down the inguinal canal and exits through the superficial inguinal ring. At this point, it has changed from a cord-like structure to a few strands of tissue, which attach to the connective tissue associated with the **labia majora** (source: Gray’s Anatomy for Students, Chapter 4)

The student who answered the question will then ask their question to the next student.

I anticipate that this exercise should take no more than ~10 minutes of the small group session.

We will continue this exercise for additional MHD small group sessions.

There will be an opportunity for students, who wish to do so, to post their questions/answers on Sakai for the class to share/review, particularly for USMLE preparation.