Sexually Transmitted Infections: A Case Based Approach

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The ABC’s of STDs

- Abstinence
- Barriers
- Contacts
- Drug Therapy
- Education & Counseling
STI/STD Resources

- CDC Home Page:
  - http://www.cdc.gov

- 2015 CDC STD Treatment Guidelines (on line):

- 2015 CDC STD Treatment Guidelines (paper):
  - MMWR 2015; Volume 64(3):1-140

- CDC Surveillance Data:
Case One:
A 24 year old female presents for a routine pelvic exam. She has had seven different partners but has not been sexually active for the past 6 months. She has no symptoms but your exam reveals the following:
Case One (continued):

Your microscopic exam of the discharge shows many PMNs but there are no clue cells or motile organisms on wet mount, and no yeast on a KOH prep. The lab reports no organisms on Gram stain but the nucleic acid amplification test is positive for *Chlamydia trachomatis*.
Question One:

You diagnose her with mucopurulent cervicitis due to chlamydia & prescribe:

A) Azithromycin 1 g po x one dose
B) Cefixime 400 mg po x one dose
C) Ciprofloxacin 500 mg po x one dose
D) Doxycycline 100 mg po x one dose
Therapy for *C. trachomatis*

- Azithromycin or doxycycline (effective > 97%)
  - Azithromycin 1 g po x 1 dose, *or*
  - Doxycycline 100 mg po bid x 7 days

- In pregnancy:
  - Azithromycin 1 g po x 1 dose
  - Repeat testing 3 weeks after completion of therapy
Chlamydia trachomatis

- Number one bacterial STD in the USA
  - > 1.5 million cases reported in 2015
  - CDC reports the US incidence to be 475.3 cases per 100,000 persons
- About 50% of men have symptoms
- 75% of women have no symptoms so they can transmit the organism to others

Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2015

NOTE: Data collection for chlamydia began in 1984 and chlamydia was made nationally notifiable in 1995; however, chlamydia was not reportable in all 50 states and the District of Columbia until 2000. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/chlamydia-trachomatis-infection/.
Chlamydia — Rates of Reported Cases by County, United States, 2015

NOTE: Refer to the NCHHSTP Atlas for further county-level rate information: https://www.cdc.gov/nchhstp/atlas/
Neisseria gonorrhoeae

- US incidence in 2015 was 124 per 100,000 persons
  - Over 395,000 new cases reported in 2015
- Risk of acquiring infection after a single exposure is 22 - 35%
- Reinfection occurs in > 40% of high-risk patients within one year of treatment

Gonorrhea — Rates of Reported Cases by Sex, United States, 2006–2015

Rate (per 100,000 population)

Year

CDC
Case Two:

A 17 year old male presents with a 2 day history of dysuria and urethral discharge. He is sexually active but has never had similar symptoms. Your exam reveals the following:
Question Two:

Your tentative diagnosis is:

A) Gonococcal urethritis
B) Nonspecific urethritis
C) Urethritis (uncertain etiology)
## Characteristics of Urethritis in Men

<table>
<thead>
<tr>
<th></th>
<th>Gonococcal Urethritis</th>
<th>Nonspecific Urethritis</th>
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</thead>
<tbody>
<tr>
<td><strong>Discharge</strong></td>
<td>Yellow or green, profuse</td>
<td>Grey or clear, mixed with mucous, slight</td>
</tr>
<tr>
<td><strong>Dysuria</strong></td>
<td>Severe</td>
<td>Mild-moderate; often intermittent</td>
</tr>
<tr>
<td><strong>Incubation Period</strong></td>
<td>$\leq 4$ days</td>
<td>7-14 days</td>
</tr>
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</table>
# Causative Agents

<p>| | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Gonococcal Urethritis</strong></td>
<td></td>
<td>▪ <em>Neisseria gonorrhoeae</em></td>
<td></td>
</tr>
<tr>
<td><strong>Nonspecific Urethritis (NSU)</strong></td>
<td>▪ <em>Chlamydia trachomatis</em> (15-40%)</td>
<td>▪ <em>Ureaplasma urealyticum</em> (15-25%)</td>
<td>▪ <em>Trichomonas vaginalis</em> (&lt;5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Herpes simplex (&lt;5%)</td>
<td>▪ Unknown (30%)</td>
</tr>
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</table>
Changing Face of NSU

- Case control study of 636 men in Australia
  - 265 cases and 299 matched controls
- NSU not associated with *U. urealyticum, U. parvum, or G. vaginalis*
- Viral etiology in men associated with oral sex and male partners

<table>
<thead>
<tr>
<th>Organism</th>
<th>% of cases</th>
<th>% with &lt; 5 WBC/oil field</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Chlamydia trachomatis</em></td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td><em>Mycoplasma genitalium</em></td>
<td>9</td>
<td>37</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td>HSV-1</td>
<td>2</td>
<td>44</td>
</tr>
</tbody>
</table>

[JID 2006; 193:336-45]
Case Two (continued):

You send a sample of the urethral discharge to the lab and the Gram stain shows the following:
Question Three:
Your choice of treatment is:

A) Doxycycline 100 mg po bid x 7 days
B) Ciprofloxacin 500 mg po x one dose
C) Ceftriaxone 250 mg IM x one dose
D) Cefixime 400 mg po x one dose
E) Ceftriaxone 250 mg IM x one dose and azithromycin 1 g po x one dose
Therapy for Gonorrhea

- Ceftriaxone 250 mg IM in a single dose, 
  \textit{Plus}
- Azithromycin 1 gram po in a single dose
Case Three:
A 17 year old female comes to your clinic to discuss contraception. She has been sexually active for about 1 year with 3 different partners. She has no symptoms and her exam is normal. Her vaccines are up to date.
Case Three (continued):

Because of her behavioral history, you counsel her about pregnancy and sexually transmitted infections.
Question Four:

Which screening tests are recommended by the US Public Services Task Force in this patient?

A) HIV alone
B) HIV and chlamydia
C) HIV, chlamydia and gonorrhea
Case Four:
As a result of the previous case, an 18 year old male partner of your other patient seeks your medical advice about screening for STIs in men. He has had 4 lifetime sexual partners. He has no symptoms, and his exam is normal.
Question Five:

Which screening tests are recommended for men by the US Public Services Task Force?

A) HIV alone

B) HIV and chlamydia

C) HIV, chlamydia, and gonorrhea
U.S. Preventive Services Task Force

[http://www.uspreventiveservicestaskforce.org/]
Screening for HIV Infection

- The USPSTF recommends screening for HIV infection in persons who are 15 to 65 years old
- Younger adolescents and older adults who are at increased risk should also be screened
- The USPSTF recommends that clinicians screen all pregnant women for HIV, including those who present in labor who are untested and whose HIV status is unknown
- Grade A recommendations

Screening for Chlamydia

- Annual screening of all sexually active women 24 years or younger
- Annual screening of women 25 years or older at increased risk for infection:
  - Previous sexually transmitted infection
  - New or multiple sexual partners
  - Inconsistent condom use
  - Sex work
- Insufficient evidence to recommend routine screening in asymptomatic men

[Annals Internal Medicine 2007; 147: 128-134]
Screening for Gonorrhea

- The USPSTF recommends screening all sexually active women < 25 years old for gonorrhea infection if they have one of the following risk factors:
  - History of previous gonorrhea or other STI
  - New or multiple sexual partners
  - Inconsistent condom use
  - Sex work or drug use
- Insufficient evidence to recommend for or against routine screening in men at increased risk for infection
- Recommend against screening men with no risk factors
Noninvasive Testing

- Systematic review of 29 studies that utilized nucleic acid amplification assays for *C. trachomatis* & *N. gonorrhoeae*

- Results of tests for *C. trachomatis* do not depend on presence of symptoms or sample site (urine versus cervix or urethra)

- Results of tests for *N. gonorrhoeae* do not depend on presence of symptoms; however, in this study the site mattered in women (avoid urine); nevertheless, several NAAT tests for urine in women are FDA approved in the United States

<table>
<thead>
<tr>
<th></th>
<th>Chlamydia in Women</th>
<th>Chlamydia in Men</th>
<th>Gonorrhea in Women</th>
<th>Gonorrhea in Men</th>
</tr>
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<tbody>
<tr>
<td><strong>PCR</strong></td>
<td>83.3%</td>
<td>84.0%</td>
<td><strong>55.6%</strong></td>
<td><strong>90.4%</strong></td>
</tr>
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Case Five:

A 21 year old female presents to an urgent care facility with nausea, fever, severe abdominal pain. She was in a monogamous relationship until about 6 months ago and has had 2 new sexual partners since that time.
Case Five (continued):

Examination reveals an ill appearing young woman with temperature of 101 degrees Fahrenheit, pulse of 136 and BP = 92/60. The cervix and adnexa are tender to palpation. A urine pregnancy test is positive.
Question Six:

Do you hospitalize the patient?

A) Yes

B) No
PID Diagnostic Criteria

- Uterine or adnexal tenderness
- Cervical motion tenderness

Note: Empiric therapy for PID should be initiated in sexually active women if the above criteria are present and no other cause can be identified.
PID: Causative Organisms

- N. gonorrhoeae
- C. trachomatis
- Anaerobes
  - Bacteroides species
  - Peptostreptococcus species
- M. hominis
- M. genitalium
- Aerobes
  - G. vaginalis
  - S. agalactiae
  - E. coli
  - H. influenzae
PID: Indications for Hospitalization

- Surgical emergency cannot be excluded
- Pregnancy
- Clinical failure of oral antimicrobial therapy
- Inability to follow or tolerate oral regimen
- Severe illness, nausea/vomiting, or high fever
- Tubo-ovarian abscess
PID: Inpatient Regimens

- Cefotetan 2 g IV q 12 hours, or
- Cefoxitin 2g IV q 6 hours

PLUS

- Doxycycline 100 mg po or IV q 12 hours x 14 days
PID: Outpatient Regimens

Ceftriaxone 250 mg IM single dose, or
Cefoxitin 2 g IM + Probenecid 1 g po (1 dose each)

PLUS

Doxycycline 100 mg po bid x 14 days

WITH or WITHOUT

Metronidazole 500 mg po bid x 14 days
PID: Complications

- Infertility
  - 15-24% with 1 episode

- Ectopic pregnancy
  - Risk increases 7x after 1 episode

- Chronic pain
  - Occurs in 18% of patients
Case Six:

A 32 year old male comes to your clinic with a 7 day history of fevers, malaise, and genital lesions. He states that he recently started to have oral sex with a new partner. To his knowledge, he has never had an STD.
Case Six:

Your examination reveals a man who looks moderately ill. His vitals are normal but he has several shotty tender lymph nodes along the right inguinal canal. There is no urethral discharge but he has several tender penile ulcers:
Question Seven:

What is your diagnosis?

A) Syphilis
B) Chancroid
C) Herpes simplex
Evaluation of Genital Ulcers

- Serology and direct immunofluorescence tests for *Treponema pallidum* (to look for syphilis)
- Culture or antigen (PCR) test for herpes simplex
- Type specific serology for herpes simplex virus
- In settings where chancroid is present, a test for *Haemophilus ducreyi*

[MMWR 2010; Volume 59 (RR-12), 1-110]
How to Distinguish the Genital Ulcer Diseases

- Chancroid
  - Tender, purulent, undermined border
- Syphilis
  - Painless, indurated, not purulent
- Herpes
  - Multiple, painful, shallow, and not purulent
Genital Herpes

- In the US, prevalence of HSV-II is 21.9% among persons 12 years of age or older
  whites (17.6%) < blacks (45.9%)
  men (17.8%) < women (25.6%)
- Independent predictors for seropositivity
  female sex, minority race, older age, poverty, less education, cocaine use, number of partners
  [NEJM 1997; 337: 1105-1111]
Genital Herpes Infections

- Most (70-90%) genital herpes lesions are due to Herpes Simplex Virus 2 (HSV-2)
- About 10-30% of genital herpes due to HSV-1
- Typical case might show crop of painful vesicles that ulcerate and eventually crust over without scarring
- Fever, malaise, myalgias, and very tender lymphadenopathy common in primary cases
Relative Proportion of HSV-1 vs. HSV-2 as a Cause of Genital Herpes, UW-Madison 1993-2001

Roberts CM, Sex Trans Dis Oct 2003;30(10)
Genital Herpes Infections

- Recurrences occur in 89% of persons with HSV-2 infections
- Recurrences precipitated by fever, sunlight, emotional stress, trauma, and menstruation
- Asymptomatic viral shedding occurs often and can be suppressed by antiviral therapy
- Confirm diagnosis with viral culture or type-specific serology
- Visible genital lesions at delivery → C-section regardless of duration of membrane rupture
Question Eight:

Which of the following do you prescribe?

A) No treatment, it’s too late to start
B) Acyclovir 400 mg po tid x 7 days
C) Acyclovir 400 mg po bid x 1 year
D) Acyclovir 400 mg po tid x 7 days and then 400 mg po bid x 1 year
Primary Genital Herpes

- Treatment will decrease:
  - Duration of viral shedding
  - Time to crusting of lesions
  - Duration of symptoms
  - Formation of new lesions after primary infection

[Medical Letter 1999; 41(1067):113-120] and
Therapy: Primary Genital Herpes

- **Acyclovir**
  - 200 mg, 5 per day x 7-10 days or
  - 400 mg po tid x 7-10 days

- **Famciclovir**
  - 250 mg po tid x 7-10 days

- **Valacyclovir**
  - 1 g po bid x 7-10 days
HSV-2 Recurrences

- Following initial infection, 89% of patients with HSV-2 had at least one recurrence during 391 days of follow-up.

- 316 patients with history of recurrent HSV-2 studied for a period of 12 months or greater.
  - 1st-year median yearly recurrence rate was 6.

- A subset of patients was followed for ≥ 5 years.
  - Recurrences declined to 3 per year by 5th year.
  - Subset (25%) had more recurrences in the 5th year than the 1st year.
HSV: Chronic Suppression (reduces recurrences by 70-80%)

- Acyclovir 400 mg po BID x 1 year, or
- Famciclovir 250 mg po BID x 1 year, or
- Valacyclovir 500 mg po q day x 1 year, or
- Valacyclovir 1000 mg po q day x 1 year
Expedited Partner Therapy

Thank you!!