STD epidemiology in NYC; focus on the adolescent

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Today’s talk

• Legal mandate to report
• NYC Sexually Transmitted Diseases (STD) control program
• Basic reproductive rate
• Epidemiology of the ‘Big Three’ (Chlamydia, Gonorrhea, Syphilis)
• Three “burning” issues
  — Expedited partner therapy for CT in NY State
  — Emergence of cephalosporin-resistant GC, new tx recommendations
  — EpiQuery: online STD data for NY City

Legal mandate to report

• By law, clinical laboratories and providers performing STD testing for NYC residents must report 7 STD to Bureau of STD Control
• Required:
  — Labs: patient name, dob, address, race/ethnicity, diagnosis, laboratory test result/date, submitting provider, provider address
  — Providers: information on the provider report form

Why are certain diseases/conditions reportable?

• Disease represents a significant public threat
  — Need for immediate public health response (Ex. meningococcal disease, anthrax)
• Public health response critical to preventing subsequent disease/injury control
  — Ex. Syphilis, HIV partner elicitation and notification
  — Ex. Outbreak, dangerous intersection, faulty device
• Occurrence of disease is a ‘sentinel event’
  — Represents failure of clinical management, public health interventions (Ex. Congenital syphilis)
• Monitor trends in behavior, identify groups with increased risk
  — Assess need for, direct resources for interventions, health communications
• Measure effect of interventions (Ex. vaccine campaigns, HA ART, screening coverage)

Who reports and how?

• Providers report using a case report form
  — On paper
    • ‘Universal report form (URF)’
  — By phone
    • Call Provider Access Line (PAL): 1-866-NYC-DOH1
    • Call 212-788-4423 and ask to speak with someone who can take an STD case report
  — Electronically
    • Contact Rugiatu Jalloh at rjalloh@health.nyc.gov or 347-396-6008 to arrange for training in web-based reporting
• Clinical laboratories report lab results electronically

No. cases reportable STD in NYC, 2011

<table>
<thead>
<tr>
<th>Pathogen/Disease</th>
<th>Total</th>
<th>Female</th>
<th>Male (%)</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia trachomatis (CT)</td>
<td>64,666</td>
<td>43,682</td>
<td>21,206</td>
<td>(33)</td>
</tr>
<tr>
<td>Neisseria gonorrhoeae (GC)</td>
<td>14,403</td>
<td>6,303</td>
<td>8,076</td>
<td>(56)</td>
</tr>
<tr>
<td>Treponema pallidum (All stages)</td>
<td>3,948</td>
<td>549</td>
<td>3,376</td>
<td>(85)</td>
</tr>
<tr>
<td>P&amp;S</td>
<td>694</td>
<td>23</td>
<td>670</td>
<td>(97)</td>
</tr>
<tr>
<td>Early Latent</td>
<td>1,104</td>
<td>99</td>
<td>1,002</td>
<td>(91)</td>
</tr>
<tr>
<td>Latent (late, unknown duration)</td>
<td>1,938</td>
<td>427</td>
<td>1,504</td>
<td>(78)</td>
</tr>
<tr>
<td>Congenital</td>
<td>12</td>
<td>5</td>
<td>7</td>
<td>(66)</td>
</tr>
<tr>
<td>Chancroid</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Granuloma inguinale (GI)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Lymphogranuloma venereum (LGV)</td>
<td>37</td>
<td>0</td>
<td>37</td>
<td>(100)</td>
</tr>
<tr>
<td>Neonatal herpes (nHSV)</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>(66)</td>
</tr>
<tr>
<td>HIV (w/ and w/o AIDS, 2010)</td>
<td>3,498</td>
<td>856</td>
<td>2,718</td>
<td>(78)</td>
</tr>
</tbody>
</table>

* Locally, but not nationally notifiable
* Annualized based on data through 6/30/2011. Estimated 111,949 persons living with HIV/AIDS in NYC as of 06/30/2011
**Bureau of STD Control**

**Key components/functions**
- Surveillance and epidemiology
- Clinical service delivery
- Partner services
- Community Outreach

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**Surveillance and epidemiology unit**
- Enter, tabulate and analyze reports of STD and examine trends
- Conduct special studies

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**Clinical service delivery**
- Bureau runs 9 STD clinics throughout NYC
  - ~115,000 patient visits per year
  - ~80,000 HIV tests per year
- Accessibility of clinics
  - Free, confidential
  - Patients seen without regard for immigration status/insurance
  - Children ≥12 entitled to care without parental consent
  - Bilingual staff (Spanish, English)
  - Language line for all other languages
  - Expanded hours (Saturday clinic) in each Boro

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**Partner services/management**
- Partner elicitation: Process of eliciting names and locating information for persons who may have been sexually exposed to STD
- Partner notification: Seeking persons sexually exposed to STD, informing them of exposure, providing testing and treatment
- Partner management done for:
  - Infectious syphilis, lymphogranuloma venereum reported in NYC
  - HIV diagnosed in Bureau clinics, or upon request
  - Select cases of gonorrhea (w/ evidence of decreased susceptibility to cephalosporins)
  - NOT done for chlamydia
- Interview, re-interview

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**Community outreach**
- CBO Unit
  - Linkage agreements with CBO’s
  - Contact: Millicent Freeman
- Infertility Prevention Program (chlamydia and gonorrhea screening in family planning, juvenile detention)
- Prevention Training Center – provider training
- School screening program
  - Contact: Meighan Rogers

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**Transmission**
- What determines the sustainability of transmission/shape of an epidemic?
- Basic reproductive number ($R_0$)
  - Average number of secondary cases generated by one primary case in a population of sexually active persons
  - $R_0 = 1$ No net increase in infection
  - $R_0 < 1$ Decline in infections
  - $R_0 > 1$ Increase in infections
Transmission

- Basic reproductive rate ($R_0$)
  \[ R_0 = \beta c D \]

$\beta$ Probability of transmission per contact with sex partner
$c$ Rate of sex partner change
$D$ Duration of infectiousness

Chlamydia trachomatis

Case rate (per 100,000 population) of Chlamydia trachomatis reported to the New York City DOHMH, with percent reported from Bureau of STD clinics, 2000-2010, by sex

Male Chlamydia Cases Reported to NYC DOHMH, by provider type: Jan – June for Years 2004-2006

Chlamydia reported to the NYC DOHMH. Case rates (per 100,000 population) by age and sex*, full year 2011

*Excludes persons for whom sex or age were not reported
Repeat Ct infection in NYC, 2009

- >53,000 persons reported w/ Ct in 2009
- Repeat infection: Ct infection >30 days and <12 months after initial infection
- 14.2% people had repeat infection
- 16.1% of women (5,818/36,094)
- 10.3% of men (1,791/17,377)

Need to improved CT partner management

- High rates of repeat *Chlamydia trachomatis* (Ct) infection 4-6 mos after tx
- Repeat Ct infection ↑ risk for sequelae
  - pelvic inflammatory disease, chronic pelvic pain, ectopic pregnancy, infertility
- Many female re-infections attributable to resuming sex with an untx’ d sex partner
- Low tx rates for male partners to Ct
- Need for innovation and improvement in partner management
What is Expedited Partner Therapy (EPT)?

- A partner management strategy to tx sex partners of patients diagnosed w/ Ct
- Clinician provides medication or prescription to patient, who brings it to his/her partner(s)
- Partner tx given without the health care provider first examining the sex partner

What are the benefits of EPT?

- Compared to patient (self) referral, EPT:
  - Decreases re-infection in index patient
  - Increases proportion sex partners tx’d
  - Gets tx to sex partners unlikely to seek care

What is the legal status of EPT in NYS?

EPT legal in NYS for Chlamydia

- Law passed January 2009
- Regulations adopted October 2010
- Provider guidelines finalized March 2011

Summary of EPT law

- Permissible for Chlamydia (Ct) only
- Ct may be lab-confirmed or presumptive/clinical dx
- HCP may dispense medication, or prescription
- HCP protected from liability
- Regulations specify how to practice EPT
- EPT law expires 2014

EPT regulations

Summary

- Do not use EPT if index co-infected w/ GC or syphilis
- Requires EPT informational materials be provided for patient to give partner
  - HCP must counsel patient to tell partner that it is important to read said materials before taking medication
  - Specifies content of informational materials
- Specifies prescription format
- Specifies Ct reporting requirements

Informational materials

Materials shall:
(1) Encourage partner to consult HCP for full eval as preferred alternative to EPT & regardless of whether take med
(2) Disclose risk of potential adverse drug reactions/ interactions
(3) Inform partner possible co-morbidity - could go untx’d
(4) Inform partners - seek care if sx of more serious infection
(5) Recommend partner who could be pregnant consult HCP asap
(6) Instruct patient and partner to abstain >= 7 days after each tx’d to avoid reinfection
(7) Inform partner at high risk for HIV to consult HCP for full eval and HIV/STD testing
(8) Inform patient and partner how to avoid repeat Ct

NYC DOHMH has developed informational materials which contain the required information. Available for download at the NYC DOHMH EPT website: www.nyc.gov/health/ept
EPT regulations

Prescription format

(1) Designation “EPT” must be written in body of script

(2) Name, address, DOB of sex partner should be written in designated section if available

(3) If name, address, DOB of sex partner not available, the written designation “EPT” shall be sufficient for a pharmacist to fill the prescription

EPT regulations

Reporting requirements

(1) EPT law and regulations do not affect obligation to report Ct to local DOH (requirement remains)

(2) Reports of cases of Ct provided with EPT shall include the designation “EPT” plus the no. of sex partners for whom a prescription or medication provided

Resources

NYC DOHMH EPT Webpage: www.nyc.gov/health/ept

Key materials available:

- Law
- Regulations
- Dear colleague letter from Commissioners of Health
- Provider guidelines
- Pharmacist FAQ
- Patient information
- Partner information
- EPT brochure for HCP
- Links to other sites, including CDC, White paper

Neisseria gonorrhoeae

Gonorrhea rates, by sex
New York City, 1995-2012

Case rates for 2012 calculated with annualized data calculated using first 6 months of 2012
Emergence of cephalosporin resistance among Neisseria gonorrhoeae (GC)

Minimum inhibitory concentration

- **Minimum inhibitory concentration** (MIC): lowest concentration of an antimicrobial that will inhibit the growth of microorganism after overnight incubation.
- A lower MIC indicates that an organism is susceptible to an antibiotic, a higher MIC indicates that the antibiotic might not successfully treat an infection.
Emergence of cephalosporin resistance among Neisseria gonorrhoeae (GC)

- Neisseria gonorrhoeae (GC) - resistance to multiple classes of antibiotics
  - Penicillin, Tetracyclines
  - Fluoroquinolones in mid-2000's
  - Azithromycin resistance emerging
  - Cephalosporins – only drug class rec'd for GC treatment

- Cephalosporin tx failures reported from Asia, Europe, now Canada

- Gradual increases in minimum inhibitory concentrations (MIC) ‘creep’ observed in the US (seen both nationally and locally)
  - MSM isolates disproportionately represented among GC w/ elevated MIC

- MIC of cephalosporins which correspond to resistance have not been established (only “susceptible” and “decreased susceptibility”)

- Nucleic acid amplification tests (NAAT) supplanting culture; current NAAT do not provide information on antibiotic resistance

Clinical Laboratory Standards Institute (CLSI)*

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC value interpretive standard (ug/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>≤0.250</td>
</tr>
<tr>
<td>Cefixime</td>
<td>≤0.250</td>
</tr>
</tbody>
</table>

Susceptible to Decreased susceptibility

*CDC uses Ceftriaxone (≥0.125 ug/ml) and Cefixime (≥0.250 ug/ml) as thresholds for decreased susceptibility

CDC guidelines issued August, 2012*

CDC recommended treatment for uncomplicated urogenital, anorectal, and pharyngeal GC:

- Ceftriaxone 250 mg IM
  - AND
  - Azithromycin 1 gram orally

As combination therapy for GC

*Data from the CDC Gonococcal Isolate Surveillance Project

MIC creep in the US, 2006-2011*

- The % GC isolates with elevated MIC of cefixime is increasing:
  - Nationally: 0.1% → 1.5%
  - Among MSM nationally: 0.2% → 3.8%
  - Western US: 0.2% → 3.2% (MSM, 0.1% → 4.5)
  - Northeastern and South: 0.1% → 0.3% (MSM, 0.6% → 1.5%)

- Elevated MIC of cefixime less common:
  - Nationally: 0.0% → 0.4%
  - Among MSM nationally: 0.0% → 1.0%

*CDC guidelines issued August, 2012

- Combination therapy for GC
  - Use even if CT NAAT is negative
  - No clinical data available to support dosing >250 mg Ceftriaxone
  - May substitute doxycycline 100 mg po BID X 7 days for Azithromycin 1 gram
  - Azithromycin preferred to Doxy: compliance advantages of single dose, and high prevalence of tetracycline resistance among GC

Cefixime (at any dose) no longer recommended for treating GC

- If cefixime must be used:
  - Give as combination therapy (Cefixime 400 mg + azithromycin or doxy)
  - Obtain culture w/ AST (which includes cefixime) before treating, or
  - perform a test-of-cure at 1 week

- If cephalosporins cannot be used, tx w/ Azithromycin 2 grams
  - Obtain culture w/ AST (which includes azithromycin) before treating, or
  - perform a test-of-cure at 1 week

- IMPORTANT:
  - If culturing before treating, make sure that culture AST includes the drug used to tx
  - GC NAATS can be used for 1 week test of cure
Watch for treatment failures!

- Treatment failure:
  - Persistent symptoms after treatment (with no interval sexual exposure), or
  - Positive GC NAAT or culture at 1 week test of cure visit (with no interval sexual exposure)
- Report possible treatment failures to NYC DOHMH
  - Julie Schillinger at jschilli@health.nyc.gov or (347) 396-7296

Managing a patient with possible treatment failure

- Treatment failure after recommended GC tx regimen:
  - Obtain culture w/ AST* from appropriate sites
  - Consult Infectious Disease expert, STD/HIV Prevention Training Center (http://www.nnptc.org) or CDC (404-639-8659) for treatment advice
  - Notify DOHMH (Julie Schillinger)
  - Test of cure 1 week after retreatment
  - Ensure sex partners from 60 days before infection are evaluated promptly and treated as indicated

- Treatment failure after alternative GC tx regimen:
  - Obtain culture w/ AST* from appropriate sites
  - Treat with Ceftriaxone 250 mg + Azithromycin 2 grams
  - Consult Infectious Disease expert
  - Notify DOHMH (Julie Schillinger)
  - Test of cure 1 week after retreatment
  - Ensure sex partners from 60 days before infection are evaluated promptly and treated as indicated

  (If allergies preclude use of regimen above, consult with ID expert before treating)

*For culture to be useful for guiding tx, AST testing must include drugs used to tx

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Laboratory issues of concern to providers

- NAAT purporting to identify genetic determinants of resistance not validated
- Not all labs do AST, and those that do, may not include key antibiotics of interest in their panel
- AST testing should be done with disk diffusion method (provides results in ug/ml, that translate directly to MICs)
- Isolates with elevated MICs of cephaplosporins may not be resulted as “resistant” because no CLSI standards for thresholds
- Labs should hold specimens with unusual results, but may fail to do so
- Labs should send isolates with reduced susceptibility to cephaplosporins to NYC DOHMH Public Health Lab, but may fail to do so

Syphilis

Reported Primary and Secondary (P&S) Syphilis
New York City, 1940-2011

Rate/100,000 population

Year
Where do male P&S syphilis cases meet sex partners?*

<table>
<thead>
<tr>
<th>Venue</th>
<th>n/N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet only</td>
<td>58/177 (33)</td>
</tr>
<tr>
<td>'Other' only</td>
<td>20/177 (11)</td>
</tr>
<tr>
<td>Bars only</td>
<td>14/177 (8)</td>
</tr>
<tr>
<td>Clubs only</td>
<td>9/177 (5)</td>
</tr>
<tr>
<td>Street only</td>
<td>8/177 (5)</td>
</tr>
<tr>
<td>Internet + any other venue</td>
<td>86/177 (49)</td>
</tr>
</tbody>
</table>

*425/562 (76%) P&S cases interviewed; 177 (42%) reported 2 venue. Jan-Aug, 2011

EpiQuery for STD

• NYC STD surveillance data, 2000-2009 now available on line at:

  https://a816-healthpsi.nyc.gov/epiquery/EpiQuery/