Chlamydia and Gonorrhea Infections in Child Sexual Abuse

CHAMP WEBINAR

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Objectives

- Become acquainted with Chlamydia and Gonorrhea and the association with sexual abuse
- Discuss testing and treatment for these infections
- Discuss interpretation of positive and negative results in the patient and potential perpetrators

Implications of Commonly Encountered STIs for Diagnosis and Reporting of Suspected or Diagnosed Sexual Abuse of Children

STI Confirmed	Sexual Abuse	Suggested Action
Gonorrhea[1]	Diagnostic	Report
Syphilis[1]	Diagnostic	Report
HIV	Diagnostic	Report
Chlamydia[1]	Diagnostic	Report
Trichomonas	Highly suspicious	Report
Condyloma accuminata[1]	Suspicious	Report
Herpes[2]	Suspicious	Report
Bacterial vaginosis	Inconclusive	Medical Follow-up

[1] If not perinatally acquired and rare nonsexual vertical transmission is excluded

[2] Unless there is a clear history of autoinoculation

AAP Red Book, 2006

STD prevalence in sexual abuse

- Girardet et al (2009): 536 kids 0-13 yrs old
  - GC 3.3% (16/483)
  - CT 3.1% (15/482)
  - Syphilis 0.3% (1/384)
  - HSV 42% (5/12 with lesions)
  - HPV not specified
- Sexually abused **adolescents'** rates much higher!

Girardet et al (2009) Pediatrics 124:79-86

Whom to test?

- "The decision to obtain genital or other specimens from a child to conduct an STD evaluation must be made on an individual basis." *MMWR/CDC STD Treatment Guidelines*, 2010
- Age of child (pre or post pubertal), length of time since last contact, presence or absence of symptoms, "risk" of the situation, will all need to be weighed.

What type of test to do?

- Culture
  - Direct identification of organism
  - Good specificity (test negative with no disease)
  - Sensitivity sometimes low (may test negative even if they have disease)
    - Adequate specimen
      - Endocervical for CT
    - Experienced lab
      - Fewer using culture now with rise of quicker tests in adult population

Specificity and sensitivity

- Specificity
  - How good the test is at identifying people who do not have disease
  - High specificity = test negative with no disease
    - Tradeoff is false negative so some people that actually have disease will test negative
- Sensitivity
  - How good is the test at identifying people who have the disease
  - High sensitivity = test positive with disease
    - Tradeoff is false positive so some people that don't have disease will test positive

Types of tests

- NAA testing (NAAT)
  - Amplify nucleic acid sequences that are specific for the organism being detected
  - Do not require viable organisms
  - Increased sensitivity from ability to produce a positive signal from a single copy of target DNA or RNA
    - Tradeoff risk is false positive
  - Swab or "dirty" urine

Centers for Disease Control and Prevention. Screening to detect Chlamydia trachomatis and Neisseria gonorrhea infections – 2002. MMWR Recomm Rep. 2002;51 (RR-15):1-38.

NAAT

Sequence Technique	Test Name
Polymerase Chain Reaction (PCR)	Roche PCR™
Transcription Mediated Amplification (TMA)	Aptima Gen-Probe™
Strand Displacement Amplification (SDA)	BD-Probe™
Ligase Chain Reaction (LCR)	*Not on market*

NAAT

- Black *Peds Inf Dis Journal* 2009;28
  - Multicenter study on using NAAT's for detection of gonorrhea and chlamydia in children being evaluated for sexual abuse
  - Sensitivity for urine NAAT 100 % compared to vaginal culture
  - **"NAAT's offer clear advantage over culture in sensitivity and are less invasive than swabs which reduces patient discomfort/trauma"**

N = 485 girls

NAATs and CDC

- NAATs can be used as an alternative to culture for chlamydia and gonorrhea with vaginal specimens or urine from ***girls***
- Culture remains preferred method for urethra or urine from boys and for extra-genital specimens (pharynx and rectum) from all children.
- All positive specimens should be retained for "additional testing."

CDC STD guidelines, 2010 p. 94-95

NAAT Confirmation

Black, 2009

- What is "additional testing" listed in CDC guidelines?
- "we recommend that confirmation testing (eg, by ***alternate target*** NAATs) be routinely performed for pediatric forensic populations."

What sites to test?

	Gonorrhea	Chlamydia	Trich
Oral/Throat	Culture	X	X
Boys: *Urethra*	*Culture*	*Culture*	*Culture*
Girls: Vagina Dirty urine	Culture or NAAT	Culture or NAAT	Culture or NAAT
Rectal	Culture	Culture	X

When to test?

- Do NOT test all children
  - Low yield
  - Expensive
- Do test when
  - Genital-genital contact (not by another pre-pubertal child)
  - Signs of infection
  - Vaginal discharge AND
- Contact was relatively recent (months)
  - Most infections resolve
  - Exceptions: Chlamydia, HIV, syphilis

Do test when

- Genital-genital contact
  - Not by another prepubertal child
- Signs of infection
  - Discharge, dysuria, proctitis
- Relatively recent (months)
  - Most infections resolve
- High risk contact
  - Offender known to have STD
  - Higher risk for HIV, syphilis

When to test - Serology?

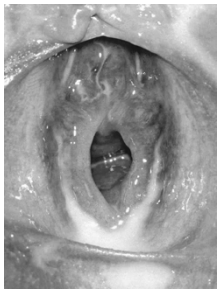
- Serology-HIV, Hepatitis B/C, Syphilis
  - Baseline
  - 3 months after most recent exposure
    - HIV and Syphilis screen (RPR or VDRL)
    - Hepatitis B
      - Immunization has decreased risk but coverage is not universal
    - Hep C IF high risk assault
      - Offender with HIV, hepatitis, jail, drugs…
  - 6 months after most recent exposure
    - Repeat HIV and Syphilis screen

When to treat?

- **Pre-pubertal patients:**

- Do not treat presumptively
  - Can use prophylaxis if situation is high risk
    - AAP Red Book, 2006
  - Low prevalence of STDs in CSA (2-4%)
  - Low risk of ascending infection
  - Follow-up can usually be assured
  - Antibiotics will hinder further testing
  - Powerful evidence!

H flu vaginitis



When to treat?

Post-pubertal patient:

- Provide prophylaxis to this population after acute assault (in contrast with pre-pubertal patients) because of:
  - High prevalence of pre-existing infection
    - Prevalence of STIs is 24-36 % in this population depending on prior sexual activity (Kawsar, *STI*, 2004)
  - Risk of ascending infection in females
  - Poor follow-up

Prophylaxis after sexual victimization

- Gonorrhea
  - Ceftriaxone IM,
  - As of August 2012, the CDC is no longer recommending oral Cefixime for treatment of uncomplicated GC based on serious problem of emerging resistance!
- Chlamydia
  - Azithromycin, Doxycycline
- Trichomonas
  - Metronidazole
- Hepatitis B
  - Complete or start immunization series
- HIV
  - PEP guidelines available from CDC

Recommendations for GC treatment in children

Recommended Regimen for Children Who Weigh >45 kg

Treat with one of the regimens recommended for adults (see Gonococcal Infections)

Recommended Regimen for Children Who Weigh ≤45 kg and Who Have Uncomplicated Gonococcal Vulvovaginitis, Cervicitis, Urethritis, Pharyngitis, or Proctitis

Ceftriaxone 125 mg IM in a single dose

Test of Cure (TOC)

- NAAT should not be used for test of cure sooner than 3 weeks post treatment
- TOC should be considered for:
  - Gonorrhea treated with Cefixime
  - All positive chlamydia tests

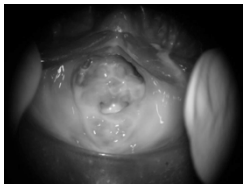
What does the CDC say about NAATs and Chlamydia?

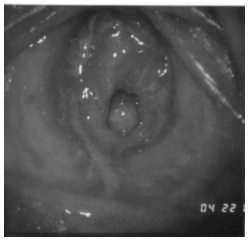
- "NAATs can be used for detection of *C. trachomatis* in vaginal specimens or urine from girls. All specimens should be retained for additional testing if necessary. No data are available regarding the use of NAATs in boys or for extragenital specimens (e.g., those obtained from the rectum) in boys and girls. Culture remains the preferred method for extragenital sites."

What does the CDC say about NAATs and GC?

- "Data on use of NAATs for detection of *N. gonorrhoeae* in children are limited, and performance is test dependent (*197*,*486*). Consultation with an expert is necessary before using NAATs in this context to minimize the possibility of cross-reaction with nongonococcal *Neisseria* species and other commensals (e.g., *N. meningitidis*, *N. sicca*, *N. lactamica*, *N. cinerea,* and *Moraxella catarrhalis*). NAATs can be used as an alternative to culture with vaginal specimens or urine from girls, whereas culture remains the preferred method for urethral specimens or urine from boys and for extragenital specimens (pharynx and rectum) from all children. All positive specimens should be retained for additional testing."

N. gonorrhea vaginitis





Gonorrhea

- Can infect vagina/urethra, anal mucosa, oral mucosa, eye mucosa
- More likely to produce symptoms than chlamydia infection
  - Discharge, dysuria, abdominal pain…
  - Post-pubertal girls can have ascending infection leading to PID (unlikely in prepubertal)
  - Systemic/disseminated infection in girls or boys can cause infective arthritis (unlikely in prepubertal)
- If positive test, also treat for chlamydia if sexually active

Gonorrhea

- What if you share a towel with someone who has gonorrhea?
  - "Gonococci have been recovered from pus on linen kept moist with sterile saline after 5 hours and in 1 case after 22 hours"
  - "Gonococci could not be recovered by culture after 2 hours if the cloth was kept dry"

"Towels and linen soiled with gonorrheal pus may recover contagion as long as the pus has not dried up."

Goodyear-Smith F. What is the evidence for non-sexual transmission of gonorrhea in children after the neonatal period? A systematic review. Journal of Forensic and Legal Medicine. 2007;14:489-502.

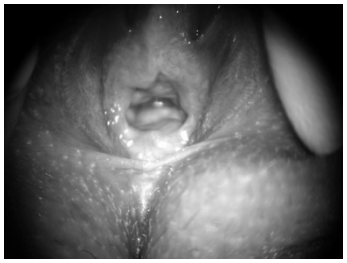
Gonorrhea

- Can you get it from a toilet seat?

  - 72 random swabs from public toilets did not grow any N gonorrhea
  - Suspensions of N gonorrhea inoculated on toilet seats and toilet paper did not survive after inoculants had dried (< 10 minutes)
  - Gonococci in purulent suspensions could be recovered from toilet seat and toilet paper 2-3 hours later

Goodyear-Smith F. What is the evidence for non-sexual transmission of gonorrhea in children after the neonatal period? A systematic review. Journal of Forensic and Legal Medicine. 2007;14:489-502.

Sibling of child with gonorrhea



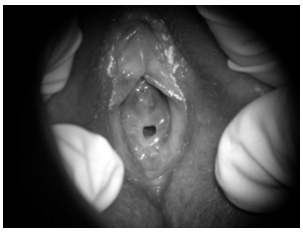
She tested positive too by culture but didn't have discharge

Chlamydia

- Sexually transmitted to vagina/urethra and anal mucosa
  - Most common bacterial STD in U.S.
  - Often asymptomatic
    - Risser, *Peds ID*, 2005
  - Intracellular organism so culture must contain CELLS (which is why NAAT is more sensitive)
- Incubation variable, min 7 days
  - Duration may be months to years ?
- PID develops in as many as 30% untreated adolescent cases

Chlamydia

- May have a watery or yellow discharge, but often no visible symptoms when tested.
- This 7 year old girl was vaginal culture positive for chlamydia. Disclosed abuse by male adult.



Chlamydia

- Why don't we test the throat in children?
  - Yield is low
  - Perinatally acquired infection may persist beyond infancy
  - Culture systems in some laboratories do not distinguish between C. trachomatis and C. pneumoniae

Darville T. Chlamydia trachomatis infections in neonates and young children. Semin Pediatr Infect Dis.2005;16:235-244.

Joyce Adams Classification System

- Derived from peer reviewed literature and reflects consensus among experts and addresses issues where there is no consensus
- 2011 Update published in Journal of Child Sexual Abuse, 20; 588-605
- What does it say about these two infections?

Findings Diagnostic of Trauma and/or Sexual Contact

- " The following findings support a disclosure of sexual abuse; if one is given and are highly suggestive of abuse even in the absence of a disclosure unless a clear, timely and plausible description of an accidental injury is provided by the child and/or caretaker."
- "Presence of Infection Confirms Mucosal Contact with infected and infectious bodily secretions; contact most likely to have been sexual in nature."

- "Positive confirmed culture for gonorrhea, from genital area, anus or throat in a child outside of the neonatal period.:
- "Positive culture from genital or anal tissues for chlamydia, if child is older than 3 years at the time of diagnosis and if specimen was tested using cell culture or comparable method approved by the CDC."

Why is the perp negative if tested when the victim is positive?

- Treated anonymously at HD
- Time since acquisition
  - Delay in disclosure by child victim
- Spontaneous clearance
  - Parks 1997 study on clearance of chlamydia infection without treatment:
    - 25% after 4- 20 days
    - 60% 21- 45 days
- Specimen not collected or processed correctly
  - False negative

Other STI References

- Girardet, Epidemiology of STI's in suspected child victims of sexual assault. *Pediatrics*, 2009 vol 124.
- Bechtel, Sexual abuse and STI's in children and adolescents. *Current Opinions In Pediatrics*, 2010 vol 22(1).
- Hammerschlag, Medico-legal implications of testing for STI's in children. *Clinical Microbiology Review*, 2010 vol 23(3).