FAQs About Sexually Transmitted Infections in Child Abuse Cases

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Disclosures

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Have Nothing to Disclose

Webinar Today

- Review recommendations for STI testing in children when sexual abuse is suspected
- Analyze cases in which an STI test result was positive

FAQs

- What are the criteria for testing a prepubertal child for STIs?
- Can we use NAATs to test for STIs in children?
- Which tests for STIs are recommended?

Why Examine?

- Reassurance
- Physical findings, especially if close to the time of sexual contact
- Treat injuries
- Sexually transmitted infections

When?

- Can test for STI's at any time after suspected sexual contact.
- Early testing may result in a positive identification due to perpetrator secretion and not true infection.
- Follow-up testing in 1-2 weeks after the incident is often performed. Tests of cure are not recommended. (More about this later in this talk.)

What are the Criteria for Testing a Prepubertal Child for STIs?

Latest research
CDC Guidelines

Chlamydia

A case of a young girl with a positive C. trachomatis test result

Jamie Hoffman-Rosenfeld, MD

History

- 12 ½ year-old girl was referred for a medical sexual abuse evaluation.
- She reported abuse by the aunt's boyfriend, including penis ->mouth and penis ->genitalia.
- Last incident was about 5 months before; he has been incarcerated since that time.
- Mother was aware that he had been diagnosed with Chlamydia.

Tests Sent

- Urine NAAT
- Vaginal swabs for Chlamydia trachomatis, Trichomonas vaginalis, Neisseria gonorrhea
- Anal swabs for Chlamydia and Gonorrhea
- Pharyngeal swab for Gonorrhea
- Serology for HIV, Hep B SAg, Hep C Ab, and RPR

Criteria for Testing: History

- Child abused by a stranger (as in abductions)
- Abuse by person with STI or high risk for STI
- Sibling or other relative with STI
- High prevalence of STI in the community

Jenny C, Crawford-Jakubiak JE, and Committee on Child Abuse and Neglect. The evaluation of children in the primary care setting when sexual abuse is suspected. *Pediatrics*. 2013; 132; e558.

Criteria for Testing: Child Specific History

- Child experienced penetration of genitalia and/or anus
- Child has signs of STIs, such as vaginal discharge
- Child has a history of STI(s)

Jenny C, Crawford-Jakubiak JE, and Committee on Child Abuse and Neglect. The evaluation of children in the primary care setting when sexual abuse is suspected. *Pediatrics*. 2013; 132; e558.

Test Results

Urine nucleic acid amplification positive for Chlamydia trachomatis; confirmed by outside lab.

Chlamydia trachomatis

- Most common reportable STI in US
- Obligate intracellular bacteria with many serovars
- Often asymptomatic
- Can persist without treatment for long periods
- Can be transmitted perinatally (According to AAP Redbook, perinatal vaginal or anal infection resolves spontaneously by 16-18 months of age.)

2010 CDC Treatment Guidelines for C. trachomatis

- Anal cultures:
  - Cultures for C. trachomatis from specimens collected from the anus in both boys and girls.
- Urethral cultures:
  - The likelihood of recovering C. trachomatis from the urethra of prepubertal boys is too low to justify the trauma involved in obtaining an intraurethral specimen.
  - A meatal specimen should be obtained if urethral discharge is present.
  - Vaginal cultures recommended in prepubertal girls.
- Pharyngeal specimens: for C. trachomatis
  - Not recommended for children of either sex because the yield is low.

2010 CDC Treatment Guidelines for C. trachomatis

- Perinatally acquired:
  - Infection might persist beyond infancy.
  - Culture systems in some laboratories do not distinguish between C. trachomatis and C. pneumoniae.
  - Only standard culture systems for the isolation of C. trachomatis should be used.
  - The isolation of C. trachomatis should be confirmed by microscopic identification of inclusions by staining with fluorescein-conjugated monoclonal antibody specific for C. trachomatis.
  - EIAs are not acceptable confirmatory methods.

2010 CDC Treatment Guidelines for C. trachomatis

- Nonculture tests for chlamydia (e.g., nonamplified probes, EIAs, and DFA):
  - Not sufficiently specific for use in circumstances involving possible child abuse or assault.
- **NAATs can be used for detection of C. trachomatis in vaginal specimens or urine from girls. All specimens should be retained for additional testing.**
  - 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.

Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused

Adams JA, Kellogg ND, Farst KJ, Harper NS, Palusci VJ, Frasier LD, Levitt CJ, Shapiro RA, Moles RL, Starling SP. Updated guidelines for the medical assessment and care of children who may have been sexually abused. *Journal of Pediatric and Adolescent Gynecology.* (2015). doi: 10.1016/j.jpag.2015.01.007.

Manuscript accepted for publication.

Can We Use NAATs to Test for STIs in Children?

What does the literature say?

Culture Vs. NAAT

- Culture has been the gold standard but is costly and has low sensitivity (as low as 20% in prepubertal girls).
- NAATs, which have been used for years in older sexually active populations, demonstrate better sensitivity, ease of collection and lower costs.
- Though not licensed for use in prepubertal children, they have been studied by Black, et al., and the CDC treatment guidelines allow their use in girls.
- When NAATs are used to diagnose infection in prepubertal children or older children in which the result could have significance in legal proceedings, confirmatory testing should be performed to exclude a possible false positive result.

A False Positive NAAT for C. trachomatis

How can we be "sure?"

Ann Botash, MD

Case

- A 5 year-old girl with speech delay comes home from a visit with the non-custodial parent.
- She makes a spontaneous comment about an older sibling at the visited home, and this is interpreted to be sexual in nature. She is referred to the advocacy center.
- There is not a clear disclosure of sexual abuse.
- The examination reveals a crescent hymen and no redness or discharge.
- A urine NAAT is obtained.

Results

- The urine NAAT was positive.
- The sample was sent for confirmatory testing; result was negative.
- The child's sibling (who was also in the home) was also tested (urine NAAT), and the result was negative.

Treatment

- The child is treated with Azithromycin.
- Parents are advised that this is most likely a false positive result.

Nucleic Acid Amplification Tests

- Nucleic Acid Amplification Tests (NAATs) are highly sensitive and specific for *N. gonorrheae* and *C. trachomatis*.
- NAATs performed on urine may be used for detecting infection in prepubertal and postpubertal girls.
- A positive NAAT should be treated presumptively and the result warrants confirmatory testing, especially in areas with low prevalence of disease.
- NAATs are not yet approved in children for testing of these diseases in the throat or anus.
- These tests are sensitive and may result in a positive finding due to perpetrator secretions on the child's body, and not necessarily infection.

Hammerschlag MR, Gaydos CA. Guidelines for the use of molecular biological methods to detect sexually transmitted pathogens in cases of suspected sexual abuse. *Methods Mol Biol*. 2012 ;903: 307-17.

Which Tests for STI's Are Recommended for a Pre-pubertal Sexually Abused Child?

What about Trichomas?
Testing when it seems unlikely?

Ann Lenane, MD

Case

- Ten year-old girl
- Brought to Emergency Dept. by her mother.
- Wrote her a letter saying her father was touching her in bad ways.
- No details in the letter.

Emergency Evaluation

- Healthy appearing
- Tall for age
- Tanner stage III
- Vaginal discharge seen in ER

Lab Results (From ED)

- Urine NAAT for GC and Chlamydia
- Vaginitis "triple screen" (Candida, Gardnerella vaginalis and Trichomonas)
- Positive test for Trichomonas

Further Action

- Child Protective Services report
- Law enforcement investigation
- Disclosure of penile-vaginal and penile-anal contact

Child Abuse Evaluation

(Done 36 hours later, before any treatment)

- Fairly normal exam (minimal D/C only)
- Repeat urine NAAT (negative)
- Repeat vaginitis triple screen (positive)
- Trichomonas culture (positive)
- Wet Prep (positive)
- Treatment

Follow Up

- Follow up testing all negative.
- Case went to trial a year later.
- Father convicted of sexual misconduct.

What did we learn?

- Important to test for Trichomonas
- Important to get confirmation (for any STI) before treatment

Trichomonas vaginalis

- "Probably" the most prevalent non-viral STI among adults in the US.
- Rare perinatal transmission.
- Strongly associated with sexual activity.
- Contamination with fecal material could cause a false positive wet mount (intestinal flagellate similar to *T. vaginalis* = *T. hominis*).
- The Affirm VP III microbial identification system (Becton Dickinson) test is a direct nucleic acid probe hybridization test for the detection of *T. vaginalis*, *Gardnerella vaginalis*, and *Candida* spp.

(Hammerschlag, 2010)

NAATs for *T. vaginalis*

- TMA based APTIMA *T. vaginalis* assay
- NAATs are most sensitive and specific

Hobbs MM, Sena AC. Modern diagnosis of Trichomonas vaginalis infection. *Sex Transm Infect.* 2013 September ; 89(6): 434–438.

Case

- CPS investigating a developmentally delayed 3 year old.
- Allegation is abuse by day care provider during diaper change.
- Day care center, all female staff; changing area is open; two staff members are always present.

Disclosure

- Child had a rash, cried with diaper change upon return from day care.
- When her mother asked if the day care provider hurt her, child said yes.
- Child had diarrhea that day at day care, documented in day care notes.
- CPS offered mother a medical evaluation by a child abuse provider.
- Mother wanted this done.

Child Abuse Medical Evaluation

- No history of any other abuse concerns
- Child spends time with mother (she has a boyfriend), father, maternal grandmother and day care
- Copious yellow, thick genital discharge
- Urine NAAT positive for GC

Confirmatory Testing

- Culture for GC positive.
- Urine NAAT using a different kit also positive.
- Our program has a laboratory that automatically sends the urine for a second (different) NAAT if the initial NAAT is positive.

Treatment

- Ceftriaxone (IM)
- Recommendations are to add azithromycin
- Follow up testing

Follow Up

- All caretakers agreed to STI testing EXCEPT mother's boyfriend.
- He disappeared.
- All those tested were negative.
- Follow up testing, culture and NAAT negative.

What did we learn?

- Sometimes low suspicion cases turn out to be positive.
- Always offer a medical evaluation.
- Do not refuse to do a medical evaluation even when the allegations are "low level."

N. gonorrhoeae

- Most will have signs of clinical vaginitis.
- Asymptomatic infections do occur.
- Perinatal infection unlikely beyond 1 month of age.
- Gram negative coccobacilli.

Non-Sexual Transmission of *N. gonnorhoeae*

Recommended Reading:

Goodyear-Smith F. What is the evidence for non-sexual transmission of gonorrhoeae in children after the neonatal period? A systematic review. *Journal of Forensic and Legal Medicine*. 2007; 14(8):489–502.

What to Do with Positive Test Results

- Interpretation of the result
- Retesting and confirmatory testing as needed
- Determination of potential other methods of transmission
- False positives—legal implications
- Treat the patient

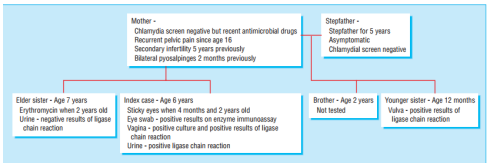
Findings Caused by Trauma or Sexual Contact

Infections transmitted by sexual contact, unless there is evidence of perinatal transmission or clearly, reasonably and independently documented but rare non-sexual transmission

42. Genital, rectal or pharyngeal Neisseria gonorrhea infection
43. Syphilis
44. Genital or rectal Chlamydia trachomatis infection
45. Trichomonas vaginalis infection

Adams JA, et al. Updated guidelines for the medical assessment and care of children who may have been sexually abused.

A Family Cluster of Chlamydia trachomatis Infection



Thompson C, Macdonald M, Sutherland S. A family cluster of Chlamydia trachomatis infection. *BMJ*. 2001; 322: 1473.

Cornea:
September 1995
ORIGINAL ARTICLE: PDF Only

Chlamydia trachomatis Can Be Transmitted by a Nonporous Plastic Surface In Vitro.

Novak, Kenneth D. M.D.; Kowalski, Regis P. M.S.; Karenchak, Lisa M. B.S.; Gordon, Y. J. M.D.

Abstract

Chlamydial conjunctivitis is a disease associated with venereal transmission through direct sexual contact or autoinoculation with genital secretions. Appropriate therapy for patients and their sexual partners involves important questions regarding the source of infection and mode of transmission. This study explored the potential role of a fomite, i.e., an environmental surface, as a possible vector of transmission. We determined the in vitro recovery of Chlamydia trachomatis from a nonporous plastic surface under ambient and humid conditions using the standard shell vial technique and confirmation by direct monoclonal immunofluorescence. Under ambient conditions, the TP50 (time at which 50% of samples were positive for Chlamydia) was 5 min, with complete desiccation occurring at 45 min. Under humid conditions, the TP50 was 52.5 min and complete desiccation did not occur up to 3 h. Beyond 45 min, a significantly greater number of positive chlamydial samples were collected under humid conditions (11 of 30) than under ambient conditions (0 of 30) ($p = 0.00016$). We conclude that a fomite, such as a nonporous plastic surface, may serve as a potential vector for the transmission of chlamydial infection to the eye, especially under humid conditions. This new information may prove useful in counseling patients and their sexual partners.

TABLE 2. Recommended tests for STIs in children

Infection	Reportable as sexual abuse	Site(s) and specimen(s)	Recommended test(s)
N. gonorrhoeae	Diagnostic	Vagina, urethra (males), rectum, pharynx	Culture on selective media, isolates confirmed by at least 2 methods that use different principles; NAATs[b] may be used, but some NAATs may cross-react with other *Neisseria* species; specimens should be retained for additional testing; NAATs are not approved for rectal or pharyngeal specimens
C. trachomatis	Diagnostic[a]	Vagina, urethra (males), rectum, urine (if NAAT is used)	Culture (tissue culture, confirmation by staining with FA-conjugated species-specific monoclonal antibody with visualization of characteristic intracytoplasmic inclusions); NAATs[b] may be used if culture is not available; specimens should be retained for further testing; NAATs are not approved for rectal specimens
Syphilis	Diagnostic[a]	Serum, active lesions	Serology (initial screening with nontreponemal test, confirmation with treponemal test); dark-field microscopy to identify treponemes in lesions
HSV	Suspicious	Lesions on vagina, urethra (males), rectum	Culture; screening using serology is not recommended
T. vaginalis	Highly suspicious	Vagina	Examination of vaginal wet mount; culture
HPV	Suspicious	Vagina, urethra (males), rectum	Physical examination; biopsy and HPV typing of lesions
HIV	Diagnostic[a]	Serum	EIA, followed by Western blot, viral load

[a] If perinatal acquisition can be ruled out.
[b] Data on the use of NAATs in children are limited to SDA and TMA with vagina and urine from females.

Hammerschlag MR, Guillén CD. Medical and legal implications of testing for sexually transmitted infections in children. *Clin Microbiol Rev*. 2010; 23(3): 493-506.

Follow-up Examinations

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http://www.cdc.gov/std/treatment/2010/sexual-assault.htm

Study of the Follow-up Exam

- The results of this study strongly support follow-up sexual abuse examinations for
  - Adolescent and sexually active females
  - Uncooperative patients
  - Females who disclose genital-genital contact with the perpetrator
  - Cases of DFSA
  - Patients with initial unknown or positive non-acute findings

STIs on Examination #2

STIs were detected in a significant proportion of patients during both examination 1 and examination 2.

Gavril AR, Kellogg ND, Nair P. Value of follow-up examinations of children and adolescents evaluated for sexual abuse and assault. *Pediatrics*. 2012; 129(2): 282-9.

MMWR Update to CDC's STD's Treatment Guidelines 2010 (Aug 2012)

Clinicians who diagnose gonorrhea in a patient with persistent infection after treatment (treatment failure) with the recommended combination therapy regimen should culture relevant clinical specimens and perform antimicrobial susceptibility testing of *N. gonorrhoeae* isolates.

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6131a3.htm

Summary

- Recommendations for STI testing in children when sexual abuse is suspected
- Interpretation of a positive STI test result
  - GC
  - Chlamydia
  - T. vaginalis