Do Pregnant Women with Positive Treponemal and Persistently Negative Nontreponemal Tests Transmit Syphilis to their Babies? An Analysis of Congenital Syphilis (CS) Surveillance Data

Daniel R. Newman, MA; Thomas A. Peterman, MD, MSc; Hillard S. Weinstock, MD, MPH; John R. Su, MD, PhD, MPH; Darlene Davis
Division of STD Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Background

- Screening pregnant women starting with treponemal tests identifies some with positive treponemal tests and negative nontreponemal tests who would not be identified if screening started with a nontreponemal test.
- The risk of syphilis transmission to an infant from these women is thought to be low.

Objectives

- Determine if there is a risk of CS in infants born to mothers with a positive treponemal test and persistently negative nontreponemal tests.

Methods

- Before 1988, CS definition focused on children likely to be infected (Kaufman criteria).
- Since then, the definition changed to include all children born to mothers with untreated syphilis.
- We reviewed line-listed cases of CS reported to CDC (birthdates 1991-2009) to see if any:
  1) Were born to mothers with persistently negative nontreponemal tests
  2) Had definite or probable CS according to the Kaufman criteria

Clinical Characteristics of Children with Probable Congenital Syphilis, by Mother's Nontreponemal Test Results

	Child's Clinical Findings Reported									
	Any finding		Clinical signs		Long bone x ray		CSF protein or cell count		CSF VDRL	
Mother's test results reported	yes	reported	yes	reported	pos	reported	high	reported	pos	reported
-nontreponemal n (N=86)	15	86	2	84	2	16	12	19	1	25
% (yes/reported, reported/N)	17.4	100	2.4	97.7	12.5	18.6	63.2	22.1	4.0	29.1
+nontreponemal* n (N=22,202)	7,629	22,202	1,222	20,935	934	9,934	5,999	9,024	1,523	13,638
% (yes/reported, reported/N)	34.4	100	5.8	94.3	9.4	44.7	66.5	40.6	11.2	61.4

* Includes 634 with other/unknown test results

Significantly less likely to have **any** signs of CS

Slightly less likely to have any clinical signs

Similarly likely to have reported x-ray findings

As likely to have elevated cerebrospinal fluid protein or cell count

Less likely to have a positive CSF VDRL

Testing History for Mothers N=86

- 24 mothers with negative nontreponemal tests both before and after delivery:
  - 21 had 1 negative test reported after delivery
  - 3 had 2 negative tests reported after delivery
- 62 mothers with no tests reported before birth and only negative tests after birth:
  - 60 had only one test reported
  - 1 had 2 negative tests reported
  - 1 had 3 negative tests reported
- For the 86 mothers the dates of last test ranged from 1 to 128 days after birth
- A positive treponemal test result was reported for 76
  - 1 had a negative test result
  - 9 had 'no test' reported

Test Results for Infants N=86

- 79 had at least one positive syphilis test reported:
  - 6 had only negative test results
  - 1 had unknown results
- Test type (treponemal or nontreponemal) has only been collected since 2004, and was available for 13 infants:
  - 2 were positive for both tests with 1:1 nontreponemal titers
  - 10 had positive treponemal tests and negative nontreponemal tests (like their mothers)
  - 1 was negative for the treponemal and nontreponemal test

Most Convincing Cases

not so convincing

- One child from a mother with good evidence for a persistently negative nontrepone One child from a mother with good evidence for a persistently negative nontreponemal test may have met the Kaufman criteria for a probable case. The mother had a positive treponemal test on the day of delivery, but negative non-treponemal the day before birth, the day of birth and 26 days after birth. The infant had x-rays reported as suggestive of CS and an elevated CSF cell count or protein. The original case report form could not be located to assess for coding errors or nature of x-ray findings.
- Another child met the Kaufman criteria for a probable case, with clinical signs, x-ray findings, and a positive serologic test 5 months after birth. But the mother had only one tested reported--the day after delivery- -so could have been recently infected
- The 11 others had elevated CSF cell count or protein which is nonspecific

Older Children N=59

- 59 children were diagnosed with CS after they were 1 year old:
  - 13 of them had been born outside the United States
  - 6 had 'unknown' state of birth (which usually indicates an adoption)
- Of the 40 remaining children:
  - 13 had a mother with both positive treponemal and nontreponemal tests recorded
    - 1 tested positive before birth
    - 12 tested positive after birth (ranging from 143 to 3655 days after birth)
- There were 28 cases of CS diagnosed in children >1 year of age who were US born to mothers with unknown nontreponemal results (or possibly 34 including adoptions)
- None of the children with CS diagnosed after 1 year of age were reported as having a mother with only negative nontreponemal results

Results

- From 1991-2009, 23,863 cases of congenital syphilis were reported to CDC
- The most convincing cases of CS were:
  - 1,271 (5.4%) stillbirths
  - 284 (1.2%) confirmed cases

  } None Had Only Negative Nontreponemal Tests
- Of the remaining 22,308 CS reports:
  - 24 were from mothers with negative nontrepomenal tests reported both before and after birth
  - 62 were from mothers with no test reports prior to birth and only negative tests reported after birth

Conclusions

- After reviewing over 23,000 congenital syphilis cases over the past 19 years, there were no stillbirths or confirmed cases reported from women with only negative nontrepomenal tests.
- Among the 22,290 'probable' cases of congenital syphilis:
  - One had intriguing results that could not be verified as the case report was unobtainable
  - Another had only a single negative nontreponemal report one day after delivery so recent infection was likely
- The risk of transmission of syphilis from these mothers to their infants appears unlikely.
- If any cases are found they should be reported.

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of STD Prevention

E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

CS230666A