Prevention of Congenital Syphilis in the Context of Rising Syphilis Diagnoses

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Healthy Mothers and Healthy Babies
March 12, 2016
Objectives

• Understand epidemiology of syphilis in BC
  • Particularly maternal and congenital syphilis

• Describe syphilis screening/testing process in BC
  • Primer on how to interpret RPR titres

• Review maternal and congenital syphilis

• Describe the prenatal STI screening recommendations
  • Rationale for 3rd trimester screening
Epidemiology of Syphilis in BC
Infectious Syphilis Cases in BC
Syphilis Rates by Region

![Graph showing syphilis rates by region from 2006 to 2015. The rates are indicated by different colored lines, each representing a specific region or group. The y-axis represents the incidence rate per 100,000 population, while the x-axis represents the years from 2006 to 2015. The rates show a general increase over the years, with some fluctuations.](image-url)
Syphilis Rates by Age
Stage of Infection

- Early Latent
- Secondary
- Primary
Proportion of Syphilis Cases by Exposure
Syphilis among Women
Syphilis Cases in Women, by Age
## Maternal and Congenital Syphilis

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Maternal syphilis</td>
<td>16</td>
<td>14</td>
<td>8</td>
<td>14</td>
<td>13</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Early congenital syphilis</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Live births</td>
<td>40,642</td>
<td>41,570</td>
<td>43,473</td>
<td>44,119</td>
<td>44,888</td>
<td>43,670</td>
<td>43,991</td>
<td>44,270</td>
<td>44,148</td>
<td>44,148</td>
<td>n/a</td>
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<tr>
<td>Prenatal syphilis tests</td>
<td>n/a</td>
<td>n/a</td>
<td>45,016</td>
<td>47,098</td>
<td>47,011</td>
<td>47,348</td>
<td>48,726</td>
<td>50,040</td>
<td>49,724</td>
<td>50,741</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Syphilis Outside BC
Syphilis Rates in Other Jurisdictions

**Syphilis Rates in USA**

![Graph showing Syphilis Rates in USA from 2000 to 2014. The graph includes data for All Stages, Primary and Secondary, and Early Latent stages.](image)

*Figure 1. Reported number of cases and incidence of infectious syphilis: Ontario, 2000-2014*

- Male cases
- Female cases
- Male rate
- Female rate
- Overall rate

**PHO 4(9): Sept 2015**

**CDC 2014 STD Surveillance**
# Congenital Syphilis in Alberta

**Table 1:** Characteristics of 9 mothers in Alberta who each delivered a baby (in 2005 or 2006) with early congenital syphilis

<table>
<thead>
<tr>
<th>Residence</th>
<th>No.</th>
<th>Marital status*</th>
<th>Age group</th>
<th>Sex trade worker</th>
<th>Syphilis test before delivery</th>
<th>Stage of maternal syphilis</th>
<th>Treated during pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edmonton</td>
<td>8</td>
<td>5 partnered</td>
<td>15-40</td>
<td>5 of 8</td>
<td>4 yes</td>
<td>5 primary</td>
<td>7 no</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 unpartnered</td>
<td></td>
<td></td>
<td>4 no</td>
<td>3 secondary</td>
<td></td>
</tr>
<tr>
<td>Nonurban</td>
<td>1</td>
<td>Partnered</td>
<td>30-35</td>
<td>No</td>
<td>Yes</td>
<td>Primary</td>
<td>No</td>
</tr>
</tbody>
</table>

*Partnered = married or cohabiting (common-law), unpartnered = single or separated.

†Mother tested positive for syphilis 2 months before delivery but could not be located for treatment until the day of delivery.

Congenital Syphilis in USA

Bowen et al, MMWR 64(44): 1241-5, 2015
Similarities to BC?
Syphilis Screening and Testing
Syphilis Tests

• Treponemal tests (e.g. EIA, TPPA)
  • Highly specific for *T. pallidum* but remain for life
  • Positive tests need a non-treponemal test to confirm active syphilis

• Non-treponemal tests (e.g. RPR, VDRL)
  • Highly sensitive, but not specific to *T. pallidum*
  • False-positive with IVDU, malaria, TB, some autoimmune disorders

• Direct methods
  • Darkfield microscopy
  • Direct fluorescent antibody (DFA)
  • Molecular testing
Current Algorithm for Syphilis Screening

EIA* → RPR

+ +

RPR

- -

No syphilis dx*

+ +

Syphilis dx (old or new)

- -

Probably previous syphilis dx

* Repeat if clinically suspicious of early infection

Evaluate clinical history

TPPA (if suspect FP)
RPR 101

• The natural history of RPR is that it will decrease even without treatment; it may even become non-reactive.

• Generally, an increase in RPR titre of ≥ 2 dilutions (or 4-fold) indicates a new infection.
  • E.g. 1:8 → 1:32

• “Appropriate treatment response” = a 4-fold (or 2 dilution) drop in RPR titre following treatment (within 6-12 months)

• BUT, ...
  • Eventually (within ~2 years of treatment), RPR should be < 1:8.
Some illustrative examples

- **CASE 1**: 58F with previously treated syphilis 30 years ago.
  - EIA: Reactive
  - RPR: Non-reactive
  - TPPA: Reactive

- **CASE 2**: 58F with previously treated syphilis 30 years ago.
  - EIA: Reactive
  - RPR: 1:32
  - TPPA: Reactive
Reporting of Syphilis Cases to Public Health

- All reactive EIA and RPR reported to STI Physicians at BCCDC
  - High titres are called to STI physician immediately
- STI physician assesses, stages, and provides treatment recommendation
  - Based on RPR history, discussion with treating provider, etc.
- Syphilis nurses work with testing providers and/or patient to
  - Develop treatment plan
  - Discuss partner follow-up and care
Maternal and Congenital Syphilis
Maternal Syphilis

- Woman diagnosed with syphilis (primary, secondary, early latent, or late latent), in pregnancy, *regardless* of how it was diagnosed:
  - Prenatal serology screening, *or*
  - Known to have given birth to an infant (live or stillborn) with congenital syphilis, *or*
  - Clinical presentation with infectious syphilis during pregnancy
Treatment Considerations

• Infected mom may transmit syphilis *in utero* to fetus
  • May also transmit via direct contact during delivery

• **Timely treatment of maternal syphilis will prevent congenital syphilis**

• Please consult Provincial STI/HIV Clinic Physician (604-707-5606)

• BCCDC STI Treatment Guidelines
  • Benzathine penicillin G 2.4M units in a single dose
    • Additional doses may be needed
  • Doxycycline is contraindicated in pregnancy
Congenital Syphilis

• CDC Case definition (generally, one of two criteria suffices):
  1. Physical, laboratory or radiographic signs of congenital syphilis
  2. Baby born to mom with untreated or inadequately treated syphilis

• Clinical manifestations:
  • Hepatosplenomegaly, rash, snuffles, condyloma lata, jaundice, edema, pseudoparalysis.
  • Older kids (>2 years): saber shins, Hutchinson incisors, mulberry molars, saddle nose, interstitial keratitis, rhagades.

Congenital syphilis cases should be reported to local health unit
Snuffles
Rhagades
Saber shins
Interstitial keratitis
Perforated hard palate
Mulberry molars
Hutchinson incisors
Rash on soles
Clutton joints
Prenatal STI Screening
STI Screening during Pregnancy

• Canadian Guidelines on Sexually Transmitted Infections
  • Syphilis, chlamydia, and syphilis screening recommended at **first prenatal visit**
    • Women with ongoing risk factors for STI acquisition should be considered for **rescreening each trimester**
  • Syphilis screening recommended at **28-32 weeks** and **at delivery** for women at high risk of acquiring syphilis (or areas experiencing heterosexual outbreaks of syphilis)
  • Syphilis testing recommended for women who has a **fetal death > 20 weeks gestation**

• No newborn should be discharged from hospital prior to documented confirmation that mother or infant has had syphilis serology
Questions?