Elimination of mother to child HIV transmission: is it possible?

Judy Levison, MD, MPH
Associate Professor, Department of Obstetrics and Gynecology
Baylor College of Medicine
Houston, Texas
Objectives

• State the risk of perinatal HIV transmission without antiretroviral therapy and with therapy
• Explain 3 methods of lowering HIV transmission between sexual partners
• Outline at least 4 barriers to prevention of perinatal HIV transmission
• State the name of the 24/7 service available for clinicians with questions about HIV in pregnancy
Treatment prevents vertical transmission

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>25%</td>
</tr>
<tr>
<td>Zidovudine (AZT) antepartum, intrapartum, and postnatal</td>
<td>8%</td>
</tr>
</tbody>
</table>

Connor et al. NEJM 1994;331:1173-1180
More effective therapies

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Failure Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective Cesarean with AZT given antepartum, preop and postnatally</td>
<td>2%</td>
</tr>
<tr>
<td>Combination antiretroviral therapy antepartum — and — AZT (intrapartum) and postnatally</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Mandelbrot L et al.. JAMA 1998;280:55-60
The European Mode of Delivery Collaboration. Lancet 1999;353:1035-1039
www.aidsinfor.nih.gov
Perinatal Transmission Rate by Maternal HIV-1 RNA - WITS

Garcia et al NEJM 1999;341:394-402
Epidemic in the United States Among Women and Children

- The number of HIV-infected infants born each year has decreased from ~1750 (in the mid-1990s) to ~143 in 2010

http://www.cdc.gov/primarycare/materials/hivtransmission/
Rates (per 100,000 Live Births) of Diagnosed Perinatally Acquired HIV Infections, by Year of Birth and Race/Ethnicity, 2007–2009—46 States

http://www.cdc.gov/hiv/risk/gender/pregnantwomen/facts/
Missed opportunities

- Where are they?
Missed opportunities

• Most new infections are attributable to failures to perform well established interventions (i.e., “missed opportunities”)

• Every perinatal HIV infection represents a sentinel public health event

Nesheim S et al. Pediatrics 2012;130: 738-744
Case 1

- 21 y.o. G1 diagnosed with HIV early in pregnancy. Met the man of her dreams two years ago and was married one year ago. Has had only one sex partner, her husband. No “risk factors.”
How might her HIV infection have been prevented?

1. Test all adults at least once at routine health care visits (men and women)
2. If he had tested positive, give him combination antiretroviral medication (cART)
3. If the couple had known prior to attempting pregnancy, offer her pre-exposure prophylaxis (PrEP)
4. All of the above
Prevention of HIV infection and early diagnosis of those with HIV

• Testing of all adults with HIV
  – African-American infants accounted for 69% of diagnoses of perinatal HIV infection in 2004–2007, although only 15% of infants are African-American.

• 16% of those with HIV in the U.S. do not know they have HIV

• Most individuals who know their HIV status make changes in their lifestyles

• Early treatment of HIV with cART reduces HIV transmission by 96%

• PrEP for HIV-uninfected individuals at risk for HIV infection can reduce transmission by 92% (if the medication is taken)

Nesheim S et al. Pediatrics 2012;130:738-744
Cohen M et al. NEJM 2011;365(6):493-505
Grant R et al. NEJM 2010; 363(27):2587-2599
Preconception care and family planning for the woman with HIV:

<table>
<thead>
<tr>
<th>Location</th>
<th>Sample Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>US general population</td>
<td></td>
<td>49% pregnancies unintended</td>
</tr>
<tr>
<td>US, WIHS</td>
<td>232 HIV+ women</td>
<td>77% pregnancies while using contraception (vs. 60% HIV-)</td>
</tr>
<tr>
<td>US</td>
<td>1090 HIV+ adolescents</td>
<td>83.3% unplanned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>49-52% HIV status known</td>
</tr>
<tr>
<td>Italy</td>
<td>334 HIV+ on ARV</td>
<td>57.6% unplanned</td>
</tr>
</tbody>
</table>

Finer L and Henshaw S. Perspec Sex Repro Health 2006; 38(2):90–96
Massad L et al. AIDS 2004; 18(2):281-286
Koenig L et al. AJOG 2007; 197(3):S123-S131
Floridia M et al. Antivir Ther 2006; 11(7):941-946
Universal prenatal screening

- “Opt out” screening recommended by CDC since 2006
- Screening at first prenatal visit and in third trimester
- Rapid testing in Labor and Delivery if no third trimester test has been done or if results not available

Branson et al. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm
50 states/50 sets of laws on testing

- Quick reference to your state’s laws about HIV testing in pregnancy: http://nccc.ucsf.edu/clinical-resources/hiv-aids-resources/state-hiv-testing-laws/
Case 2

- 35 y.o. G2 P1 at 38 weeks gestation presents for first prenatal visit after recent arrival from another country.
- Third trimester screening with the new algorithm for testing was done.
Lab results on our patient

1) HIV-1/2 Antigen/Antibody: Positive

2) HIV-1/HIV-2 differentiation assay:
   HIV-1 Antibodies Negative/
   HIV-2 Antibodies Negative
Does this woman have HIV?

1. No, because the second test was negative
2. She needs to have a Western blot done to find out
3. She needs to have a viral load done to see if she has HIV
Case 2 continued

- The clinician was not sure how to interpret the results.
- Since he had heard that the new tests are much better than the old screening test and the Western blot, he figured that the second test was a negative confirmatory test.
- The patient arrived in Labor and Delivery in early labor 3 days later, no viral load was available, and she underwent Cesarean to prevent transmission of possible HIV.
- Final viral load (came back after delivery): <20 copies/ml (undetectable)
About testing

• We need to do the test. It depends on which state you live in as to whether
  – the test is required in pregnancy
  – opt in or opt out testing is used
  – written consent is needed

• We need to do a better job at educating clinicians about HIV testing and what results mean

• We need to report the test results more clearly.
Provision of adequate prenatal care for women who have HIV infection

• Linkage to care
• Linkage to care
• Linkage to care
Case 3

• 28 y.o. G3P2 at 34 weeks arrives in U.S. from another country, obtains appropriate insurance coverage, scans the internet, and calls an office that advertises high risk obstetric care.

• She goes to the office, and a nurse takes her history. The woman states upfront that she has HIV and is on medication.

• She is told the doctor will not see her because he does not take care of women with HIV.
Case 3 continued

• The same scenario is repeated at a second doctor’s office.
• She calls 15 other offices and cannot find someone to care for her.
• She presents in labor at term “with no prenatal care.”
What might one of those offices have done?

CHOOSE ALL THAT APPLY:

1. Called the Perinatal HIV Hotline 1-888-448-8765
2. Called the nearest medical school Department of Obstetrics and Gynecology or Department of Internal Medicine/Division of Infectious Disease
3. Called the Department of State Health Services
4. Called the phone number of the referral site and made an appointment for her
Maximal reduction of maternal viral load through appropriate use of ARV drugs

- Referral to Perinatal HIV specialist or Maternal Fetal Medicine specialist or Infectious Disease Specialist
- cART
- Viral loads every 2-4 weeks until undetectable, then q 4 weeks
- Identify specific barriers to HIV adherence (Does taking pills act to remind her of her HIV status and she would prefer to be in denial? Does she have difficulty swallowing pills? Do those in her household not know of her HIV status? Does she forget to take pills?)
Cesarean delivery when maternal viral load is not maximally suppressed

• If viral load >1000, then scheduled Cesarean at 38 weeks recommended

• What if you do not know the viral load?

Case 4

- 25 y.o. G1P0 presents at hospital labor triage at 38 weeks by her report. Had prenatal care in another country. Prenatal labs including HIV test done.
- 3 days later the HIV screening and confirmatory tests both return positive.
- The patient is called in to discuss results.
What should the clinician do?

CHOOSE ALL THAT APPLY:

• Draw a viral load to see if greater than 1000 (at this hospital it takes about 3 days to get results).
• Start her on cART.
• Tell her to go to the high risk hospital when she goes into labor.
• Admit her for an immediate Cesarean with 3 hours of preoperative IV zidovudine.
• Notify the pediatricians of a high risk baby.
What should the clinician do?

**CHOOSE ALL THAT APPLY:**

1. Draw a viral load to see if greater than 1000 (at this hospital it takes about 3 days to get results).
2. Start her on cART.
3. Tell her to go to the high risk hospital when she goes into labor.
4. Admit her for an immediate Cesarean with 3 hours of preoperative IV zidovudine.
5. Notify the pediatricians of a high risk baby.
Provision of neonatal ARV prophylaxis

• Notify the pediatricians of the impending birth of an HIV-exposed baby
• Make sure pediatricians are aware of options for infant prophylaxis
  – Standard zidovudine twice daily for 4-6 weeks
  – If a high risk baby, then zidovudine twice daily for 6 weeks PLUS 3 doses of nevirapine at 0, 48 hours later, and 96 hours after second dose, or
  – P1115 experimental protocol: draw DNA or RNA HIV PCR at birth and begin therapeutic doses of cART

Neonatal replacement feeding as well as maternal support for lactation suppression

- In the United States breastfeeding is not recommended (very different from low resource areas where formula is not affordable, feasible, accessible, sustainable, and safe)
- If a woman still opts to breastfeed, consult with pediatrician to keep baby (and mother) on antiretrovirals until baby fully weaned and do monthly VLs on mother
Linkage to care after delivery

• This is where every person in this room may have a role—whether you are a social worker, pharmacist, case linkage worker, epidemiologist, physician, NP, PA, nurse, or concerned community member
Cascade of Events for the Successful Prevention of MCT of HIV

- Prevention of HIV infection in women and girls of childbearing potential
- Identification of infection among women of childbearing potential
- Assurance of adequate preconception care and family planning services for HIV-infected women
- Early identification of HIV infection of pregnant women through universal prenatal screening
- Provision of adequate prenatal care for women who have HIV infection
- Maximal reduction of maternal viral load through appropriate use of ARV drugs
- Cesarean delivery when maternal viral load is not maximally suppressed
- Provision of neonatal ARV prophylaxis
- Neonatal replacement feeding as well as maternal support for lactation suppression

Nesheim S et al. Pediatrics 2012;130: 738-744
Fetal and Infant Mortality Review (FIMR)/HIV model

• Identification of HIV-infected infants as well as “near misses”

• Maternal interview and abstraction of data from medical chart

• Community Review Team (CRT) analyzes summaries of each case and identifies system-based gaps

• Community Action Team (CAT) takes recommendations of CRT and makes institutional changes

http://www.fimrhiv.org/
Perinatal Hotline – National Perinatal HIV Consultation and Referral Service

- Around-the-clock advice on testing and care of HIV-infected pregnant women and their infants
- Provides referral to HIV specialists and regional resources
  - 1-888-448-8765
  - HIVtesting@nccc.ucsf.edu
- For additional resources: [http://www.nccc.ucsf.edu](http://www.nccc.ucsf.edu)
Resources for Clinicians

- Offering information on AIDS treatment, prevention, and research
- Clinical guidelines for ARV treatment
  - Perinatal/Mother-to-Child Transmission
  - Pediatrics
  - Adults and Adolescents
Thank you!

• I am happy to be available for questions
• jlevison@bcm.edu
ACTHIV 2015: A State-of-the-Science Conference for Frontline Health Professionals

Activity Code FM285