Infant Feeding Guidelines & HIV: the Complex Issues

Presented by:
Dr. Mona Loutfy on behalf of the IHPREG team
Disclosure

No conflicts of interest to declare
Objectives

1. To review Infant Feeding and nutrition in the context of HIV
2. To review the various Guidelines on Infant Feeding and HIV
3. To explore the multiple Complex Issues and Dilemmas related to Infant Feeding and HIV
What is Infant Feeding & Why is it important?

Infant Feeding is the provision of ideal food for the health, growth and development of infants:

The ideal food recommended for the first six months of life is **breast milk**, provided exclusively and supplemented by complementary foods beyond six months\(^1\)

- Breast milk satisfies the baby’s nutritional and hydration needs
- Enhances the baby’s immune system
  - Protects against pathogens
  - Protects against development of allergies
  - Contains factors that modulate the immune development of the baby
- Promotes psychological development through bonding

Contraindications to Breastfeeding

- HIV-infection
  - Transmitted through breast milk
- Galactosemia
  - A rare genetic disorder which causes milk intolerance
- Herpes lesions on both breasts
  - Transmitted through contact between breast and infants mouth
- Untreated, infectious tuberculosis
  - Transmitted through proximity of feeding i.e. exposure to sputum (coughing etc.)
- Hepatitis C if cracked nipples
  - Can be transmitted from cracked and bleeding nipples
- Some drugs and treatments
  - Antimetabolites, chemotherapeutic agents, and radioactive isotope therapies
- Any severe illness that prevents mothers from care giving

http://www.who.int/maternal_child_adolescent/documents/WHO_FCH_CAH_09.01/en/
Early studies on the rates of HIV transmission through breastfeeding

Pooled analysis of multi-site prospective cohorts studies (Lancet 1998)

- Less than 5% of 2807 children in four studies from industrialised countries (USA, Switzerland, France, and Europe) were breastfed. No HIV-1 transmissions were recorded.
- Late postnatal transmission occurred in 49 of 902 (5%) breastfeeding infants in four cohorts from Rwanda [Butare and Kigali], Ivory Coast, and Kenya.
- An estimated risk of 3.2 per 100 child-years of BF follow-up (95% CI 3.1–3.8) was found in the latter group.

Early studies on the rates of HIV transmission through breastfeeding

A prospective study of infant feeding practices among HIV-1-infected women who were part of a vitamin A intervention trial in Durban, South Africa (Lancet 1999)

- 549 HIV infected women were analyzed
- Never breastfed children at 3 months n=156: transmission rate of 18.8% (95% CI 12.6–24.9)
- Ever Breastfed children at 3 months n=393: transmission rate of 21.3% (95% CI 17.2–25.5) (p=0.5)
- Proportion of infants infected by 3 months and who were exclusively breastfed was significantly lower than those who were mixed fed 14.6% vs. 24.1%

Introduction
Since the discovery that HIV-1 can be transmitted through breastfeeding, several policy recommendations have been developed, which are expected to have a global impact on maternal and infant health. Whether prevention of HIV-1 infection through avoidance of breastfeeding will in practice outweigh the adverse effects of not breastfeeding has yet to be discovered. Breastfeeding by HIV-1-infected women in more-developed countries has virtually ceased, and in less-developed countries many thousands of seropositive women and women who believe they may be HIV-1 infected are expected to avoid breastfeeding. The cultural diffusion theory raises the possibility that a loss of confidence in breastfeeding will spread to all women.

Advocates of child care consider breastfeeding to be one of the principal gains to current maternal and child health, regained through long-standing campaigns to protect mother and infant wellbeing. The reason why breastfeeding is believed to be pre-eminent in human nutrition derives from its well-recognised nutritional, immunological, social, psychological, and nurturing benefits, which are especially important in the first 3 months.

Analyses of HIV-1 transmission via breastmilk are flawed because they have failed to account for the effects of different types of breastfeeding practices: exclusive or mixed breastfeeding (without or with water, other fluids, 1. Coutsoudis et al. Lancet. 1999; Aug 7;354(9177):471-6.
Early studies on the rates of HIV transmission through breastfeeding

A landmark randomized controlled trial on HIV and breastfeeding in Nairobi Kenya, (JAMA 2000)

- Recruitment of 495 HIV+ pregnant ARV naive women from 1992 to July 1998
- n=401 mother infant pairs analyzed; n=197 BF, n=204 FF; 24 month follow-up
- Cumulative probability of infection at 24 months was 36.7% in the BF arm and 20.5% in the FF arm (P = .001)
- 16.2% of transmissions attributable to breastfeeding
- Formula reduced the risk of transmission by 44%

Global Rates of HIV from Vertical Transmission

In 2013, an estimated 1.5 million pregnant women were living with HIV globally:¹

- 90% of these women are concentrated in sub-Saharan African countries
- 51% of the estimated 1.5 million infants born to mothers living with HIV received prophylactic drugs
- 240,000 infants were infected with HIV in this time period

• The risk of transmission is estimated to be 15–30% in non-breastfeeding populations with no ART intervention;
• Breastfeeding adds an additional 5–20%
• Likely about 100,000 infections related to breastfeeding

Maternal ART for PVT

Number of pregnant women living with HIV in low- and middle-income countries and the number and percentages of those women receiving ARV drugs for PMTCT of HIV, 2005-2013

- Total number of pregnant women living with HIV (all needing PMTCT ARVs)
- Number of pregnant women living with HIV receiving ARV medicines for PMTCT (Option A, B and B+)
- Ranges
- Percentage coverage

Single-dose nevirapine is included in the data for 2005 to 2009.

Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and validation process for the number of pregnant women living with HIV receiving ARV drugs for PMTCT, and UNAIDS 2013 estimates for the number of pregnant women living with HIV.
Global Infant Mortality Rates

Trends in infant mortality rate (per 1000 live births) Globally and by WHO region, 1990-2013

Causes of Infant Mortality 2013

- Pneumonia: 13%
- Neonatal sepsis: 7%
- Congenital anomalies: 4%
- Prematurity: 15%
- HIV/AIDS: 2%
- Injuries: 5%
- Malaria: 7%
- Measles: 2%
- Diarrhoea: 9%
- Other group 1 conditions: 10%
- Other 4%
- Prematurity (0-27 days): 15%
- Neonatal tetanus: 1%
- Intrapartum-related complications, including birth asphyxia: 11%
Putting it all together …

All HIV and Infant Feeding policy around the globe is informed by **three types** of science:

1. Basic Science on Risk of HIV transmission through breast milk
2. Infant morbidity and mortality epidemiological data
3. Clinical trial data on reduction of transmission via breast milk with cART

• In addition, there are regional items to consider in terms of:
  1. Mixed feeding vs. exclusive breast feeding
  2. Access to potable drinking water
  3. Access to formula
WHO Guidelines

Key objectives of the WHO (2010) Guidelines:

“Infant feeding practices recommended to mothers known to be HIV-infected should support the greatest likelihood of HIV-free survival of their children and not harm the health of mothers”

Based on 9 principles:

1. Balancing HIV prevention with protection from other causes of child mortality
2. Integrating HIV interventions into maternal and child health services
3. Setting national or sub-national recommendations for infant feeding in the context of HIV
4. When antiretroviral drugs are not (immediately) available, breastfeeding may still provide infants born to HIV-infected mothers with a greater chance of HIV-free survival
5. Informing mothers known to be HIV-infected about infant feeding alternatives
6. Providing services to specifically support mothers to appropriately feed their infants
7. Avoiding harm to infant feeding practices in the general population
8. Advising mothers who are HIV uninfected or whose HIV status is unknown
9. Investing in improvements in infant feeding practices in the context of HIV

Context Specific Recommendations

In settings where national authorities have decided to promote and support breastfeeding and ARV interventions:

• Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should:
  – exclusively breastfeed their infants for the first 6 months of life
  – introduce appropriate complementary foods thereafter
  – continue breastfeeding for the first 12 months of life
  – breastfeeding should then only stop once a nutritionally adequate and safe diet without breast milk can be provided

In settings where national authorities have decided not to promote or support breastfeeding and ARV interventions

• Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should avoid breastfeeding altogether

• Safe water and sanitation are assured at the household level and in the community;

• Caregiver can reliably provide sufficient infant formula milk to support normal growth and development of the infant;

• Can be prepared cleanly and frequently enough so that it is safe and carries a low risk of diarrhea and malnutrition;

• Caregiver can, in the first six months, exclusively give infant formula milk;

• Family is supportive of this practice;

• Caregiver can access health care that offers comprehensive child health services.
AFASS\(^1\) principles – WHO 2003

- **Acceptable**: Issues at micro (individual), meso (family and culture) and macro (‘breast is best’ society) levels for women = STIGMA, FEAR OF DISCLOSURE, GUILT, LYING....
- **Feasible**: time, knowledge, skill and support to manage formula feeding is person dependent
- **Affordable**: we manage this in Ontario with the provincially funded formula program
- **Sustainable**: as above
- **Safe**: complex issue in terms of personal safety of mother is status is exposed and also that we make assumptions in Ontario (high resource setting) that all mothers to clean water and formula storage

1. [http://motherchildnutrition.org/info/afass-principles.html](http://motherchildnutrition.org/info/afass-principles.html)
What this translates into…

**Resource Limited Settings**

**Option B+**

- ART independent of CD4 count
  - ART to all pregnant and breastfeeding women regardless of CD4 count or WHO clinical stage
  - ART continued for life.

- Exclusive breastfeeding for first 6 months with complementary food added thereafter; breastfeeding to continue indefinitely (i.e. no weaning time recommended)

**Highly Resourced Settings**

- ART independent of CD4 count
  - ART to all pregnant women regardless of CD4 count or WHO clinical stage
  - ART continued for life.

- Exclusive infant feeding replacement

- Ideally, the country has a national or regional replacement feeding program

(WHO) (2013, June) http://www.avert.org/world-health-organisation-who-pmtct-guidelines.htm#sthash.NVYyZWIm.dpuf
WHAT ARE THE DILEMMAS?
Outlining the main dilemmas for HIV and Infant feeding

Dilemma 1: Contradicting Guidelines

Dilemma 2: In the era of ART, how much of a risk is there?

Dilemma 3: Misunderstanding of the science

Dilemma 4: Psycho-social, stigma, fear issues

Dilemma 5: Legal implications
### Various Infant Feeding Guidelines

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Recommendation Related to Breastfeeding</th>
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<tr>
<td>WHO HIV and Infant Feeding&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Exclusive breastfeeding in <strong>low and middle resource</strong> settings as it may provide a greater chance of survival even when antiretrovirals are unavailable</td>
</tr>
<tr>
<td>United States (DHHS); Canada (Health Canada)&lt;sup&gt;2,3&lt;/sup&gt;</td>
<td>Breastfeeding is not recommended for HIV-infected women in the United States, including those receiving ART; ...</td>
</tr>
<tr>
<td>United Kingdom (BHIVA/CHIVA)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Recommend the complete avoidance of breastfeeding for infants born to HIV-infected mothers, regardless of maternal disease status, viral load or treatment but acknowledge rare instances when a mother will breastfeed</td>
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<sup>1</sup> http://www.who.int/maternal_child_adolescent/documents/9789241599535/en

<sup>2</sup> http://aidsinfo.nih.gov/contentfiles/lvguidelines/perinatalgl.pdf

Why are the guidelines confusing?

1. Target population is not monolithic
   - Women who have migrated from RLS to HRS likely experienced the success of more than one set of guidelines during pregnancy

2. Resource disparities within countries
   - Women living in LRS within HRS e.g. slums within megacities, rural and remote settings in western countries, indigenous communities in HRS may require greater accommodation
Case Study*

Calgary, Alberta

29-year-old married woman, immigrant from Ethiopia:

- reported consistent adherence to HAART
- HIV viral loads measured with the NucliSens HIV-1 QT assay (bioMérieux, USA) and the viral load remained undetectable
- Counseled to exclusively breastfeed and offered free formula
- Regularly attended high risk pregnancy clinic and received postpartum home visits
- Infant HIV testing at birth, 3 & 8 months (negative)
- Testing at 12 months (indeterminate)
- Testing at 13 months (positive)

*O’Bryan et al. CMAJ April 5, 2011 183:690-692;
Dilemma # 2

What is the Real Risks of Transmission in the Era of ART
Recent data on the rates of HIV transmission through breastfeeding.

Antiretroviral interventions for preventing breast milk transmission of HIV (Review)

White AB, Mirjahangir JF, Horvath H, Anglemyer A, Read JS
Transmission risk with antiretrovirals: Trials from the Developing World

- RCTs with breastfeeding mother-infant pairs, where either the HIV + mother or infant received antiretroviral prophylaxis for at least four weeks while breastfeeding were included.
- 7 RCTs were included in the review of reasonable methodological quality
- Complete avoidance of breastfeeding is the lowest risk option
- ARV prophylaxis during breastfeeding to either mother or infant decreases the risk of transmission
- ARV prophylaxis should be continued for duration of breastfeeding
  - NVP monotherapy for infants appears better than dual given risk of adverse events (later NVP resistance with sdNVP)
- Cannot determine whether maternal vs. infant prophylaxis is better
- Further research on maternal resistance
**Objective:** to determine the risk of perinatal transmission through breast milk among women on combination ART (cART)

- Included studies reported cART use among HIV-positive pregnant women prior to delivery with stated viral load responses, who then breastfeed for any length of time with reported perinatal HIV transmission rates to the infants.
- 10 studies met the eligibility criteria (three RCTs and seven observational studies) of which five were included in the meta-analysis, with a sample size of 2059.
- 2 of the included RCTs were also featured in the Cochrane systematic review
- Key differences: our study focused only on maternal combination ART & viral suppression, we also included observational studies, excluded short course ART and infant prophylaxis

- Five study sites in Burkina Faso, Kenya, and South African, 805 mother infant pairs were analyzed.
- Women were randomized into triple antiretroviral therapy n=401 or the zidovudine and single-dose nevirapine group n=404
- In infants whose mothers declared they intended to breastfeed, the cumulative rate of HIV transmission at 12 months was 5.6% (95% CI 3.4–8.9%) in the triple antiretroviral group compared with 10.7% (7.6–14.8%) in the zidovudine and single-dose nevirapine group (p=0.02)

- Pregnant women with HIV-1 infection in the Mma Bana Study in southern Botswana were randomized into 3 groups, 709 mother-infant pairs were included in the analysis of which 480 mother-infant pairs breastfed across the three groups
- 2 groups were randomized into either an NRTI based HAART treatment or PI based HAART treatment, the third group was followed observationally and was given nevirapine plus zidovudine–lamivudine
- Two transmissions occurred during breastfeeding, for a transmission rate of less than 1%
DILEMMA # 3

The Misunderstanding of the Science

Thanks to Dr. Lena Serghides
HIV reservoirs in milk – cell free HIV particles

- Detectable HIV RNA in the whey of 80% of untreated HIV infected women
  - but also sequestered in the lipid fraction and on surface of milk cells
- Women on Antiretroviral Therapy can have HIV RNA in their milk occasionally
- Often different viral load between the two breasts
- Affected by mammary gland inflammation
HIV reservoirs in milk-cell associated HIV

- **Latently infected resting memory CD4 T cells**
  - Not affected by ARVs
  - Inducible reservoir
  - 10x more efficient transcription and translation in milk vs. blood

- **Activated CD4 T cells**
  - Source of almost all HIV RNA
  - Can support HIV replication even in ARV-treated individuals
  - ARVs cannot significantly impact cell-associated RNA
  - HIV antigen producing T cells identified in milk samples from women with undetectable viral load

- **Cell-to-cell transfer of HIV**
  - Mammary epithelial cells
    - Susceptible to non-productive HIV infection
  - Macrophages
DILEMMA #4

Psycho-social Considerations
The HIV Mothering Study

• HIV Mothering Study’s 77 participants experienced a complex range of emotions as a result of not breastfeeding

• Emotions were affected by cultural, social and politicized messages about breastfeeding
  – “Breast is best”
  – Mixed messages if women were originally from a country where exclusive breastfeeding or other practice guidelines were recommended

Psychosocial Considerations

- Infant feeding is an emotionally laden issue for women with HIV that is often underpinned by HIV-related stigma.
- If not breastfeeding, women with HIV may feel:
  - A sense of loss, guilt, shame, worry, fear and grief
  - Social and cultural pressures and expectations
  - HIV-related and community stigma

“It makes me feel, um, like I’m not performing my full womanly duties as a mother.”

“In our culture it’s, it’s, you need to [breast]feed your baby if they don’t see it they say you are killing the baby.”

“I’m thinking if I don’t breastfeed, people will know”

Psychosocial Considerations

• HIV Mothering Study participants engaged in powerful and creative ways to counter messages around what it means to be a “good” mother and “breast is best”
  – Developing a “plan” to protect their privacy
  – Agency, leadership, moving forward

“I feel bad, like I don’t want to have to tell people excuses or it’s pretty much a lie, but I also don’t think everybody needs to know.”

“Of course it’s hard, it’s hard that you cannot do it for your child, but again, you want the best for them and the best for them is to be protected from HIV.”

“You know, I feel I can bond with my baby in another way.”

DILEMMA #4

Legal Implications
Why could infant feeding be a legal issue for women living with HIV?

- Criminal Law
  *Criminal Code of Canada*

- Child Protection
  *Child and Family Service Act*

Legal intervention is possible, but not a common occurrence.
In 2006, a woman in Ontario Canada, plead guilty to the charge of *failure to provide the necessities of life*. She received a 6 month sentence to serve conditionally in the community, followed by 3 years probation.

The circumstances:

- during pregnancy she did not take treatments to prevent transmission of HIV to her infant
- she did not inform the medical staff of her HIV+ status when she gave birth
- she breastfed the infant
- the infant was infected with HIV
What are we doing about this issue in Canada?
IHPREG & Ontario HIV Infant Feeding Working Group

Officially began in October 2012 with main activities:

- CIHR KS Grant submitted October 2012
- Scientific meeting February 2013 with support from OHTN
- Community forum September 2013
- Annual in person meeting June 2014
- Meeting with AIDS Bureau October 2014
- Special session at OHTN Back to Basic Conference Nov 2014
- National resource development with CATIE 2014/2015
What are we doing?

1. HIV & Infant Feeding Forum

Community forum
HIV & Infant Feeding in Ontario
A day to talk about the issues related to infant feeding

Saturday, September 21st, 2013
Specific location in Toronto to be announced

Participants Will:
- Exchange information about infant feeding guidelines in Ontario
- Learn more about the risk of transmission with breastfeeding
- Hear from experts about clinical issues, research, and the law
- Help guide future research in Ontario on this topic

THE COMMUNITY FORUM IS FREE BUT REQUIRES ADVANCED REGISTRATION

Registration begins on Monday, July 29th 2013 and ends Monday, September 16th 2013

Please register by email to
marvelous@whishh.com OR
logan.kennedy@wchospital.ca

Lunch will be provided. Space is limited.

For more information you can contact
Logan Kennedy at logan.kennedy@wchospital.ca
Or 416-351-3732 ext. 2784
What are we doing? (cont.)

2. Webinar with CATIE

Webinar series: HIV-positive parenting in Canada

Presented by CATIE and the Interdisciplinary HIV Pregnancy Research Group (IHtPREG), this three-part webinar series will explore issues related to HIV, pregnancy, and parenting in Canada. The series will feature presentations from people living with HIV, healthcare providers, and researchers.

Webinar #1 - Planning Pregnancies in 2014: Options and opportunities for care of people and couples affected by HIV

A live webinar with Dr. Mona Loutfy, Clinician Scientist at Women’s College Hospital and Associate Professor in the Department of Medicine at the University of Toronto.
Feeding Your Baby When You Have HIV

Do You Have ALL the Facts?

If you have HIV and are pregnant or have a young baby, you may want to know how to feed your baby safely. Reading this will help you get the facts you need to know.

Recommendations for feeding your baby

You may hear a lot of different advice about how to feed your baby if you have HIV. Part of the reason you might hear different things is because the recommendations in Canada are not the same as the recommendations in every other country. This is the advice recommended in Canada.
Breastfeeding and HIV-Infected Women in the United States: Harm Reduction Counseling Strategies

Judy Levison, Shannon Weber, and Deborah Cohen

Abstract
Social and cultural forces have led some HIV-infected women to question the recommendation to breastfeed. Without an open dialogue, breastfeeding can be provided in a manner exclusively or intermittently. We review the evidence from global breastfeeding among HIV-infected mothers and discuss a reduction model for women considering breast

Key words: breastfeeding, HIV, perinatal transmission, harm reduction

Issues in Applying a Harm Reduction Approach to Breastfeeding in the Context of Maternal HIV

Logan Kennedy, Mona Loutly, and Jason Brophy

Reply to Kennedy et al
Judy Levison, Shannon Weber, and Deborah Cohen

TO THE EDITOR—A harm reduction approach to breastfeeding in the context of maternal human immunodeficiency virus (HIV) was a refreshing perspective to consider and we congratulate Levinson on this provocative suggestion. Harm reduction as a counseling philosophy is consonant with the World Health Organization guidelines, as both focus on informed parental decision making. Choices regarding infant feeding are highly personalized for parents and we must not neglect these choices remain personal for women infected with HIV despite the limitations imposed by transmission risks and prevention guidelines. As members of a working group devoted to this topic, we joined in the referenced forum to discuss this approach to making an easy task and want to add to this discussion by raising the question of whether this framework is the opportunity to begin a dialogue with breastfeeding advocates and lactation consultants to understand how the data suggest that women living with HIV in resource-rich settings have concerns about breastfeeding, and her understanding of the risks to her child; what strategies may be useful to support her in keeping her baby free of HIV.

We agree that the desires of the mother may be in conflict with concerns for the child. Like other challenges faced by obstetric providers, balancing the interests of the mother and infant requires a collaborative approach to supporting a woman to remain in care and counseling her about what is known and not known about perinatal HIV transmission. In
# Summary & Conclusion

1. Variability in International and National HIV Infant Feeding Guidelines

2. People’s lives do not always ‘fit’ neatly into the guidelines: AFASS & does our counseling match this variability?

3. Discussions need to incorporate the needs of mothers and children to lead happy and healthy lives while taking into consideration complex factors including:

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<tr>
<th>Maternal</th>
<th>Infant/Child</th>
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<tr>
<td>• Right to informed choices about body, parenting</td>
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<td>• Personal and cultural pressures to breastfeed</td>
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<td>• Issues of disclosure and stigma</td>
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<tr>
<td>• Desire to provide ‘best’ for child</td>
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<tr>
<td>• Legal implications</td>
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<td>• Right to informed choice in terms of risk (?issue of harm reduction?)</td>
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<tr>
<td>• Bonding with mother</td>
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<td>• Cultural/familial acceptance issues</td>
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<td>• ‘Best” start in life</td>
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