Breastfeeding in the Context of HIV/AIDS: Facts vs Assumptions

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Outline of presentation

- Will present assumptions around breastfeeding and HIV transmission and for each assumption will consider what facts there are available to either justify, refute or qualify the assumption.
- We will consider what research questions still need to be answered to allow us to examine some of the assumptions more carefully.
Assumption:

Breastmilk of HIV infected women contains HIV virus and breastfeeding is therefore dangerous for infants of HIV infected women –

therefore no HIV infected women should breastfeed
Facts:

- Breastfeeding by HIV infected women does carry a risk for HIV transmission but the risk depends on many factors.
Facts:

- In 1992 based on results from studies with very unequal numbers of breastfed and formula fed babies and with ELISA measurements at 18-24 months, Dunn et al estimated the additional risk of MTCT of HIV was 14% (CI: 7-22%) – no qualification of when tx occurred.

- Recently 2 large studies (Kenya, South Africa) with over 100 breastfed and 100 formula fed infants and with frequent PCR testing confirmed finding but showed it was a cumulative risk over 24 months not a one off risk.

- It was also clear from these studies that the risk was associated with mixed breastfeeding.
Breastfeeding and HIV International Transmission Study – BHITS

- 3442 children uninfected at 4 weeks of age, of whom 231 became infected

- Estimated rate of BF transmission was 8.0 per 100 child-years of breastfeeding = 0.74%/mth of BF – ie 6 months of breastfeeding carries a risk of about 4-5%
Transmission and duration of BF – BHITS

- Risk was roughly constant over 24 months

- Transmission related to non-exclusive breastfeeding (mixed breastfeeding)
Note: results represent worst case scenario as these populations were mixed breastfed with no lactation mx to prevent breast problems
Facts:

- What is the risk if women practiced exclusive breastfeeding for at least 3 months?
Risk of HIV infection over time in 157 children never breastfed; 118 EBF; and 276 mixed breastfeeders

![Graph showing risk of HIV infection over time in 157 children never breastfed; 118 EBF; and 276 mixed breastfeeders.](Durban, South Africa)
Biological plausibility of benefit of ebf for reducing transmission risk

• Breast health
  ▪ GI factors
  ▪ Immune factors
Facts:

- Apart from mixed breastfeeding and prolonged durations of breastfeeding, what other factors make breastfeeding risky for HIV transmission?
Current understanding of risk factors

- Prolonged breastfeeding
- Mixed breastfeeding
- High plasma viral load, low CD4
Risk factors for postnatal transmission: Maternal immune status

HIV transmission from 6w-24mths in W.Africa by maternal baseline CD4 count

Cumulative HIV transmission %

- CD4<500
- CD4>500

Leroy et al. 2002
Current understanding of risk factors

- Prolonged breastfeeding
- Mixed breastfeeding
- High plasma viral load, low CD4
- Seroconversion during lactation
- Mastitis
- Cracked bleeding nipples, abscesses
- Sub-clinical mastitis (raised Na/K ratio)
- High viral load in breastmilk
- Oral thrush in infant
Facts:

- By reducing/eliminating these risk factors breastfeeding can be made safer
Making breastfeeding safer in terms of HIV transmission with the current knowledge we have

- Exclusive breastfeeding up to 6 mths
- Shorter duration – 6 months??
- Encourage condom use during lactation period
- Good lactation management (attachment, positioning) to avoid mastitis
Making breastfeeding safer in terms of HIV transmission

- No feeding from breast with cracked bleeding nipples or abscesses (express milk from affected side and continue feeding from unaffected side)
- Prompt treatment of oral thrush
- Heat treatment of expressed breastmilk
- Anti-retrovirals to infant during breastfeeding period
To ensure exclusive breastfeeding occurs – health workers need to be committed to improving breastfeeding practices.

This is only possible if free formula is not distributed and effort is put into promoting BFHI and good breastfeeding practices.
% breastfeeding in non-infected mothers at PMTCT and non-PMTCT sites in Botswana showing “spill-over” effect
% Exclusive Breastfeeding in uninfected mothers at PMTCT and non-PMTCT sites in Botswana showing “spill-over” effect
Assumption:

Because of the risk of HIV transmission through breastfeeding, all HIV infected women should replace breastfeeding (usually with formula feeding) – this implies that there is no risk associated with formula feeding.
Facts:

- There are risks associated with not breastfeeding and these will obviously vary according to different socio-economic conditions.
We need to remember that a similar balance of risks is associated with mode of delivery – vaginal delivery carries more risk for HIV transmission however we don’t automatically recommend c/s in resource poor settings because there are risks attached to this intervention – similar scenario exists in terms of not breastfeeding – cannot simply recommend it because there are substantial risks associated with formula feeding
Risks: HIV Infection with breastfeeding vs Mortality with avoidance of breastfeeding: Global Figures

Babies infected through breastfeeding: 300,000 p.a. (UNAIDS)

Mortality from avoidance of breastfeeding: 1,500,000 p.a. (UNICEF)
what are the risks of not breastfeeding?
Not breastfeeding – results in loss of benefits of breastfeeding:

1. Optimum nutrition until 6 months
2. Protection from infectious diseases
3. Cognitive development
4. Bonding and psycho-social benefits
5. Delays maternal fertility
6. Decreased maternal ovarian and breast cancer
Economic Benefits of Breastfeeding in USA

$3.6 billions could be saved from the Rx of OM, GE, and NEC by merely increasing breastfeeding rates from the current 29% (at 6 mths) to 50%.

*Nutrition Research Report no.13
March 2001,
Jon Weimer, USDA*
Major causes of death in children under five, global figures 2000

- Pneumonia: 20%
- Diarrhoea: 12%
- Malaria: 8%
- Measles: 5%
- HIV/AIDS: 4%
- Perinatal: 22%
- Other: 29%

Deaths associated with undernutrition: 60%

EPI/WHO; Caulfield et al, forthcoming
Not breastfeeding increases mortality

RR of infectious disease mortality among non-breastfed infants

WHO, Lancet 2000

Age (months)
Increasing levels of replacement of breastmilk in the first 3 months is associated with increasing risk of mortality in Zimbabwean study of HIV infected women.

Adjusted HR for BM+NHM (non-human milk) vs EBF = 4.5
Not breastfeeding in the first 2 months significantly increases morbidity in infants born to HIV infected women.  

*Durban VITA/breastfeeding study*

Even early cessation of breastfeeding has been associated with increased morbidity

*Zambia Exclusive Breastfeeding Study*

(personal communication, L Kuhn not to be quoted)

Infants randomised to:
- EBF for 4 mths and then rapid weaning
- EBF for 4 months and gradual weaning:

Early results:
- Infants in group that was rapidly weaned had:
  - increased diarrhoea and ARI
  - significant growth failure
Assumption:

- Decisions on replacement feeding, only need to be made for the negative HIV infants – what about those born HIV positive – an assumption is made that they should be fed with formula milk.
Facts:

The number of children born HIV infected in resource poor settings is about 20% and in those resource poor settings which have instituted the nevirapine regimen to reduce PMTCT this % will drop to about 12% - still a substantial number worth considering – before subjecting them to the risks of formula feeding.
Facts:

HIV infected children who were not breastfed had significantly more recurrent diarrhoea

*Frederick et al, Los Angeles Study 1997 (138 HIV infected children, 43% breastfed)*
Facts:

HIV infected children who were not breastfed progressed to AIDS more quickly

*Frederick et al, Los Angeles Study 1997*

(138 HIV infected children, 43% breastfed)
HIV infected children who were not breastfed had significantly more morbidity

*Durban breastfeeding study*

% of infants who had 3 or more morbidity episodes

Coutsoudis et al. in press, Acta Paediatr, Aug 2003
Facts:

- There is a definite balance of risks which will depend on an individual woman’s situation.
Even with a low infant mortality rate of 40/1000 in breastfed populations like SA, about 1/100 would die of D&P and not breastfeeding, according to the WHO meta-analysis would push this up 6 fold ie 6/100 – so even at this low IMR, risk of formula feeding mortality = risk of HIV transmission thru’ 6 months of mixed breastfeeding (5%)

Most countries in developing world have IMRs in excess (Malawi 132; Kenya 76)
Babies born with HIV – better on breast

Babies who will die of d & p

Babies infected through 6 months mixed breastfeeding will be less with exclusive breast

For most babies 6 months of exclusive breastfeeding will be the best option
If you answer no to any of these questions, formula feeding may not be the best option

• Do you have easy access to clean safe water
• Do you have easy facilities to boil water
• Do you have facilities to sterilise bottles etc.
• Do you have a fridge with regular electricity
• Do you have a guaranteed income of R150/month to spend on formula, bottles, teats, sterilising fluid etc.
• Does your family know your status & will they support you to formula feed
• Will it be acceptable to give f/feeds at night or when baby is crying in public
• Do you have easy access to clinic/hospital if child gets diarrhea
Assumption:

- HIV infected women who breastfeed are at risk for increased mortality.
Facts:

- This assumption is based on one study which has not been validated by a subsequent large meta-analysis.
BF and Maternal death - BHITS

- **Nairobi (Nduati):** Relative risk of death for mothers assigned to BF vs. FF: 3.2 (p=0.01)
- **SA (Coutsoudis):** No significant difference
  - Mortality
    » 0.49% (2/410) ever BF
    » 1.92% (3/156) never BF
  - Morbidity similar between those who BF >3mths vs. those who did not (p>0.1)
- **BHITS:** 4237 mothers included – CD4 associated with mortality but feeding modality only significantly associated with mortality at 12 months and in fact breastfeeding mothers had a lower risk of mortality than mothers who did not breastfeed
Some Research Questions that still remain unanswered

- What is the risk of HIV Tx at 12 and 24 mths if women practice “safe” breastfeeding including exclusive breastfeeding for 6 mths & then continue breastfeeding
- Impact of lactation Mx, nutritional interventions, and antibiotic Rx on clinical and sub-clinical mastitis and thus on Tx risk
- Effect of breastfeeding replacement on infant morbidity and mortality
- Effect of “rapid” and early cessation of breastfeeding
- Effect of breastfeeding on maternal health
- Effect of antiretrovirals to mum, infant or both on Tx
Current Research Underway

- Effect of different breastfeeding patterns on HIV Tx – SA, Cote D’Ivoire, Zimbabwe, Tanzania
- Diffs between rapid cessation of breastfeeding at 4 months compared to gradual weaning off breastmilk at about 2 years - Tanzania
- HIVNET 027 – Safety trial of ALVAC (canary pox) vaccine vs placebo given orally to infants during breastfeeding period - Uganda
- HIVNET 046 – trial of nvp vs placebo given to infants during the first 6 months of breastfeeding – multi-site
- CDC study – trial of HAART to mum vs NVP to infant during breastfeeding period and effect of nutritional support - Malawi
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