REVIEW ARTICLE

HIV Transmission through Breast Feeding: the evidence, stigma, and prevention

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INTRODUCTION

The risk of mother to child transmission is increased if a barest feeding mother is newly infected, owing to the initial high levels of virus. Preliminary evidence suggests that women who were HIV negative in the first year postpartum, and the risk continues in the second year. Mother to child transmission of HIV can occur before, during and after delivery, but only rarely in early pregnancy[1].

Transmission of HIV through breast-feeding is well documented. One of the first report indicates the possibility of HIV transmission through breast milk was of breast fed infants of women who had been infected post-natally through blood transfusion or through heterosexual exposure[2].

RATES OF BREAST-FEEDING TRANSMISSION

According to the little data available in the early 1990, the estimate additional risk of transmission from breast milk is above that of transmission during pregnancy and delivery, among women with established diagnosis of HIV infection. It ranges about 15-20% when the breast-feeding continued for two years or more[3].

The risk of transmission through breast-feeding among the women with recent infection of HIV (acquired postpartum) was twice as high. More recent data from a clinical trial at Nairobi confirms these initial findings. HIV infected pregnant women were randomly selected to either breast feeding (n=212) or artificial feeding (n=213). Compliance with assigned feeing modality was 96% in breast-feeding arm and 70% in formula feeding. Median duration of breast-feeding was 17 months. The cumulative probability of HIV at 24 months of age in breast-feeding and formula feeding was respectively 36.7% and 20.5%. The estimated transmission of HIV through breast-feeding was 16.2% at two year follow up; in breast feeding arm 44.1% of all transmission was attributed to breast-feeding[4].

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PERIOD OF POSTNATAL TRANSMISSION

HIV-1 can be transmitted through breast milk at any point during lactation and thus the rate of infant infection increases with duration of breast-feeding. The persistence of maternal antibodies and the presence of 'window period' during which infection is undetectable by current technology, makes it difficult to determine whether an infant has been infected during delivery (intrapartum) or through breast-feeding immediately after birth. However there are strong evidences that the risk of transmission increases with the duration of breast-feeding, in other words the risk is cumulative[5].

It is also difficult to correlate the transmission by colostrums and mature breast milk. First the colostrums and mature breast milk has different types of cells. Secondly infant ingests much less colostrums than mature milk. Third that the infant immune system is less well develop din the first few days and infant has increased concentration of maternal antibodies. There is no evidence to avoidance of colostrums of colostrums would reduce the risk of breast-feeding transmission to the infants. How ever the highest risk period for transmission of HIV-1 is the first several week of life[6].

MECHANISM OF HIV TRANSMISSION THROUGH BREAST-FEEDING

Although HIV has been detected in breast milk. Not yet reliability quantified are the respective role of cell free and cell associated virus in transmission through breast-feeding, or the association between virus level in plasma and milk. The portal of entry for virus via infant mucosa also merits further investigations animal models has shed some light on this issue[7].

Clinical and sub clinical mastitis in mother is hypothesized to increase 'leakiness' in the cell lining of the breast duct and therefore increases the amount of virus to which an infant is exposed[8].

After ingestion of HIV infected breast milk, infant mucosal surfaces are most likely sites for HIV transmission. Cell free or cellular HIV may penetrate the submucosa in the presence of mucosal breaches or lesions, or via transcytosis through M. cells or enterocytes expressing specific receptors. Laboratory studies suggest that the seretory IgA and IgM may inhibit transcytosis of HIV-1 across enterocytes. The breast milk Immunoglobulines thus may help in

reducing hiv-1 transmission. Tonsils may also be a portal of entry for HIV-1 in breast milk transmission[7].

MATERNAL FACTORS ASSOCIATED WITH RISK OF TRANSMISSION OF HIV-1 THROUGH BREAST FEEDING.

The risk of transmission through breast-feeding is probably strongly related to RNA level in milk. But the degree of risk has not yet been adequately determined. Limited evidences suggest that RNA viral load is only partly correlated with that in the breast milk. RNA load in the breast milk is also highly variable between breasts and overtime.

RNA viral load has been quantified three times in the first three months after delivery in samples taken from both breasts of 145 lactating women. Milk viral load was below the level of detection of HIV RNA PCR assay (<200/mm3) and raised Na+/K+ ratio (a marker of sub clinical mastitis) were significantly associate with increased milk RNA level.

Immune status of mother is also a risk factor for HIV-1 transmission via breast-feeding. In a Meta analysis of data from nine intervention trials in sub Saharan Africa, the risk of postnatal transmission after 4 weeks of age was strongly correlated with low CD4+ cell count. Transmission increases by eight folds at CD4+ count (<200/mm3) of mother[9].

Abnormal condition of breast i.e., clinical or sub clinical mastitis has been associated with transmission risk of HIV-1 from mother to child[8].

FACTORS RELATED TO INFANT IN MTCT OF HIV-1

All clinical conditions that damage the mucous membrane of infants, such as candida infection (oral thrush), may be associated with increased risk of transmission through breast-feeding. It is difficult, however to determine which is caused and which effect, since thrush may be a feature of early HIV-1 infection. Infant oral thrush can also cause nipple thrush and fissure[10].

UNICEF AND UNAIDS RISK FACTORS FOR HIV TRANSMISSION THROUGH BRAEST FEEDING

A number of risk factors increase MTCT of HIV-1 through breast-feeding. These are:

1. Recent infection of mother with HIV: a woman who ahs been infected with HIV during delivery or while breast-feeding can more likely transmit viruses to infants.
2. HIV disease progression: as measured by CD4+ cell count or high viral load in plasma, with or without clinical symptoms.
3. Breast condition: i.e., clinical or sub clinical mastitis, crackled or bleeding nipples or breast abscess.
4. Oral thrush: in infants.
5. Larger duration of barest feeding: increases risk of transmission proportionally.
6. Micronutrient deficiency in mother: this point is weakly evidenced[11].

SITUATION ANALYSIS OF PAKISTAN: HIV AND BREAST FEEING

The first case of HIV in Pakistani citizen was reported in 1983. In Pakistan mother to child transmission of HIV accounts (1.3%) of the total cases reported so far. Heterosexual transmission of HIV/AIDS accounts for the majority (37%) of reported cases, next frequent mode of transmission (18%) being related to contaminated blood or blood products, followed by injecting drug use (4%), homosexual or bisexual sex (6%). Transmission modes for 35% of the reported HIV cases are unknown. In 1993 first recognized transmission of HIV through breast-feeding was reported in Rawalpindi[12].

PREVENTING HIV-1 TRANSMISSION THROUGH BRAEST FEEDING

Primary prevention of HIV-1 transmission through breast-feeding in infants and young children, including transmission through breast milk, is to prevent HIV infection of female adolescents and women of childbearing age. The risk of HIV infection in women is increased by such factors as immaturity of the genital tract, cervical ectopy, sexually transmitted diseases and poor nutrition status. Cultural, social and economic factors also play an important role in contributing HIV transmission, by increasing the vulnerability of female adolescents and women[13.14].

INFANT FEEDING OPTIONS

A woman choice should always be respected and supported.

Counsel on infant feeding choice:

1. Explain the risk of HIV transmission through breast-feeding and not breast-feeding.
2. Five out of 20 babies born to known HIV positive mothers will be infected during pregnancy and delivery without medication. Breast-feeding may infect three more.
3. The risk may be reduced if baby is breast-fed exclusively using technique, so that breasts stay healthy.
4. Mastitis and nipple fissure increases the risk that the baby will be infected.
5. The risk of artificial feeding is also high and they are also risk too diarrhea because of contamination from unclean water, unclean utensils etc. there are also chances of

malnutrition if the milk is to watery or if there is recurrent attacks of diarrhea.
6. Mix feeding may also increase the chances of HIV transmission and diarrhea[15].

If a mother knows and accepts that she is HIV positive, then she has options for feeding. She can use formula feeding as well as breast feeding (exclusive).

1. If mother chooses replacement feeding:

An HIV infected mother who likes to eliminate the he risk of transmission of HIV through breast feeding, needs to avoid the breast feeding from birth and to use replacement feeding with suitable breast milk substitute. A suitable formula is a commercial infant formula or home modified animal milk. Mortality is high for both uninfected and infected infants born to HIV infected mother and may not be associated with mode of feeding[16].

Teach mother about the replacement feeding. Ask her to prepare formula and feed baby by cup. Wash hands with soap and boil water. Clean cup thoroughly. Measure the milk and water and mix them. Feed baby eight times a day. Explain mother about the risk of artificial feeding. Ask her that her baby may get diarrhea if hands, cup or water are not clean. Baby may not grow properly if he/she receives little formula, watery milk or if she/he has diarrhea[15].

2. If mother chooses breast-feeding.

According to world health organization recommendations, infants should be exclusively breast fed for the first six months of life. All mothers should receive counseling that includes general information's about the risk and benefits of various infant-feeding options.

1. Support the mother in choice of breast-feeding.
2. Ensure good attachment and suckling to prevent mastitis and nipple damage.
3. Advise her to return immediately if she has breast symptoms/signs or the baby has any difficulty in feeding.
4. Ensure a visit in first week to assess attachment and positioning and the condition of the mother breasts.
5. Arrange to prepare the possibility of stopping breast-feeding early.
6. Give psychosocial support to the mother[15,17].

UN APPROACHES TO PREVENT MTCT OF HIV

In May 2002 in a special session of the united national assembly pledged to reduce HIV proportion of infants by 20% by 2005 and by 50% by 2010. UN strategic approach covers four areas to reduce MTCT of HIV. These are,

1. Prevent HIV infection in young and pregnant women.
2. Prevention of unintended pregnancies in HIV infected women.
3. Prevention of HIV infection from mother to their infants.
4. Provision of care, treatment and support to infected mothers, infants and families[18].

GIVE ANTIRETROVIRAL DRUGS TO NPREVENT MTCT OF HIV

1. Explain the woman that the drug has been shown to greatly reduce the risk of the baby.
2. Explain to her that to receive ARV prophylactic treatment, she must:
3. Attend antenatal care regularly,
4. Know her HIV status,
5. Be counseled on infant feeding,
6. Deliver with skilled attendant preferably in hospital and
7. Be able and welling to take drugs as prescribed.
8. If treatment with zidovudine is planned, obtain a hemoglobin determination early; if less than 8g/dl, treat anemia urgently.
9. Tell him to take the labour dose of the drug a s soon as labour starts and show her how to take it.

ARV prevention of MTCT of HIV-1.drugs for [15]

ARV drugs	When to give	Dose	Frequency	Comment
Zidovudine 1 tablet=300mg	From 36 weeks of pregnancy till onset of labour. From onset of labour till delivery.	300mg(I tablet). 300mg(I tablet).	Every 12 hours. Every 3 hours	No treatment for baby.
Nevirapine 1 tablet=200mg (woman)	**For woman:** as early in labour. **For baby:** within 72 hrs of birth.	200mg(I tablet).	Once daily	If she vomits within first hour, repeat dose. If mother received nevirapine I hr before delivery.
Nevirapine Oral solution 50mg/5ml (baby)	**For baby:** within 72 hrs of birth	2mg/kg	Once daily	As soon after birth.

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