

HIV Infection via Mother to Child Transmission By Eleanor Turnbull

The Human Immunodeficiency Virus (HIV) is a virus that is found in blood and other body fluids, such as breast milk. The virus infects CD4 cells, found in our blood, which are part of our immune system. CD4 cells are weakened by the presence of the HIV, and become unable to replicate. This prevents the immune system from working properly and culminates in HIV-positive people catching diseases and infections faster and with more severity; the person will eventually develop Acquired Immunodeficiency Syndrome (AIDS) which is terminal. HIV infection can occur by a number of different modes of transmission; in children the most common route of HIV infection is via Mother to Child Transmission (MTCT). In the absence of antiretroviral therapy, approximately 25% of pregnant HIV-infected women will transmit the virus to their child.¹

HIV Transmission Routes

Mother to child transmission of HIV can occur during pregnancy, labour, delivery, or breastfeeding; 15 – 35% of infants born to HIV-positive women are infected during delivery, by placental processes. A child is more likely to contract HIV from her mother if she has advanced HIV infection or AIDS; she has a high viral load or a low CD4 count; her waters break at least four hours before delivery; the labour is difficult; she has a genital infection (e.g. a sexually transmitted infection, such as Chlamydia); she uses illicit drugs during pregnancy; or she actually becomes infected with HIV during the pregnancy.

In countries with high HIV-seroprevalance of pregnant women, such as in Kenya (16%²) and Zambia's (24%³), roughly one in ten infants will be delivered infected with HIV, unless preventative mother to child transmission HIV chemotherapy is available⁴. The incidence of paediatric infections, which account for 10% of new global infections, can be pushed higher still by near-universal breast feeding; a Nairobi study documented that 40% of all infants born to HIV-infected women acquired infection through breast feeding and during the first few months of life. National preventative MTCT programmes are now in place across Africa and access to these interventions is increasing significantly; this will hopefully result in lower numbers of children living with HIV.

¹ Connor EM, Sperling RS, Gelber R, et al. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. *New England Journal of Medicine* 1994;331:1173–1180

² De Cock, K.M., Fowler, M.G., Mercier, E., De Vincenzi, I., Saba, J., Hoff E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. *JAMA* 2000, 283:1175–1182

³ Prevention of mother-to-child transmission of HIV in Africa: successes and challenges in scaling-up a nevirapine-based program in Lusaka, Zambia. *AIDS*. 17(9):1377-1382, June 13, 2003. Stringer, Elizabeth M a-c; Sinkala, Moses a-d; Stringer, Jeffrey SA a-c; Mzyece, Elizabeth c; Makuka, Ida c; Goldenberg, Robert L a,c; Kwape, Pascal e; Chilufya, Martha e; Vermund, Sten H a,c

⁴ Fylkesnes K, Musonda R, Kasumba K, Mubanga, Musonda R, Sichone M. The HIV epidemic in Zambia: socio-demographic prevalence patterns and indications of trends among childbearing women. *AIDS* 1997, 11:339–345.

Methods of Prevention

Successful programmes to prevent MTCT are complex interventions, of which drug therapy is but one component and should be used only as a last resort. Primarily prevention methods should focus on targeting young girls and women, to prevent them becoming infected with HIV, and then helping them to avoid unwanted pregnancy; advocating condom use and implementing life-skills programmes into schools has been found to be notably successful, particularly when the dangers of “Sugar-daddies” are addressed. Girls from resource poor areas have commonly been known to enter sexual relationships with older men, known as ‘Sugar-daddies’ to finance ‘beauty’ costs (for hair-styling and clothes) so as to upkeep an expected and respectable appearance; Sugar-daddies generally have a high turn-over rate of sexual partners and hence a significant risk of HIV infection.

A further prevention method issue that must be addressed is the lack of awareness in pregnant women about their HIV sero-status. Poor uptake of voluntary testing in resource poor countries after decades of HIV education is reflected in estimates that the majority of HIV positive people (>90%) don't know they are infected⁵. Women are particularly fearful of accessing health services or antenatal clinics, for HIV testing, as the traditional hierarchical society that many women live in means that she is concerned that her husband or his family may be told of the HIV-test results. Stigmatising attitudes towards HIV testing and HIV-positive women are prevalent in many communities; if tests results come back positive then a woman might worry that she will experience violence or abandonment⁶, and face losing any children she may have already borne. Furthermore, very unfairly, it is common that which ever family member is tested first, particularly if it is a woman, is pinpointed as being the primary source of HIV infection within that family, and the cause of other family members infection; they then face undue discrimination and may be disowned by their families. Stigma and discrimination must be fought within communities so that people who are infected with HIV are cared for and supported; health and antenatal clinics must learn to respect the privacy of patients, provide women with “safe” testing, and when necessary provide them with Nevirapine, alongside relevant advice and counselling, as detailed below.

Preventative MTCT HIV chemotherapy

Prophylaxis antiretroviral medication is one method of dramatically reducing HIV-transmission from the mother to her child. Short course therapy using ARV drugs, such as Zidovudine and Nevirapine, administered in late pregnancy, labour and delivery and then to the newborn, as well as elective caesarean section for women with high viral loads, can reduce the rate of perinatal HIV transmission to 2% or less.⁷ One regime that has been proved to be highly efficacious is ARV prophylaxis started in the 28th week of pregnancy; Zidovudine is given twice-daily in combination with a single-dose of Nevirapine given to the mother and child at birth. This regime can put undue pressure on programmes and on the women who participate, when it is not feasible or practical another regime can be used; if the mother takes one tablet of Nevirapine when she starts having labour pains (this does not need to be at a clinic or hospital, she can take

⁵ UNAIDS/WHO Policy (2004): www.who.int/bulletin/volumes/84/1/52.pdf

⁶ Integrating prevention of mother-to-child HIV transmission into antenatal care: learning from the experiences of women in South Africa. M.-a. Etiebet A1, D. Fransman A2, B. Forsyth A3, N. Coetzee A4, G. Hussey A2

⁷ CDC. Revised recommendations for HIV screening of pregnant women. *MMWR* 2001;50(No. RR-19):59–85

the pill at home), and if the new baby is given one dose of Nevirapine (within 72 hours of delivery), the risk of the baby getting HIV from its mother is cut in half, and reduced to less than 10%. This method of prevention of MTCT has been shown to be feasible and cost effective in resource-limited settings, such as Lusaka, where thousands of women have received voluntary counselling and testing and Nevirapine therapy⁸. Nevirapine is a drug that makes it harder for HIV to replicate and hence decreases the viral load of HIV in the mother's body and lessens the chance of passing the virus to her new child⁹. Children born to mothers exposed to antiretroviral therapy in pregnancy show no increased risk of birth defects or growth problems,¹⁰ there are however concerns about the possible emergence of Nevirapine resistance; this topic is currently being researched further.

HIV Transmission via Breastfeeding

Women with HIV face the dilemma of choosing the right infant feeding option; trying to prevent HIV transmission to their infants while not exposing them to the risk of malnutrition and other illnesses, which have been shown to occur when an infant is not breastfed. In developing countries as many as 54% of all deaths among children under the age of five are associated with malnutrition. The WHO guidelines state that when replacement feeding (milk formula) is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended¹¹. When considering whether to use replacement feeding it is particularly important to remember that it is vital that the milk formula is only made up using clean water in sterilised containers. In a situation where there is no safe alternative to breast milk WHO then recommends that a child is exclusively breastfed during the first six months of life¹²; the infant must only receive breast milk from the mother or a wet nurse. Numerous expert studies have shown that mixed feeding, with both breast milk and replacement feeds, has been associated with a higher risk of HIV infection for the infant than exclusive breastfeeding; mixed feeding should be avoided because it increases the risks of both HIV infection and the risks of acquiring diarrhoea and other infectious diseases.

Conclusion

In summary, pregnant women who are living with HIV can utilize the methods available to help prevent transmission; however these do not guarantee 100% prevention and are only available to the small percentage of women who actually know that they are infected. In the first instance the socio-economic issues that mitigate HIV transmission, place women and girls at risk of HIV infection, and prevent women from accessing testing, must be tackled. Stigma and discrimination must be openly discussed and addressed within every community, in order to facilitate an increase in the number of people accessing testing, counselling, and when necessary treatment for themselves and to protect their unborn children.

⁸ AIDS. 17(9):1377-1382, June 13, 2003.

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⁹ http://www.globaltreatmentaccess.org/content/tx_prep/mtct.html

¹⁰ Mother to Baby Transmission fact sheet -- AIDSMap at: <http://www.aidsmap.com/publications/factsheets/fs28.htm>

¹¹ HIV and Infant Feeding, WHO, 2003

¹² WHO Guidelines