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Prevention of mother-to-child transmission of HIV-1 through breastfeeding by treating infants or mothers prophylactically with antiretrovirals in Dar es Salaam, Tanzania: the MITRA and MITRA PLUS studies

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Background

Short course antiretroviral (ARV) treatment around delivery reduces early mother-to-child transmission (MTCT) of HIV-1 by 35-60 %. However, additional interventions are required to prevent postnatal transmission through breastfeeding. We have performed two studies (MITRA and MITRA PLUS) to investigate the possibility to reduce MTCT of HIV-1 by prophylactic ARV treatment of infants or mothers during breastfeeding.

Materials and methods

In the MITRA study HIV-1 infected pregnant women were treated during late pregnancy and for one week after delivery with two ARV drugs, zidovudine (ZDV) and lamivudine (3TC). Infants were treated with these drugs for one week after birth and then with 3TC alone during breastfeeding (maximum 6 months). In the MITRA PLUS study the HIV-1 infected mothers were treated with three ARV drugs, ZDV+3TC+nevirapine (NVP) during late pregnancy and breastfeeding (NVP was replaced by nelfinavir for mothers with adverse reactions on NVP). Treatment of the mothers was stopped at six months except for those who needed ARV treatment for their own health. In both studies mothers were counseled on exclusive breastfeeding and encouraged to stop at six months. Transmission of HIV-1 was analyzed using the Kaplan Meier survival technique.

Results

In the MITRA study 398 infants were included in the transmission analysis. The cumulative proportion of HIV-infected infants was 3.8% (95%CI 2.0%-5.6%) at 6 weeks and 4.9% (95%CI 2.7%-7.1%) at 6 months of age. In the MITRA PLUS study there were 440 infants included in the transmission analysis. The proportion of HIV-1 infected infants was 4.1% (95%CI 2.1%-6.0%) at 6 weeks and 5.0% (95%CI 3.2%-7.0%) at 6 months. The median time of breastfeeding was 18 weeks in the MITRA study and 24 weeks in the MITRA PLUS study. NVP-related skin reactions occurred in 24 (5.5%) of 433 NVP-treated women, of whom 6 had Steven Johnson syndrome. All women with skin reactions had CD4 cell counts > 200/mm^3.

Conclusions

The HIV-1 transmission rates at 6 weeks and 6 months after delivery in the MITRA and MITRA PLUS studies were similar and are among the lowest reported in a breastfeeding population in sub-Saharan Africa. The strategy used in the MITRA PLUS study is the obvious choice for mothers who need ARV treatment for their own health whereas prophylactic ARV treatment of the infant during breastfeeding could be a possible choice for mothers with high CD4 cell counts.