Mma Bana: Lowest-Ever Mother-to-Child HIV Transmission Rates With Combo Therapy in Botswana

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Not only can combination antiretroviral therapy be used with confidence to prevent mother-to-child HIV transmission (MTCT) during pregnancy and delivery in resource-poor countries, but it can also be used safely and effectively to prevent the spread of the virus during breast feeding. These results, from the first randomized clinical trial evaluating combination ARV regimens in pregnancy and during breast feeding, were reported Wednesday, July 22, at the Fifth International AIDS Society (IAS) Conference on HIV Pathogenesis, Treatment and Prevention in Cape Town.

The use of combination ARV therapy to prevent MTCT is one of the most successful public health interventions in recent times. Differences may exist between different regimens with respect to pregnancy outcomes, side effects, virologic efficacy and MTCT reduction, but little research is available to discern such disparities. What's more, few data are available regarding the use of ARV therapy to prevent MTCT during breast feeding. Breast feeding is a mainstay of infant nutrition—even when the mother is infected with HIV—in parts of the world where formula feeding is neither safe nor feasible.

The National Institutes of Health (NIH)–funded Mma Bana study—meaning "mother baby" in Setswana—was conducted at four clinical sites in Botswana as a collaboration between the Harvard School of Public Health in Boston and the Botswana government. The primary goal of the study, explained lead author Roger Shapiro, MD, MPH, of Harvard, was to compare the suppression of viral load to less than 400 copies at delivery and throughout breast feeding among women allotted to receive different ARV regimens, and to determine the MTCT rate after six months of breast feeding among all women who received ARV therapy.

Women were instructed to exclusively breast-feed and to wean their infants from breast milk at six months of age. Seventy-one percent of women in the study breast-fed for at least five months, and fewer than 1 percent of women breast-fed beyond 6 months.

One group of 560 women with CD4 counts of at least 200 were randomized to take either abacavir, zidovudine and lamivudine (coformulated as Trizivir in the United States), group A; or lopinavir/ritonavir (Kaletra) and lamivudine/zidovudine (Combivir), started between weeks 26 and 34 of their pregnancies, group B.

A second group of 170 pregnant HIV-positive women—those with fewer than 200 CD4 cells—were enrolled in a third group (group C) in which therapy containing nevirapine (Viramune) and zidovudine/lamivudine was initiated by everyone between weeks 18 and 34 of pregnancy.

All regimens used in the study were highly effective at reducing viral load. At birth, 96 percent of the women in group A, 93 percent of the women in group B and 95 percent of the women in group C had viral loads below 400. During breast feeding while on combination therapy, 92 percent in group A, 93 percent in group B and 95 percent in group C had viral loads below 400.

MTCT was very low. The overall transmission was 1 percent—on a par with that seen in industrialized nations. In group A, there were three pregnancy-related transmissions and two breast-feeding transmissions. In group B, there was one pregnancy-related transmission and no breast-feeding transmission. Similar results were seen in group C—only one transmission during pregnancy, with no transmissions while breast-feeding.

Shapiro said that these are the lowest MTCT rates ever recorded in a study from Africa, or among breast-fed infants.

The ARV regimens used were safe and generally well tolerated. According to Shapiro, treatment-limiting adverse side effects occurred in 2 percent of both groups A and B, and 11 percent of women with more advanced HIV in group C. Infant mortality, at or before six months of age, was 3 percent overall.

Babies born prematurely or with low birth weights were common, but it is unclear if this was related to the HIV treatments used during pregnancy and breast feeding, or to other factors common to sub-Saharan Africa that can affect infant health.

Maternal ARV therapy from early in the third trimester of pregnancy through six months of breast feeding, Shapiro said, is a safe and effective strategy for preventing MTCT while allowing for the benefits of breast feeding.

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