Recommendations for Use of Antiretroviral Drugs in Pregnant HIV-1-Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV Transmission in the United States

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Mechanisms of Action of Antiretroviral Prophylaxis in Reducing Perinatal Transmission of HIV (Last updated July 31, 2012; last reviewed July 31, 2012)

Panel's Recommendation
• Antiretroviral (ARV) drugs reduce perinatal transmission by several mechanisms, including lowering maternal antepartum viral load and providing infant pre- and post-exposure prophylaxis. Therefore, combined antepartum, intrapartum, and infant ARV prophylaxis is recommended to prevent perinatal transmission of HIV **(AI)**.
Rating of Recommendations: *A = Strong; B = Moderate; C = Optional*
Rating of Evidence: *I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion*

Antiretroviral (ARV) drugs can reduce perinatal transmission through a number of mechanisms. Antenatal drug administration decreases maternal viral load in blood and genital secretions, which is a particularly important mechanism of action in women with high viral loads. Even among women with HIV RNA levels <1,000 copies/mL, however, ARV drugs have been shown to reduce risk of transmission.[1] In addition, the level of HIV RNA at delivery and receipt of antenatal ARV drugs are independently associated with risk of transmission, suggesting that reduction in viral load is not solely responsible for the efficacy of ARV prophylaxis.[2, 3]

Another mechanism of protection is infant pre-exposure prophylaxis achieved by administering ARV drugs that cross the placenta from mothers to infants and produce adequate systemic drug levels in the infants. This mechanism of protection likely is particularly important during passage through the birth canal, a time when infants receive intensive exposure to maternal genital-tract virus. Infant post-exposure prophylaxis is achieved by administering drugs to infants after birth. This intervention provides protection from cell-free or cell-associated virus that may have entered the fetal/infant systemic circulation through maternal-fetal transfusion associated with uterine contractions during labor or systemic dissemination of virus swallowed during infant passage through the birth canal.

The efficacy of ARV drugs in reducing perinatal transmission likely is multifactorial, and each of the mechanisms previously described may make a contribution. The importance of the pre- and post-exposure components of prophylaxis in reducing perinatal transmission is demonstrated by the efficacy of interventions that involve administration of ARVs only during labor and/or to the newborns, discussed in the next section.[4-10]

References

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