

January 9, 2009

Brief Meeting Summary:
“CDC Expert Consultation on the Effect of Antiretroviral Therapy on Risk of Sexual Transmission of HIV Infection and Superinfection”

Background:

The Centers for Disease Control and Prevention (CDC) sponsored a meeting in Atlanta on October 23-24, 2008, entitled, “CDC Expert Consultation on the Effect of Antiretroviral Therapy (ART) on Risk of Sexual Transmission of HIV Infection and Superinfection.”

Approximately 50 HIV experts attended including laboratory scientists, clinicians, social and behavioral scientists, and public health personnel from CDC and other federal agencies, state and local health departments, universities, advocacy groups, and international organizations. Participants reviewed available data and discussed implications for treatment and prevention programs and for future research.

Initial presentations reviewed the biology of sexual HIV transmission, with an emphasis on the correlations between viral load and antiretroviral drug concentrations in the blood, genital and rectal compartments. There were presentations of mathematical models to estimate the population-level impact of ART on infectivity, and data were reviewed on transmission between HIV-infected partners (superinfection). Research on individuals’ perceptions of HIV transmission risk in the setting of effective ART and the influence of these perceptions on risk behavior and related ethical and public health communication challenges were discussed. In breakout sessions, participants discussed what is known about ART and prevention, programmatic implications, and additional research that is needed on biomedical, ethical, behavioral and communications issues and mathematical modeling.

Outcome:

The presentations and discussions indicated that there is evidence that the infectiousness of HIV-infected persons is related to their blood viral load, which is correlated with genital viral shedding. ART can be expected to reduce HIV concentrations in the blood and seminal plasma, female genital tract secretions, and rectal secretions. While some studies have shown successful long-term suppression of genital HIV shedding with ART, in other studies episodes of genital HIV shedding have been observed despite ongoing ART. There is also significant variation in the penetration of antiretroviral drugs from the blood into the genital tract. Observational studies to date have shown that ART is associated with a decreased risk of transmission to sex partners. A clinical trial to directly address this question is ongoing.¹

Experts emphasized methodological challenges, especially in quantifying vaginal and rectal viral shedding, the lack of data on rectal transmission and the effect of ART on transmission among men who have sex with men, and the unknown durability of the effect of ART on transmission. There were also concerns related to the effects on anogenital viral shedding of

¹HIV Prevention Trials Network. HPTN 052 - A Randomized Trial to Evaluate the Effectiveness of Antiretroviral Therapy Plus HIV Primary Care versus HIV Primary Care Alone to Prevent the Sexual Transmission of HIV-1 in Serodiscordant Couples. Available at: http://www.hptn.org/research_studies/hptn052.asp. (Accessed January 9, 2009).

blood viral load “blips,” intermittent and potentially asymptomatic sexually transmitted infections, and drug-resistant viral strains.

At the population level, some studies have found that ART has reduced HIV transmission, while others have not shown such a reduction. Some modeling studies suggested that widespread ARV treatment would substantially reduce HIV transmission, although behavioral risk compensation could possibly undermine that effect. Other modeling research that was presented indicated that as the proportion of HIV-infected individuals on ART with complete viral suppression increases, as might be achieved with more potent and tolerable regimens, the relative contribution to transmission increases for those who are aware of their infection but are not yet on ART.

Discussions on the public health impact of ART as prevention considered the related issues of beginning ART earlier in the course of infection at higher CD4 counts for clinical reasons. While current U.S. guidelines recommend starting ART at a CD4 count of $<350/\text{mm}^3$, the guidelines state that other potential benefits to starting treatment earlier may be taken into consideration including the “decreased risk of HIV transmission to others, which will have positive public health implications.” Participants raised concerns about ART adherence, behavioral risk compensation, clinical capacity and financing for ART for individuals with higher CD4 counts.

Ethical discussions emphasized that safeguards should be in place to enhance the positive contributions of ART to HIV prevention while reducing unintended negative consequences. Participants stressed that clear, accurate information about what is known to date must be made available to the public. The complexities of communicating about risk were acknowledged; it was also noted that communications should emphasize the importance of adhering to treatment and to other prevention modalities, including condom use.

Conclusion:

The consultation highlighted the contribution of ART to prevention of HIV transmission, and the potential to increase the prevention benefit by expanding HIV testing, ensuring linkage to and availability of treatment services, and, possibly, making treatment available to infected individuals with CD4 counts $>350/\text{mm}^3$. However, additional laboratory, clinical, epidemiologic, mathematical modeling, and behavioral research, along with health care financing and policy discussions, are needed to inform specific guidance on these issues.

CDC is planning to issue a fact sheet on what is currently known about ART and sexual transmission on the CDC website in the first quarter of 2009. CDC will also submit a scientific statement for publication in a peer-reviewed scientific journal. CDC reiterated its recommendation that people living with HIV who are sexually active use condoms consistently and correctly with all sex partners.²

² **Centers for Disease Control and Prevention.** CDC Underscores Current Recommendation for Preventing HIV Transmission. Available at: <http://www.cdc.gov/hiv/resources/press/020108.htm>. (Accessed January 9, 2009).