



## **Hormonal Contraceptives and HIV Risk—Emerging Evidence in Context**

### **The existing body of evidence**

- Numerous analyses have tried to ascertain whether hormonal contraceptives lead to increased risk of HIV acquisition or transmission. There are several mechanisms by which hormonal contraceptives could theoretically increase the risk of HIV acquisition or transmission, but data supporting many of these are limited and inconclusive. Systematic reviews of these studies have concluded that the weight of evidence suggests no relationship between hormonal contraceptive use and HIV acquisition or transmission and that there is need for conclusive research to be undertaken.<sup>1-5</sup>
- Among all women, those in Sub-Saharan Africa not only face the highest risk of maternal mortality and morbidity, but also the highest risk of HIV infection.<sup>6,7</sup> Voluntary contraception is crucial for women who have or are at risk of HIV because it helps prevent unintended pregnancy and its health risks.<sup>8,9</sup> In Sub-Saharan Africa, where HIV infection rates are especially high, hormonal contraceptives are the most commonly used methods: Twelve 12 million women use injectable contraceptives and eight million use oral contraceptives; another 11 million women rely on nonhormonal methods—condoms, sterilization or IUDs.<sup>10</sup>

### **A new study by Heffron et al.**

- On July 20, 2011, a group of researchers led by Renee Heffron of the University of Washington, presented findings indicating two-fold increases in the risks of both HIV acquisition and HIV transmission among women in HIV-discordant couples (those in which only one person was HIV positive at study enrollment) using hormonal contraceptives, particularly the progestin-only injectable, compared with women not using hormonal contraceptives.<sup>11</sup>

### **Implications**

- This new evidence needs to be taken seriously, but, by itself, it does not warrant changes to current programs because
  - it has some scientific limitations that may render the findings less conclusive than they initially appear;
  - these findings, and the study's strengths and limitations, have yet to be weighed along with other available evidence;
  - another analysis of these data found that pregnancy itself doubles the risk of transmitting HIV and that pregnancy also doubles risk of acquiring HIV (though largely because of differences between pregnant and nonpregnant women in age, contraceptive use and sex unprotected by condoms), findings that, if accurate, have serious implications of their own;<sup>12</sup> and

- programmatic changes in contraceptive availability, if made without accurate evidence, might lead women to unnecessary and severe tradeoffs (such as more unintended and high-risk pregnancies and potential recourse to unsafe abortion) that need to be carefully weighed against potential risks of HIV infection.

## **Recommendations**

- Contraceptive and HIV service providers and educators should continue to counsel women and couples about the importance of consistently using condoms in conjunction with hormonal and other nonhormonal contraceptives for the prevention of HIV and other sexually transmitted infections (STIs).
- Programs should improve access for women and their partners to a wide range of contraceptive choices, including hormonal and nonhormonal methods.
- Top priority should be given to initiating high-quality research specifically designed to examine potential links between hormonal contraceptives and HIV acquisition and transmission.
- Technical review of the entire body of existing research should be conducted to determine whether contraceptive eligibility standards—which currently recommend hormonal contraceptives without restriction for women who are at risk of HIV or who are HIV-positive—should be changed.<sup>13</sup>
- Research efforts and funding should be increased to identify and develop new modes of contraception, including those that simultaneously protect against pregnancy, HIV and other STIs.

## **About the study by Heffron et al.**

The study by Heffron and colleagues has not yet been peer-reviewed or published; findings are currently available only in slide and oral form. The researchers analyzed data from women and men in HIV discordant couples. These data were collected as part of studies designed for purposes other than assessing links between hormonal contraceptive use (or pregnancy) on HIV acquisition and transmission. Most (88%) of the couples for whom data were available were participants in a randomized placebo-controlled trial—conducted in 14 locations within seven Sub-Saharan African countries—assessing the efficacy of acyclovir in preventing HIV infection associated with herpes simplex infection.<sup>14-15</sup> Data for the other 12% of couples in the analysis came from a parallel observational study of immune correlates of HIV protection at two of the same study sites.

Participants in these studies were provided with comprehensive HIV-prevention services, including risk-reduction counseling for individuals and couples, free condoms and STI treatment. They were offered contraceptives on a voluntary basis at the study site or on referral, or both. Every three months, women were asked what contraceptive method, if any, they had used in the past three months, and women and their partners were tested to identify new HIV infections. The analysis compared new HIV infection rates in three-month periods

during which women at some point used a hormonal method to rates in three-month periods during which women used no hormonal method (i.e., either used no contraceptive at all or relied on condoms alone, tubal sterilization or hysterectomy). Most couples in both groups reported using condoms. Women in a minority (29%) of couples used hormonal contraceptives at least once during the study. Most hormonal method use was of the progestin-only injectable. Data on adherence to method use requirements and brand of contraception were not collected.

Since participants were not randomly assigned to contraceptive use and method type, the researchers used statistical techniques to attempt to adjust for differences between hormonal method users and nonusers. They adjusted for age, HIV viral load at enrollment, sex without a condom with the study partner and pregnancy, which were the only available study variables reported to have substantial effects on the relationship between contraceptive use and HIV infection. Two forms of statistical modeling (Cox proportional hazards regression and marginal structural modeling) produced similar results indicating higher HIV acquisition and transmission rates during periods when hormonal contraceptives were used than during periods with no hormonal method use. The elevated risks were statistically significant among those using progestin-only hormonal methods. Although the estimates for oral contraceptive pills were also elevated, they were not statistically significant, possibly due to the small number of women in the analysis using that method.

This study has a number of strengths, including studying discordant couples in which there was clear risk of the HIV-negative person becoming infected, use of genetic sequencing to identify and include only cases of HIV transmission from study women to their partners, inclusion of participants from a range of countries and study sites in Sub-Saharan Africa, a prospective design with frequent assessment of contraceptive use and use of two different types of statistical analysis.

It also has a number of limitations. For example, women were not randomized according to contraceptive method use; statistical methods and variables collected in the study may not adequately adjust for differences between those who used hormonal methods and those who did not, including possible differences in sexual behavior and condom use; the measure of ever-use of a hormonal method during a three-month period may not represent use at the time the infection occurred; and some variables, including hormonal contraceptive use and condom use, may not have been accurately reported by respondents. These and other issues will need exploration in the evaluation of the Heffron et al. study. However, many such limitations are inherent in secondary analysis of observational data. New research is needed to know for sure whether hormonal contraceptive use is an independent factor in HIV acquisition and transmission.

**For questions, please contact:**

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- <sup>1</sup> World Health Organization (WHO), *Medical Eligibility Criteria for Contraceptive Use*, 4th ed., Geneva: WHO, 2010.
- <sup>2</sup> Blish CA and Baeten JM, Hormonal contraception and HIV-1 transmission, *American Journal of Reproductive Immunology*, 2011, 65(3):302–307.
- <sup>3</sup> Curtis KM, Nanda K and Kapp N, Safety of hormonal and intrauterine methods of contraception for women with HIV/AIDS: a systematic review, *AIDS*, 2009, 23(suppl. 1):S55–S67.
- <sup>4</sup> Morrison CS, Turner AB and Jones LB, Highly effective contraception and acquisition of HIV and other sexually transmitted infections, *Best Practices and Research Clinical Obstetrics and Gynecology*, 2009, 23(2):263–284.
- <sup>5</sup> WHO, *Review of Priorities in Research on Hormonal Contraception and IUDs and HIV Infection*, Geneva: WHO, 2010.
- <sup>6</sup> WHO, *Trends in Maternal Mortality, 1990 to 2008: Estimates Developed by WHO, UNICEF, UNFPA and The World Bank*, Geneva: WHO, 2010.
- <sup>7</sup> Joint United Nations Programme on HIV/AIDS (UNAIDS), *Global Report: UNAIDS Report on the Global AIDS Epidemic 2010*, Geneva: UNAIDS, 2010.
- <sup>8</sup> Singh S et al., *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*, New York: Guttmacher Institute and United Nations Population Fund, 2009.
- <sup>9</sup> WHO, *Towards the Elimination of Mother-to-Child Transmission of HIV, Report of a WHO Technical Consultation*, Geneva: WHO, 2011.
- <sup>10</sup> Darroch JE, Sedgh G and Ball H, *Contraceptive Technologies: Responding to Women's Needs*, New York: Guttmacher Institute, 2011
- <sup>11</sup> Heffron R et al., Hormonal contraceptive use and risk of HIV-1 transmission: a prospective cohort analysis, abstract, Rome: 6th IAS Conference on HIV Pathogenesis, Treatment and Prevention, 2011, <<http://pag.ias2011.org/Abstracts.aspx?SID=10&AID=1715>>, accessed Aug. 5, 2011.
- <sup>12</sup> Mugo NR et al., Increased risk of HIV-1 transmission in pregnancy: a prospective study among African HIV-1 serodiscordant couples, *AIDS*, 2011, doi: 10.1097/QAD.0b013e32834a9338.
- <sup>13</sup> WHO, *Medical Eligibility Criteria for Contraceptive Use*, 4th ed., Geneva: WHO, 2010.
- <sup>14</sup> Celum C, Acyclovir and transmission of HIV-1 from persons infected with HIV-1 and HSV-2, *New England Journal of Medicine*, 2010, 362(5):427–439.
- <sup>15</sup> Heffron R et al., A prospective study of contraceptive use among African women in HIV-1 serodiscordant partnerships, *Sexually Transmitted Diseases*, 37(10):621–628.