

Viral load best predictor of HIV transmission

The higher the concentration of human immunodeficiency virus type 1 (HIV-1) in the bloodstream, the greater the risk of transmitting the virus to a partner during heterosexual intercourse, a large study conducted in sub-Saharan Africa has found. The number of copies of HIV-1 ribonucleic acid (RNA) in the blood, an indicator of viral load, was a better predictor of whether transmission would occur than many other factors, such as the presence of other sexually transmitted diseases (*New England Journal of Medicine*, 2000, **342**: 921–929).

Thomas C. Quinn, Professor of Medicine at Johns Hopkins University in Baltimore, MD, said the study found a clear dose–response relationship between viral load and transmission. “For every 10-fold rise in the concentration of HIV in the bloodstream, transmission more than doubled,” he said.

Conducted in the Rakai district of Uganda by researchers from the United States and Uganda, the project involved following 415 couples where only one partner was HIV-positive. All participants received free condoms, voluntary confidential HIV testing and counselling, as well as health education directed at preventing HIV transmission. Researchers visited the couples at 10-month intervals for up to 30 months. At each visit, the participants gave blood samples and these were later tested to determine HIV viral load. Over the period of the study, 90 (22%) of the previously uninfected partners became HIV-positive. Analysis of the blood tests showed that in nearly 80% of these cases, the viral load of the infected partner was above 10 000 copies of HIV-1 RNA/ml of blood. No one who had fewer than 1500 copies of HIV-1 RNA/ml of blood transmitted the virus to his or her partner.

Quinn added that the findings were “strikingly consistent” with studies of viral load in cases of mother-to-child HIV infection. He said: “Theoretically, just as drugs have helped reduce perinatal transmission, antiretroviral regimens that dampen HIV viral load should also be effective against heterosexual transmission of HIV. But we need more studies to confirm this”.

Nelson Sewankambo, Dean of Medicine at Makerere University in Uganda and the principal investigator in Uganda for the study, said its findings demonstrated the need to develop “low-cost and feasible methods of reducing viral load for use in resource-poor settings”. The study also showed that male circumcision may also play a part in controlling the spread of HIV. Among the 187 seronegative men who had HIV-positive partners, none of the 50 who were circumcised became infected, compared to 40 of the 137 who were not circumcised.

Commenting on the paper in an accompanying editorial (*New England Journal of Medicine*, 2000, **342**: 970–972), Myron S. Cohen of the University of North Carolina at Chapel Hill, NC, said this finding might lead countries where HIV-1 is endemic or epidemic to consider promoting circumcision for its public health benefits. But he added: “However, the promotion or institution of a procedure that has profound cultural implications, risks of complications and benefits that are realized only decades later represents a formidable public health and political challenge”. ■

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