

Treatment as Prevention: Some Additional Thoughts

Roger Detels^a and Dean L. Winslow^b

AIDS 2011, 25:000–000

The authors of the paper “High HIV incidence among MSM prescribed postexposure prophylaxis in Amsterdam, 2000–2009: indications for ongoing sexual risk behaviour” by Sonder *et al.* are to be commended for conducting a relevant, timely study elucidating the complexities of depending on post-exposure prophylaxis (PEP) to reduce the acquisition and transmission of HIV among MSM. The study was well designed and included an appropriate comparison group with which to compare the HIV infection risk among PEP users.

This paper is particularly relevant, given the surge of recent papers demonstrating the potential of treatment as prevention for HIV/AIDS through the use of microbicides by vulnerable women, protection of uninfected partners through treatment of the infected partner, and prophylactic treatment of uninfected partners of discordant MSM couples [1–3]. These publications have generated euphoria about the ability of treatment to quell the epidemic of HIV. This paper by Sonder *et al.* suggests that the euphoria needs to be tempered.

The investigators found that the risk of HIV infection among men possibly exposed to HIV who used PEP was almost four times higher than among a younger cohort of similar men concurrently followed in the Amsterdam Cohort Study of MSM. The authors correctly state that this finding probably reflects the higher level of risk activities among men using PEP rather than a failure of PEP. Of the 11 men who seroconverted, only 2 of the 359 (0.5%) seroconverted within a time frame compatible with the exposure for which PEP was taken, and therefore might reflect PEP failure. The eight seroconversions that occurred more than three months after the episode for which PEP was taken probably represent new

exposures for which the individual did not take PEP. The authors correctly conclude that other intervention strategies must be used to supplement PEP among PEP users. Roland *et al.* [4] recently showed, in a population largely of MSM in San Francisco, that a program of “enhanced” risk reduction counseling (5 sessions) in conjunction with PEP following sexual exposure to HV was marginally more effective in reducing unprotected sex acts in the following 12 months than was “standard” risk reduction counseling (2 sessions). Despite this extensive counseling of PEP recipients, their incidence of HIV seroconversion was 2.6% and 2.9% in the enhanced and standard groups, respectively. Both the Amsterdam cohort study and the San Francisco study strongly suggest that it is also reasonable to conclude that the success of PEP depends upon consistently employing PEP following every potential exposure to HIV.

The alternative approach to prevention of HIV infection among MSM is to use pre-exposure prophylaxis (PreP), as demonstrated by Grant *et al.* However, the success of PreP also depends on consistent use and the ability of the individual to correctly anticipate exposure, unless treatment is to be routinely taken without regard to anticipated exposure.

Widespread use of both PEP and PreP will involve considerable expense. While it could be argued that such consistent widespread use would be cheaper in the long run than treating the infections avoided, the costs of these approaches are now, while the savings would be in the future. An important consideration would also be the issue of who should pay for the use of PEP and PreP. Many high-risk individuals are unlikely to have the resources to pay for sustained use of drugs. The following

^aDepartment of Epidemiology, University of California, Los Angeles, Los Angeles, California, and ^bSanta Clara Valley Medical Center, San Jose, California and Stanford University School of Medicine, Stanford, California.

Correspondence to Roger Detels, MD, MS, UCLA School of Public Health, Los Angeles, CA United States.

Tel: +310 206 2837; fax: +310 206 1601; e-mail: detels@ucla.edu

Received: 15 November 2011; accepted: 23 November 2011.

are just “back of the envelope” calculations, but illustrate the real costs of using antiretroviral agents to prevent HIV infection. The current retail price of the most commonly prescribed antiretroviral combination used in studies of PEP and PreP, Truvada (emtricitabine/tenofovir), is about \$40 (US) per tablet, or \$1200 per month. Many participants in both the Amsterdam and the San Francisco PEP cohorts received several 28-day courses of PEP each year. The expense of PreP is astronomical. In the study by Grant *et al.*, the approximate cost of Truvada per participant during the 1.2-year follow-up in the study would be \$16,800. The total retail drug supply cost for this 2500-person trial would have been \$42 million. Therefore, the cost of preventing each of the 28 cases of HIV observed in the 1.2 years of the PreP study was \$1.5 million. Is this the wisest use of limited health care resources?

Although resistance to the drug regimen used for PEP in this study was not observed in the 11 seroconverters over the six months of follow-up in this study, it is likely that widespread use of PEP and PreP, if not consistently used, as will likely occur, will ultimately promote the emergence of resistant strains of HIV, as promiscuous use of antibiotics has led to the serious problem of resistant strains of gonorrhea, tuberculosis and malaria. In addition, while modern antiretroviral agents are generally much safer than the drugs available 20 years ago, many physicians have legitimate concerns about the risk/benefit of long-term use of antiretrovirals in asymptomatic HIV-uninfected individuals.

In summary, this paper contributes to the dialogue on treatment as prevention by presenting the realities of the use of PEP by men who continue to have unprotected intercourse and depend on treatment to avoid infection.

Acknowledgements

Conflicts of interest

None declared.

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