Rapid Review #77: February 2014

Rapid Response Service

Gay men's attitudes towards and perceptions of viral load and treatment as prevention

Question

What are gay men's attitudes towards and perceptions of viral load and treatment as prevention?

Key Take-Home Messages

- Findings from recent studies (1-3) have highlighted the potential for antiretroviral therapy to prevent HIV by reducing an HIV-positive person's viral load.
- Prevention experts are concerned that active promotion of "treatment as prevention" may undermine the benefits of widespread antiretroviral use by contributing to treatment optimism and increasing risk behaviours (4).
- The limited number of studies over the past five years suggest that treatment-related beliefs of reduced infectivity could lead to an increase in sexual risk-taking (5;6), particularly among HIV-positive gay men who believed that undetectable viral loads reduced HIV transmission (5).
- Some studies found that HIV-positive gay men who had undetectable viral loads were more likely to engage in unprotected anal intercourse, but other studies did not find the same association (5;7-10). Differences were associated with one's own/partner's HIV status, and type of partnership.
- HIV sero-concordant partners (i.e., both HIV-positive) were more likely than sero-discordant partners (i.e., one partner HIV-positive and one HIV-negative) to discuss viral load when making decisions about whether to engage in unprotected anal intercourse (10).
- The literature highlighted significant differences in sero-discordant partners' understanding of viral load and in their decisions to use condoms (8).

The Issue and Why It's Important

In January 2008, the Swiss Federal Commission on HIV/AIDS declared that HIV-positive individuals in stable sero-discordant relationships (one in which one partner is HIV-positive and the other is HIV-negative) could be considered non-infectious if they adhered to combination antiretroviral therapy, showed an undetectable viral load for at least six months, and were free of co-existing

OHTN

EVIDENCE INTO ACTION

The OHTN Rapid Response Service offers HIV/AIDS programs and services in Ontario quick access to research evidence to help inform decision making, service delivery and advocacy. In response to a question from the field, the Rapid Response Team reviews the scientific and grey literature, consults with experts, and prepares a brief fact sheet summarizing the current evidence and its implications for policy and practice.

Suggested Citation:

Rapid Response Service. *Rapid Response: Gay men's attitudes towards and perceptions of viral load and treatment as prevention.* Toronto, ON: Ontario HIV Treatment Network; February 2014.

Prepared by:

Sanjana Mitra
Jason Globerman

Program Leads / Editors:

Jean Bacon
Sean B. Rourke, PhD

Contact:

rapidresponse@ohtn.on.ca

sexually transmitted infections (11). This statement began a dialogue on the role of antiretroviral therapy in reducing HIV transmission.
Two years later, Cohen et al. (1) published findings from HIV Prevention Trial Network 052 (HPTN 052) the first randomized controlled, multi-country trial to test the efficacy of early antiretroviral therapy (i.e., starting treatment at CD4 550 instead of waiting until CD4 350) as an HIV prevention strategy. The study confirmed outcomes from previous observational studies by demonstrating a decrease in sexual transmission of HIV among heterosexual HIV sero-discordant couples when the HIV-positive partner was on antiretroviral therapy (1).

Following HPTN 052, the concept of "treatment as prevention" gained widespread attention. In this prevention model, administering combination antiretroviral therapy to an HIV-positive individual aims to decrease viral replication and suppress viral load in both blood and genital fluid in order to improve the person's quality of life, and also decrease the risk of HIV transmission (1).

In addition to reducing an individual's viral load, "treatment as prevention" has been discussed for its potential to have population-level effects by decreasing the amount of virus circulating within a community, ultimately decreasing the number of new infections. A study (2) in British Colombia found that between 1996 and 2009, the number of individuals receiving highly active antiretroviral therapy increased from 837 to 5413 and the number of new diagnoses fell from 702 to 338 per year, and concluded that this was due to population-level effects of treatment. The authors also stratified their analysis by injection drug users, showing that between 1999 and 2009, new HIV diagnoses in this population decreased from 159 to 80 (2). These results confirm findings from a previous study which demonstrated reductions in community viral load as a result of highly active antiretroviral treatment decreasing HIV incidence in a cohort of injecting drug users (2). However, a recent study (12) in Alberta, which measured the impact of highly active antiretroviral therapy on community viral load between 2001 and 2010, found that the proportion of people on therapy increased from 62% to 81%, the proportion with undetectable viral load (viral loads less than 50 copies/mL) increased from 32% to 66%, and the proportion with viral suppression (viral loads less than 200 copies/mL) increased from 49% to 72% -- yet annual community viral loads did not vary significantly after 2003 (12). The study also found that newly diagnosed HIV patients, and patients transferring in and out of the region or who were lost-to-follow-up accounted for 38% and 33% respectively of community viral load (12). It is important to note that often these population-level studies do not stratify their analyses by sub-populations such as men who have sex with men.

Nonetheless there are population-level studies of "treatment as prevention" among men who have sex with men, although the effects are difficult to establish. A recent study in San Francisco (3) suggested that increased antiretroviral therapy coverage has stabilized prevalence and decreased incidence of HIV. However, a nationwide study of men who have sex with men in England (13) found that, despite the widespread increase in antiretroviral treatment (from 69% to 80% of people with HIV), neither HIV incidence nor the number of undiagnosed HIV infections changed between 2001 and 2010. In October 2013, Cohen et al published an editorial cautioning the field about the generalizability of the HPTN052 findings to other groups, particularly men who have sex with men (14).

While effective HIV treatment does reduce infectiousness, prevention experts are concerned that the "treatment as prevention" model could undermine the benefit

References

1. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N et al. Prevention of HIV-1 infection with early antiretroviral therapy. The New England Journal of Medicine 2011;365 (6):493-505.
2. Montaner JS, Lima VD, Barrios R, Yip B, Wood E, Kerr T et al. Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: A population-based study. The Lancet 2010;376(9740):532-9.
3. Raymond HF, Chen YH, Ick T, Scheer S, Bernstein K, Liska S et al. A new trend in the HIV epidemic among men who have sex with men, San Francisco, 2004-2011. Journal of Acquired Immune Deficiency Syndromes 2013;62(5):584 -9.
4. Chen Y. Treatment-related optimistic beliefs and risk of HIV transmission: a review of recent findings (2009-2012) in an era of treatment as prevention. Current HIV/AIDS Reports 2013;10(1):79-88.
5. Brennan DJ, Welles SL, Miner MH, Ross MW, Rosser BR. HIV treatment optimism and unsafe anal intercourse among HIV-positive men who have sex with men: findings from the positive connections study. AIDS Education and Prevention 2010;22(2):126-37.
6. Vanable PA, Carey MP, Brown JL, Littlewood RA, Bostwick R, Blair D. What HIV-positive MSM want from sexual risk reduction interventions: findings from a qualitative study. AIDS and Behavior 2012;16 (3):554-63.
7. Joseph HA, Flores SA, Parsons JT, Purcell DW. Beliefs about transmission risk and vulnerability, treatment adherence, and sexual risk behavior among a sample of HIV-positive men who have sex with men. AIDS Care 2010;22(1):29-39.
8. Prestage G, Mao L, Kippax S, Jin F, Hurley M, Grulich A et al. Use of viral load to negotiate condom use among gay men in Sydney, Australia. AIDS and Behavior 2009;13 (4):645-51.
9. Seng R, Rolland M, Beck-Wirth G, Souala F, Deveau C, Delfraissy JF et al. Trends in unsafe sex and

of widespread antiretroviral use by increasing risk taking within high risk populations, such as men who have sex with men (4). They worry that these findings are affecting individuals' perceptions about HIV infectivity and risk of transmission, and may lead some people to engage in risky behaviours such as unprotected anal intercourse (4;14). The way that the "treatment as prevention" messages are being communicated often fail to take into account other factors that affect infectivity, including how difficult it is to consistently adhere to antiretroviral treatment over time (14), the fact that those who regularly adhere to antiretroviral therapy may still experience erratic short term increases in viral load (15), and that people can continue to have higher viral load in genital fluids even when virus levels in the blood are undetectable. (16;17). Furthermore, "treatment as prevention" can lead to "treatment optimism" (4-6), a term used to describe the belief that safe sex is less important because being diagnosed with HIV is less serious nowadays, as a result of improved treatment outcomes that mitigate the impact of the virus. As such, it is important to understand gay men's attitudes towards and perceptions of treatment as prevention and viral load, in addition to considering how "treatment as prevention" research is communicated and therefore impacts gay men's community sexual safety norms.

What We Found

This rapid response summary reviewed three studies on treatment as prevention and four studies on viral load published in the last five years.

Treatment as Prevention

A review by Chen et al (18) on treatment as prevention examined the role of treatment optimism-related beliefs in changing people's sexual risk behaviours. Ten of the 14 studies were with people living with HIV, two were with HIV-negative individuals, and two were with both HIV-positive and HIV-negative individuals. Both quantitative and qualitative studies with varying sample populations largely found an association between optimistic beliefs related to reduced infectivity and risk of HIV transmission (18):

- A study of 346 HIV-positive men who have sex with men on treatment from multiple cities across the United States (5) found that treatment beliefs about the reduced ability to transmit HIV was significantly associated with sexual risk behaviours, particularly among men who believed that low or undetectable viral load reduced transmission risk. Treatment beliefs were also found to be related to race, socio-economic status, alcohol and drug use, and mental health (5).
- A qualitative study of HIV-positive men who have sex with men (6) found only a small group of participants perceived that HIV treatments could reduce infectivity. However, participants described the shifting community norms that led to overall beliefs that undermined the importance of safe sex within the gay community (6).

Another related issue is the difficulty in establishing whether attitudes change behaviours or behaviours change attitudes. For example, a study of 217 HIV-negative men who have sex with men from Amsterdam (19) argued that treatment optimism precedes unprotected anal intercourse. Men who perceived that antiretroviral therapy reduced the threat of HIV were more likely to change behavior and engage in unprotected receptive anal intercourse. Conversely, a

influence of viral load among patients followed since primary HIV infection, 2000-2009. AIDS 2011;25(7):977-88.

10. Van Den Boom W, Stolte IG, Witlox R, Sandfort T, Prins M, Davidovich U. Undetectable viral load and the decision to engage in unprotected anal intercourse among HIV-positive MSM. AIDS and Behavior 2013.

11. Vernazza P, Hirschel B, Bernasconi E, Flepp M. Les personnes seropositives ne souff rant d'aucune autre MST et suivant un traitment antiretroviral effi cie ne transmettent pas le VIH par voie sexuelle. Bulletin des Medecins Suisses 2008;(89):165-9.

12. Krentz HB, Gill MJ. The effect of churn on "community viral load" in a well-defined regional population. Journal of Acquired Immune Deficiency Syndromes 2013 October 1;64(2):190-6.

13. Birrell PJ, Gill ON, Delpech VC, Brown AE, Desai S, Chadborn TR et al. HIV incidence in men who have sex with men in England and Wales 2001-10: a nationwide population study. Lancet Infect Dis 2013 April;13(4):313-8.

14. Cohen MS, Muessig KE, Smith MK, Powers KA, Kashuba AD. Antiviral agents and HIV prevention: controversies, conflicts, and consensus. AIDS 2012 August 24;26(13):1585-98.

15. van SA, Zhang S, Reiss P, Gras L, van der EM, Kroon F et al. Immunologic, virologic, and clinical consequences of episodes of transient viremia during suppressive combination antiretroviral therapy. Journal of Acquired Immune Deficiency Syndromes 2008;48(1):104-8.

16. Barroso PF, Schechter M, Gupta P, Bressan C, Bomfim A, Harrison LH. Adherence to antiretroviral therapy and persistence of HIV RNA in semen. Journal of Acquired Immune Deficiency Syndromes 2003;32(4):435-40.

17. Cu-Uvin S, Caliendo AM, Reinert S, Chang A, Juliano-Remollino C, Flanigan TP et al. Effect of highly active antiretroviral therapy on cervicovaginal HIV-1 RNA. AIDS 2000;14(4):415-21.

18. Chen MY, Bilardi JE, Lee D, Cummings R, Bush M, Fairley CK. Aus-

tralian men who have sex with men prefer rapid oral HIV testing over conventional blood testing for HIV. International Journal of STD & AIDS 2010;21(6):428-30.

19. Stolte IG, Dukers NH, Geskus RB, Coutinho RA, de Wit JB. Homosexual men change to risky sex when perceiving less threat of HIV/AIDS since availability of highly active antiretroviral therapy: a longitudinal study. AIDS 2004 January 23;18 (2):303-9.

20. Huebner DM, Rebchook GM, Kegeles SM. A longitudinal study of the association between treatment optimism and sexual risk behavior in young adult gay and bisexual men. J Acquir Immune Defic Syndr 2004 December 1;37(4):1514-9 Remis RS, Swantee C, Liu J. HIV/AIDS in Ontario: Preliminary Report, 2010. Toronto, Ontario: Ontario HIV Epidemiologic Monitoring Unit; 2012.

longitudinal study that included 538 HIV-negative men from the United States (20) found that treatment optimism did not predict unprotected anal intercourse, but engaging in unprotected anal intercourse did predict later treatment optimism.

Viral Load

The literature reinforces that there is a complex relationship between people's knowledge of viral load and individual decisions to engage in sexual risk behaviours. It also highlight differences in understanding and safe-sex decision-making practices between sero-discordant partners.

- An Australian study (8) explored the association between viral load and unprotected anal intercourse among HIV sero-discordant gay couples and found that HIV-negative men in discordant relationships used the knowledge of their positive partner's viral load to make a decision about whether or not to use a condom during intercourse. In contrast, the HIV-positive men in discordant relationships who had detectable viral loads were as likely as those who had an undetectable viral load to engage in unprotected anal intercourse with their negative partner (8).
- A French study of 670 HIV-positive gay men between 2000 and 2009 (9) also found that people with HIV who had detectable viral load reported sexual risk behaviours as frequently as those with undetectable viral loads. In addition, the study found that sexual risk behaviours increased gradually over time, remaining significant even after adjustment for viral load (9).
- A study of HIV-positive men from the Netherlands (10) found that between partners with the same HIV status, sex buddies were more likely than casual partners to discuss low viral load before engaging in unprotected anal intercourse. However, among sero-discordant partners, there was no difference between sex buddies and casual partners in discussing viral load before engaging in unprotected anal intercourse (10). The study also found that partners with the same HIV status frequently discussed unprotected anal intercourse based on viral load, while serodiscordant partners discussed viral load much less frequently (10). Authors suggested that this may be due to the HIV-positive partner not disclosing his status to the negative partner in order to avoid stigma and discrimination (10).
- An American study of gay men (7) showed that men who believed that low viral load reduces transmission risk were more likely to engage in unprotected sex with sero-discordant casual partners.

Factors That May Impact Local Applicability

All papers included in this summary were published in the last five years and conducted in high income countries with HIV epidemics among gay men similar to that in Canada. The literature on gay men's attitudes and perceptions on treatment as prevention and viral load is recent and, therefore, limited.

What We Did

We searched PsychInfo, Sociological Abstracts, Social Sciences Abstracts, International Bibliography of the Social Sciences (IBSS), Social Sciences Citation Index, ASSIA: Applied Social Sciences Index and Abstracts using a combination

of text terms ((Gay) OR (men who have sex) OR (MSM)) AND (viral load). We also searched Scopus using a combination of text terms ((Gay) OR (men who have sex) OR (MSM)) AND (treatment as prevention). We reviewed references in the studies found. All searches were limited to articles published since 2007 in English.