HIV: Pre-exposure Prophylaxis

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Letter to Editor

DEAR EDITOR

The human immunodeficiency virus (HIV) epidemic is in its third decade and has reached to alarming proportions worldwide.[1] According to the Centers for Disease Control and Prevention (CDC), more than one million people are living with HIV with an estimated 56,300 infections happening each year in the United States.[1] Previous studies show that special preventive program is needed to control an HIV transmission.[2]

Pre exposure prophylaxis (PrEP) is part of comprehensive HIV prevention services, in which HIV-negative people, who are at high risk, take anti-retroviral medication daily to try to lower their chances of becoming infected with HIV if they are exposed to it.[3]

PrEP is an oral prophylaxis for HIV while microbicides are now referred to as "topical" PrEP.[4]

The majority of the anti-retroviral-based formulations are oral tablets containing the active ingredients tenofovir and/or emtricitabine.[5] Raltegravir and maraviroc are two other drugs under trial.[4]

Results of one study (iPrEx study) showed that a once-daily pill containing tenofovir plus emtricitabine was safe and provided an average of 44% additional protection against HIV infection to men and transgender women who have sex with men, who were also provided with a comprehensive package of prevention services.[6] Another study (TDF2 study) found that once-daily tenofovir disproxil fumarate/emtricitabine reduced the risk of acquiring HIV infection by roughly 63% overall in the study population of uninfected heterosexual men and women.[3]

Center for disease control and research (CDC) recommends tenofovir disproxil fumarate (TDF) 300 mg plus emtricitabine (FTC) 200 mg daily.[6] Negative HIV antibody test is documented, immediately before starting PrEP medication.[6] Patient is tested for acute HIV infection if he has symptoms consistent with acute HIV infection.[6] Drugs are prescribed initially for no more than 90-days, renewable only after HIV testing confirms that patient remains HIV-uninfected.[6]

Adverse drug reaction of TDF/FTC

combination includes lactic acidosis and severe hepatomegaly with steatosis, acute renal failure, and fanconi syndrome.[4] Hepatic function should be monitored closely.[4] The combination should not be used if creatinine clearance is <30 mL/min or if patient is on hemodialysis.[4]

At present, research on microbicides is focused on assessing potential anti-retroviral agents for their ability to prevent an HIV infection.[7] Tenofovir's efficacy in suppressing viral replication, long half life and favorable safety profile made it an ideal choice as the first anti-retroviral drug to be formulated as a microbicide gel.[7,8] *In vitro* and *in vivo* assessments of the 1% concentration of tenofovir in a gel formulation have demonstrated its potential as a microbicide.[7,8]

The CAPRISA (Center for the AIDS Program of Research in South Africa) 004 trial, which tested 1% tenofovir gel against placebo, found that acquisition of HIV was reduced by 39% overall in women using the active product and by 54% in highly adherent users.[5,9]

A frequent concern relating to ARV-based prevention methods is the possible development and transmission of resistance in persons who use such methods and are unlucky enough to contract an HIV while on treatment.[5] The risk of development of viral resistance could potentially be reduced by vaginal gel dosing rather than oral tablet dosing.[5] Utilization of microbicides with two or more active ingredients, which target different aspects of the virus life-cycle, may also help in preventing the development of resistance.[5,10]

REFERENCES

1. Kanekar AS. HIV/AIDS counseling skills and strategies: Can testing and counseling curb the epidemic? Int J Prev Med 2011;2:10-4.
2. Shokoohi M, Baneshi MR, Haghdoost AA. Size estimation of groups at high risk of HIV/AIDS using network scale up in Kerman, Iran. Int J Prev Med 2012;3:471-6.
3. Available from: http://www.cdc.gov/hiv/prep/on 11-06-2012. [Last accessed on 2012 June 12].
4. Naswa S, Marfatia YS. Pre-exposure prophylaxis of HIV. Indian J Sex Transm Dis 2011;32:1-8.
5. Ramjee G. Microbicides for HIV prevention. Indian J Med Res 2011;134:930-8.
6. Available from: http://www.cdc.gov/hiv/prep/pdf/PrEPfactsheet.pdf. [Last accessed on 2012 July 17].
7. Abdool Karim SS, Baxter C. Microbicides and their implications in HIV prevention. Indian J Med Res 2010;132:656-9.
8. Rohan LC, Moncla BJ, Kunjara NA, Ayudhya RP, Cost M, Huang Y, *et al*. *In vitro* and *ex vivo* testing of tenofovir shows it is effective as an HIV-1 microbicide. PLoS One 2010;5:e9310.
9. Abdool Karim Q, Abdool Karim SS, Frohlich JA, Grobler AC, Baxter C, Mansoor LE, *et al*. CDPRISP 004 Trial Group. Effectiveness and safety of tenofovir gel, an antiretroviral microbicide, for the prevention of HIV infection in women. Science 2010;329:1168-74.
10. Martinez J, Coplan P, Wainberg MA. Is HIV drug resistance a limiting factor in the development of anti-HIV NNRTI and NRTI-based vaginal microbicide strategies? Antiviral Res 2006;71:343-50.

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