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Abstract

Estimating the public health impact of the effect of HSV suppressive therapy on HIV-1 plasma viral load

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Objectives Trials of herpes simplex virus (HSV) suppressive therapy among HSV-2/HIV-1 infected individuals have reported an impact on plasma HIV-1 viral loads (PVL). Our aim was to estimate the population-level impact of suppressive therapy on female-to-male HIV-1 sexual transmission.

Methods By comparing pre- and post-randomisation individual-level PVL data from two HSV suppressive therapy randomised controlled trials in sub-Saharan Africa, we estimated the effect on duration of HIV-1 asymptomatic infection and number of HIV-1 transmission events for each trial.

Results Assuming that a reduction in PVL is accompanied by an increased duration of HIV-1 asymptomatic infection, 4-6 years of HSV suppressive therapy produce a one year increase in the duration of this stage. To avert one HIV-1 transmission requires 8.8 (95% CI 5.9-14.9) and 11.4 (95% CI 7.8-27.5) women to be treated from half-way through their HIV-1 asymptomatic period, using results from Burkina Faso and South Africa trials respectively. Regardless of the timing of treatment initiation, 51.6 (95% CI 30.4-137.0) and 66.5 (95% CI 36.7-222.6) treatment-years are required to avert one HIV-1 infection. Distributions of set-point PVL values from sub-Saharan African populations suggest that unintended adverse consequences of therapy at the population level (i.e. increased HIV-1 transmission due to increased duration of infection) are unlikely to occur in these settings.

Conclusions HSV suppressive therapy may avert relatively few HIV-1 transmission events per person-year of treatment. Its use as a prevention intervention may be limited; however, further research into its effects on rate of CD4 decline and the impact of higher dosing schedules is warranted.