Effect of highly active antiretroviral therapy on diagnoses of sexually transmitted diseases in people with AIDS

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Summary

Background There has been an increase in high-risk sexual behaviour and sexually transmitted diseases (STD) during the time period when highly active antiretroviral therapy (HAART) became widely available. We examined whether taking HAART increased the risk of acquiring an STD—an epidemiological marker of unsafe sex—in people with AIDS.

Methods We did a computerised match of people in the San Francisco STD and AIDS registries. People with AIDS who were diagnosed before 1999 and alive in November, 1995, or later, were classified as having had an STD after AIDS diagnosis or not having had an STD after AIDS diagnosis. We used a Cox proportional hazards model to see whether use of antiretroviral therapy was associated with acquiring an STD after AIDS, after adjustment for sex, age, race, HIV-1 risk category, and CD4 count at AIDS diagnosis.

Findings People with AIDS who had had HAART showed an independent increase in the risk of developing an STD (hazard ratio 4·10; 95% CI 2·84–5·94). Americans of African origin, younger age, and higher CD4 count at AIDS diagnosis were also associated with acquiring an STD after AIDS. The number of people living with AIDS who acquired an STD increased over time from 60 (0·66%) in 1995 to 113 (1·32%) in 1998 (p<0·001).

Interpretation We have shown that people on HAART are more likely to develop an STD, an epidemiological marker of unsafe sex. More intensive risk-reduction counselling and STD screening for people with AIDS is needed.

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Introduction

The use of highly active antiretroviral therapy (HAART) has substantially lowered morbidity and mortality from HIV-1 infection and has improved the quality of life of HIV-1 infected people.14 These newer treatments have also been effective in decreasing serum and genital fluid concentrations of HIV-1,15 thereby potentially reducing sexual transmission of HIV-1.16,17

Several reports have documented increases in high-risk sexual behaviour and sexually transmitted diseases (STD) with the increased availability of HAART.18–20 There is also evidence that uninfected individuals are less worried about acquiring HIV-1 infection,21–23 and that there has been a decrease in the perceived risk of sexual activity with HIV-1 infected people on HAART.24–26 Additionally, the presence of STDs has been shown to increase genital HIV viral load27 and could affect the resistance pattern of genital HIV-1.28

Non-HIV-1 STDs are epidemiological markers for unprotected sexual activity that may also transmit HIV-1.29 Moreover, presence of an ulcerative or inflammatory STD increases the likelihood of HIV-1 transmission and acquisition.22 We have therefore assessed whether taking HAART increases the risk of acquiring an STD in people with AIDS.

Methods

Selection of participants

AIDS surveillance in San Francisco is done by active and passive reporting, and has been reported to be more than 95% complete.28 We did a computerised match of people in the San Francisco STD and AIDS registries. Adults (13 years or older) who were diagnosed with AIDS before 1999 and were alive in November, 1995, or later (the time that HAART became available) were included.29 The Centers for Disease Control and Prevention, USA, 1993 AIDS case definition was used. The vital status of AIDS cases was mainly established by weekly review of local death certificates and matches yearly with the National Death Index. The date antiretroviral therapy began, type of therapy used, and CD4 test results were recorded from medical records at the time of initial case report and every year thereafter. HAART was defined as use of a protease inhibitor or a non-nucleoside reverse transcriptase inhibitor before an STD diagnosis. People not receiving HAART before an STD diagnosis were classified as having received antiretroviral therapy other than HAART or as having received no antiretroviral therapy before the STD.

We included people who were reported to the San Francisco Department of Public Health with gonorrhea, chlamydia, syphilis (primary, secondary, and early latent), or non-gonococcal urethritis, between Nov 1, 1995, and Dec 31, 1998. California law requires that laboratories and health-care providers report these STDs.

Analyses

People in the STD and AIDS registries who had the same last name, first name, date of birth, and sex were matched by the SAS SQL procedure. The University of California...
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doubling in male rectal gonorrhoea in San Francisco—from 72 cases in 1994, to 158 cases in 1998. The largest outbreak of syphilis in homosexual men in San Francisco since the early 1980s was in 1999.14 The increased risk of STDs among Americans of African origin in our study is consistent with the four to ten times higher rate of STDs seen among Americans of African origin in San Francisco than in white people.15

Younger age was also significantly associated with acquisition of an STD after AIDS, corresponding to reports that young people are less concerned about HIV-1 infection and AIDS.13,14

Our study had several limitations. As with any observational study, causality cannot be assumed. However, we required that development of the STD was after the initiation of HAART. Moreover, our finding that rates of STDs among people with AIDS increased each year despite an overall decrease in STDs in San Francisco strongly suggests that HAART or some other factor associated with HIV/AIDS explains this rise in STDs among people with AIDS. Because most STD diagnoses were in men who have sex with men, our results might not be generalisable to areas in which most AIDS cases are among people in other risk groups. Since some physicians, especially those in the private sector, treat some people empirically without diagnostic testing or reporting, our study probably underestimates STDs in the community. But, since patients treated by private physicians are also most likely to be on HAART (unpublished data), underestimation of STDs among patients in the private sector would diminish the association between diagnosis of an STD and ever having been on HAART. In addition, in 1998, screening practices for chlamydia were changed. Public STD clinics began screening homosexual men without symptoms for chlamydia. To assess whether these changes in screening could have biased our results, we repeated our analysis excluding all chlamydia cases (n=12). Results were unchanged (data not shown).

Unfortunately, we do not know what proportion of sexual partners of people with AIDS are also HIV-1 infected. However, in a multisite study, which included San Francisco, investigators noted that in newly HIV-1 infected homosexual men, most seroconverters reported their most risky sexual activity as unprotected sex with partners of unknown HIV-1 status.15 Moreover, unprotected sex with another HIV-1-positive person could result in superinfection with a drug-resistant strain of the HIV-1 virus.16,17 Finally, STDs themselves cause morbidity, especially among individuals who are immunocompromised, and many studies have shown that having an ulcerative or inflammatory STD increases the likelihood of HIV transmission and acquisition.18

By definition, patients with AIDS receiving HAART know their HIV status and have continuing contact with the health-care system. To enhance HIV-1 prevention, more intensive risk-reduction counselling and routine STD screening for people with AIDS is needed.

Contributors

Susan Scheer contributed to the study conception and design, analysed and interpreted the data, and wrote the paper. Priscilla Chu did the computerised match and contributed to data analysis and drafting of the paper. Jeffrey Klauwesner contributed to interpretation of the data, drafting of the paper, and provided the data from the STD registry. Mitchell Katz contributed to study design, interpretation of the data, and drafting of the paper. Sandra Schwarz contributed to study conception and design, interpretation of data, and drafting of the paper.

References


