Transmissible HIV That Is Resistant to PrEP Is Rare

An analysis of the Seattle area HIV population sought to determine the prevalence of virus resistant to both drugs in Truvada.

March 21, 2018

People living with diagnosed HIV who have virus that is resistant to both of the antiretrovirals (ARVs) included in Truvada (tenofovir disoproxil fumarate/emtricitabine) and who also have a viral load high enough to be significantly transmissible are rarities, aidsmap reports. This finding, from an analysis of the HIV population in King County, Washington, is reassuring in the face of worries about how commonly people adhering well to the daily Truvada as pre-exposure prophylaxis (PrEP) regimen might contract drug-resistant virus.

Over the past two years, there have been a handful of cases of documented PrEP failure, all among men who have sex with men, including three men who contracted drug-resistant strains of HIV (a new case was just reported in King County), one man whose virus might have been drug resistant when he contracted it (a lack of proper, time-sensitive testing renders this impossible to confirm) and another man who had an extraordinarily high number of sexual partners and whose virus was not resistant to the drugs in Truvada.

Researchers from Public Health Seattle (the city is within King County) presented findings from their analysis of drug-resistant virus in the local HIV population in a poster presentation at the 2018 Conference on Retroviruses and Opportunistic Infections (CROI) in Boston. They studied local drug resistance test records from 2003 through 2017. They also conducted four rounds of tests in 2016 and 2017 to determine HIV-positive residents' viral loads.

This study is limited by the fact that it did not account for those living with undiagnosed HIV, who may be major source of transmission of the virus. However, King County has a high diagnosis rate and was the first major U.S. city to hit the so-called 90-90-90 targest, getting 90 percent of its HIV population diagnosed, 90 percent of that group on ARVs and 90 percent of that group virally suppressed.

Of the 6,963 people in King County's database of residents with diagnosed HIV, 3,881 (56 percent) had received testing for drug resistance. A total of 246 (6 percent) had high-level resistance to both tenofovir and emtricitabine, the two drugs in Truvada. According to the last viral load test of those in this database, 310 people (4.5 percent) had a viral load above 10,000, which the

researchers categorized as “substantial” because such virus would be highly transmissible.

Of those whose resistance had been tested, 12 (0.3 percent) had high-level resistance to both drugs in Truvada as well as viral load above 10,000. Accounting for the fact that not everyone in the database received resistance testing, the researchers estimated that perhaps an additional nine had a substantial viral load and potentially PrEP-resistant HIV.

Those with high-level resistance to both drugs in Truvada tended to be older and had lived with diagnosed HIV for longer than those without such resistance.

Eight additional individuals had high-level resistance to both tenofovir and emtricitabine and a viral load between 1,000 and 10,000 (a “moderate” level) at their last test. Thirteen people had a viral load above 10,000 and low-level resistance to the drugs in Truvada. And two people had a moderately high viral load and low-level resistance to the two ARVs.

All of this means that there may be around 60 people living with diagnosed HIV in King County with a viral load above 1,000 and at least some level of resistance to tenofovir and emtricitabine, or 0.9 percent of the HIV population.

The researchers also wanted to determine how many people in King County had contracted a strain of HIV that was already resistant to both drugs in Truvada, as opposed to having developed such drug resistance over time while receiving ARV treatment. Drug-resistant virus tends to be less “fit” and less transmissible. So while there may be a certain amount of drug-resistant virus within a population of people with HIV, whether such virus is actually likely to transmit to others is another matter.

Between 2008 and 2017, 2,323 people in King County were newly diagnosed with HIV; 1,817 (78 percent) of them received drug resistance testing at the time of their diagnosis. Just three (0.17 percent) of those in the group that received such testing contracted virus that was resistant to both emtricitabine and tenofovir.

In short, because HIV that is resistant to both drugs in Truvada is uncommon and because such virus transmits only rarely, PrEP failure due to drug-resistant virus will likely remain rare.

To read the aidsmap article, click here.

To read the conference abstract, click here.
