A New Case of Apparent PrEP Failure Comes With Hazier Details

After a gay man tested HIV positive, a test of his hair indicated he'd adhered well to PrEP—but did he contract a drug-resistant strain?

March 20, 2018 By Benjamin Ryan

The details of the case of a gay man who tested positive for HIV while apparently adhering to the daily Truvada (tenofovir disoproxil fumarate/emtricitabine) as pre-exposure prophylaxis (PrEP) regimen remain hazy because there is insufficient information to determine whether he contracted a strain of the virus that is resistant to the two medications in the tablet, aidsmap reports.

There have been three previous official reports of gay men contracting HIV while apparently adhering well to the PrEP regimen. In two cases, the men contracted rare strains of the virus that were resistant to both tenofovir disoproxil fumarate and emtricitabine, the two drugs in Truvada. In the third case, involving a man in Amsterdam who engaged in condomless intercourse with an extraordinarily high number of casual partners, the virus he contracted was not drug resistant.

A case study about the 34-year-old gay man in North Carolina who is apparently the fourth person in this tally was presented at the 2018 Conference on Retroviruses and Opportunistic Infections (CROI) in Boston.

Additionally, another case of PrEP failure related to drug resistance was just reported in the Seattle area.

The North Carolina man tested negative for HIV in December 2015 and received a prescription for PrEP in February 2016. Going against protocol, the prescriber gave him a year's worth of refills. The man did not return for his scheduled monitoring visits, which are supposed to take place one month after the first Truvada prescription and then every three months thereafter.

The man reported not having had sex with anyone between that particular HIV test and his starting PrEP. Then, in May 2016, he opted to go off Truvada because he felt he was not at risk for the virus. He started taking it again in July of that year. He insists he took the drug daily from there on out.

In March 2017, the man experienced a fever and muscle aches, symptoms that could be indicative of HIV seroconversion illness. He did not receive a test for the virus at this time. He stopped taking

PrEP the following month, in April. That same month, he received an HIV test, which came back positive, meaning that he had probably spent about a month taking Truvada while acutely infected with the virus.

It is unadvisable to take Truvada on its own while infected with HIV because the two drugs in the tablet are insufficient as treatment for the virus; at least one more antiretroviral (ARV) is required to fully suppress HIV. Consequently, the virus may replicate freely enough in the face of Truvada only to adapt such that it becomes resistant to one or both of the ARVs in the tablet.

A blood test indicated that the man had recently been adherent to PrEP. HIV drug resistance tests indicated that his virus had the K65R and M184V mutations, which are known to confer resistance to tenofovir and emtricitabine as well as the mutation K103N, which is associated with resistance to non-nucleoside reverse transcriptase inhibitors such as Sustiva (efavirenz) and Viramune (nevirapine).

The man was given an HIV treatment regimen of Juluca (dolutegravir/rilpivirine) plus Prezcobix (darunavir/cobicistat), although he was taken off the latter tablet in July 2017. (Juluca is the one approved HIV treatment regimen that is effective with only two ARVs instead of the otherwise standard three or more medications.)

Investigators tested the man's hair and found evidence that he had likely taken Truvada daily between January 2017—the furthest back the test could detect—until the point in mid-April when he stopped taking the tablet.

According to the authors of the CROI presentation, it is most likely that in March 2017 the man contracted a strain of HIV that at the very least had the noted NNRTI resistance mutation. Unfortunately, because of the month or so he spent taking Truvada after contracting HIV and the fact that he was not tested for resistance at the point when he became infected, it is not possible to know for certain whether he contracted a strain of the virus that was resistant to tenofovir and emtricitabine or whether his virus developed such resistance after he acquired it because he took Truvada on its own while infected.

Regardless, cases of PrEP failure such as these, experts agree, will likely remain rare. Gilead Sciences estimates that more than 150,000 people are currently taking Truvada for prevention. Abroad, its use is fast escalating in countries such as the United Kingdom and Australia. And yet there have been only this small handful of reported failures.

This particular case in North Carolina, however, illustrates the importance of conducting time-sensitive tests to properly ascertain the details behind presumed PrEP failure cases. It is possible that other similar cases have fallen under the radar because individuals have dropped out of monitoring or clinicians caring for people on Truvada as prevention have not jumped to action to properly document possible cases of PrEP failure. All the PrEP failure case reports this far have come from particularly savvy clinicians and researchers.

To read the aidsmap article, click here.

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