Drug Levels in Hair Predict Treatment Success

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Measuring protease inhibitor (PI) concentrations in hair samples can help predict antiretroviral (ARV) treatment success, according to a study published in the February 20 issue of *AIDS*.

For ARV treatment to be maximally effective, levels of the drugs need to remain high enough in the body to stop HIV replication. A number of factors can cause drug concentrations to fluctuate—including poor adherence (not taking meds correctly), absorption problems in the gut and drug interactions—and ultimately jeopardize the long-term success of treatment.

Therapeutic drug monitoring (TDM), which measures drug concentrations in the blood, is one method to ensure that ARV levels are high enough to effectively treat HIV. However, TDM is an expensive and a time-consuming process that hasn't always proved to consistently predict treatment success. Human hair, however, has been used successfully for some time in forensic science—think *CSI* or *Law & Order*—to measure concentrations of drugs and toxins ingested over a period of days or weeks, and it has proved quite accurate.

To determine whether PI levels in hair correlate with treatment success, Monica Gandhi, MD, MPH, from the University of California in San Francisco, and her colleagues studied samples from 224 HIV-positive women enrolled in the Women's Interagency HIV Study (WIHS). Seventy of the women started taking a regimen including Kaletra (lopinavir plus ritonavir), and 154 began a regimen that included Reyataz (atazanavir). Every six months, the women's viral loads were measured and hair samples, consisting of about 10 to 20 strands, were collected and analyzed.

Gandhi and her colleagues found that PI concentrations in hair samples were highly consistent with treatment success. With Kaletra, the more drug that was present in the hair, the more likely a woman was to have an undetectable viral load. The one third of women who had the highest hair concentrations of Kaletra were almost 40 times more likely to have an undetectable viral load, compared with the one third of women who had the lowest levels of Kaletra in hair. In women taking Reyataz, those with the highest hair concentrations were nearly eight times as likely to have an undetectable viral load.

The technology to measure hair concentrations is relatively easy and inexpensive. Therefore the authors state that it could have many beneficial uses. Not only would it allow health care providers and researchers to help predict treatment responses in their patients and study subjects, but it

could also potentially be used in the developing world as a substitute for expensive viral load tests. Gandhi suggests that providers could take hair samples and then do follow-up viral load tests only in those with low levels of drug in their hair.

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http://beta.docker.poz.com/article/hiv-hair-protease-16228-4003