HIV Levels Before Treatment Can Predict This Immune System Indicator

Researchers may have answered a bedeviling chicken-or-egg question about the persistence of HIV during antiretroviral treatment.

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Researchers may have finally answered a bedeviling chicken-or-egg question about the relationship between the persistence of HIV in the body during antiretroviral (ARV) treatment and the virus-related immune system activation and inflammation that also continues while people are on ARVs. This finding likely adds further weight to the urgency of diagnosing and treating HIV as soon as possible following infection.

HIV hides its genetic material in cells or locations in the body that remain out of reach of ARVs. This result of this overall effect is known as the viral reservoir, the existence of which prevents standard HIV treatment from curing the virus.

Publishing their findings in PLOS Pathogens, researchers from the AIDS Clinical Trials Group (ACTG) studied 101 people with HIV who had plasma and blood-cell samples taken before they started ARVs, one and four years after beginning HIV treatment, and once more between years six and 15 of treatment. All the participants achieved a viral load considered undetectable by standard laboratory measures and maintained this level of viral suppression for an average of seven years, with some doing so for more than a decade.

The participants experienced the steepest decline in measures of HIV's genetic material (detected with highly sensitive tests) during their first four years on ARVs; afterward, they still experienced a decline, albeit at a slower pace.

Looking at the samples taken before the participants started ARVs, the researchers identified a correlation between levels of HIV and indicators of immune system activation and inflammation. However, this association ceased after the individuals started treatment for the virus. More specifically, the low levels of HIV found in the samples taken while people were on ARVs did not seem to influence the levels of immune system activation and inflammation during that time.

The investigators ultimately concluded that the levels of both immune system activation and HIV in the pretreatment samples predicted the levels of persistence of the virus and immune activation seen in the samples taken when the participants were on ARVs.

“Our findings suggest that damage to the immune system that occurs before people are started on [HIV] treatment leads to continued immune activation, even though the medicines are keeping the virus in check,” the study’s lead author, Rajesh Gandhi, MD, of the Massachusetts General Hospital Division of Infectious Diseases, said in a press release. “This suggests that diagnosing HIV and starting antiretroviral therapy as soon as possible may prevent the elevated immune activation that can lead to health problems, such as heart disease. The results also suggest that new strategies focused on reducing immune activation may need to be added to novel interventions designed to reduce and eventually eliminate HIV.”

To read the study, click here.

To read a press release about the study, click here.
