CD4 response to treatment depends on baseline CD4, viral load, and time

Title of publication:
Long-term patterns in CD4 response is determined by an interaction between baseline CD4 cell count, viral load and time: the Asia Pacific HIV Observational Database (APHOD)

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PubMed citation:

What is the problem that led the researchers to conduct this study?
Previous research has demonstrated that CD4 cell counts increase when HIV viral load is completely or partially suppressed after patients start combination antiretroviral therapy (cART). However, it is not clear whether CD4 continues to increase when viral load is suppressed after two to three years of treatment.

Why did the researchers conduct this particular study?
The objective of this paper was to explore how the CD4 cell counts changed over time after starting cART.

Who and what were included in the study?
A total of 1638 patients from the Asia-Pacific HIV Observational Database (APHOD) were included in the study. This database includes two adult cohorts, the Therapeutics Research, Education, and AIDS Training in Asia (TREAT Asia) HIV Observational Database (TAHOD), and the Australian HIV Observational Database (AHOD).

How was the study done?
The study included patients who started cART (defined as three or more antiretroviral drugs) after January 1, 1997, and who had a baseline CD4 cell count and viral load measurement within six months before and up to one month after starting cART.
Changes in CD4 cell count response after starting cART were studied for up to six years of follow-up time. Other factors were also assessed, including age, sex, geographic region, viral load, hepatitis B and C co-infection, prior diagnosis of an AIDS-defining illness, reported mode of HIV exposure, and time on cART.
What did the researchers find?

The researchers found that the long-term CD4 cell count response in these patients was determined by a relationship between baseline CD4 cell count, elevated viral load, and time. Greater increases in average CD4 cell counts were seen among patients who had complete or partial viral load suppression during the follow-up period.

The long-term trends in CD4 cell counts were generally consistent for both the AHOD and TAHOD cohorts. There was a slightly lower average CD4 cell count response in the Asian cohort, which may be due to genetic differences (i.e., Asian vs. primarily Caucasian populations) or variations in antiretroviral drug access and management practices.

What do these research findings mean? How could they impact HIV prevention and/or care and treatment of people living with HIV in Asia?

There are two limitations to this study that should be considered. The first is that patients who did not have as strong CD4 cell count responses may have died and dropped out of the cohort early in their cART. This could result in patients with better CD4 responses being included later in the follow-up period, making it more difficult to directly apply the study results to all patients. The second limitation is that the analysis did not take into account how individual drug changes in the cART regimen could have had an impact on CD4 cell count response.

However, the study does show that having complete or partial viral load suppression over several years of cART leads to greater increases in CD4 count. Since viral load suppression requires consistent adherence to cART, this study emphasizes the importance of adherence to maximize the benefits of cART. There were some regional differences in the results that showed that patients in Asia had poorer CD4 cell count responses, which may be due to less potent cART regimens and/or genetic variations.