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Scientists find more health benefits from starting HIV treatment early

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HIV-infected individuals who begin antiretroviral therapy (ART) soon after acquiring the virus may have stronger immune responses to other pathogens than HIV-infected individuals who begin ART later, a new study from the National Institutes of Health has found. This finding suggests that early initiation of ART may prevent irreversible immune system damage and adds to the body of evidence showing significant health benefits from early ART.

Scientists from the National Institute of Allergy and Infectious Diseases, part of NIH, measured the quantity and qualities of B cells in blood samples taken from three groups of study volunteers: men who had been infected with HIV for fewer than 6 months; men who had been infected with HIV for 6 months or more (often for several years); and men who were not infected with HIV. The HIV-infected men began taking ART for the first time once they entered the study.

B cells make proteins called antibodies that can flag pathogens for destruction by the immune system and prevent them from infecting cells. At the outset of the study, the number of B cells in the blood of both groups of HIV-infected men was significantly lower than the number of B cells in the blood of the uninfected men. Once the two groups of HIV-infected men began ART, however, the numbers of B cells in their blood increased significantly and to similar degrees.

Qualitatively, however, the compositions of B cells in the two groups of HIV-infected men differed notably throughout the study. The

researchers compared the relative proportions of six different types of B cells within and among each of the three groups at the study outset and one year after the HIV-infected men had started ART. The scientists observed that early treatment restored resting memory B cells to the same level as that in HIV-uninfected men, but late treatment did not. Resting memory B cells remember how to make antibodies to a pathogen and can last a lifetime. Also, early ART reduced the proportion of immature B cells to the same level as that in HIV-uninfected men, but late treatment did not. In addition, after one year, the late-treatment group had a significantly greater proportion of so-called exhausted B cells—those that have shut themselves off and resist doing their usual pathogen-fighting activities—compared with the other two groups of participants.

To learn how these differences affected immune system responses to new infections, the research team examined how the two groups of HIV-infected men responded to influenza vaccination at the start of the study and one year after beginning treatment. At the one-year point, a significantly greater proportion of B cells made anti-influenza antibodies in the early treatment group compared with the late treatment group. This suggests that starting ART early in the course of HIV infection enables individuals to fight off other pathogens better than if they start ART later, when the infection has become chronic.

More information: S Moir et al. B cells in early and chronic HIV infection: evidence for preservation of immune function associated with early initiation of antiretroviral therapy. Blood Sept. 13, 2010 (e-pub ahead of print).

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