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Single bNAb infusion can protect monkeys from HIV-like virus infection

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A single antibody infusion can protect monkeys against infection with an HIV-like virus for up to 23 weeks, researchers have found. The study, published in *Nature*, was led by scientists at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and The Rockefeller University.

Previously scientists had found that giving monkeys an infusion of broadly neutralizing antibodies (bNAbs), which target a wide range of HIV strains, a few days prior to exposure to a high dose of virus can prevent infection. However, humans typically are exposed to low doses of HIV on several occasions before becoming infected with the virus. In the current study, the researchers rectally exposed macaques to weekly low doses of simian human immunodeficiency virus (SHIV), which contains components of HIV and a related monkey virus. On average, it took three weeks for detectable levels of virus to appear in the blood of untreated animals.

To investigate whether bNAb infusions could offer long-term protection against SHIV infection, the scientists gave single infusions of one of three individual bNAbs against HIV--known as VRC01, 3BNC117 and 10-1074--to three groups of six macaques, then exposed the animals weekly to low doses of SHIV. In all cases, the bNAb infusions delayed the acquisition of SHIV, with the longest period of protection lasting 23 weeks. The researchers found that the duration of protection depended on the antibody's potency and half-life--a measure of the antibody's lifespan in the blood and tissues.

Next, the investigators tested the ability of a modified version of VRC01 with an extended half-life to protect monkeys from SHIV. Six animals given a single infusion of the modified VRC01 were protected for an average of 14.5 weeks, compared to 8 weeks for those who received the original VRC01 antibody.

Although more research is needed, using bNAb infusions as a prevention strategy potentially could protect people at high risk for HIV transmission, the authors suggest. In this regard, enrollment recently began in the first of two planned human clinical trials assessing VRC01 infusions for preventing HIV infection.

Source:
NIH/National Institute of Allergy and Infectious Diseases
