MedicalXpress

Antibody shields monkeys from HIV-like virus for months

April 27 2016

Just one shot of a lab-produced antibody protected macaques against a sort of monkey HIV for nearly six months, said a study Wednesday into a potential vaccine alternative.

Exposed to simian HIV (SHIV) once a week, non-treated monkeys contracted the virus after just three weeks on average, the researchers said, whereas the trial monkeys remained virus-free for up to 23 weeks.

In human populations at high risk of contracting the AIDS-causing virus, such protection, even temporary, "could have a profound impact on virus transmission," the team of German and US-based researchers reported in the journal *Nature*.

They had examined "passive immunisation" as an alternative to an HIV vaccine, which experts fear may still be years off.

A vaccine works by priming the body to respond with germ-fighting antibodies whenever a virus or bacteria invades. It is long-lasting, sometimes for life.

"Passive immunisation" involves the transfer of antibodies generated by one person directly to another to provide protection, which is shorter-lived.

Antibody shots were used to protect travellers against Hepatitis A until a vaccine became available in the 1990s, and some hope the technique

could stave off millions of HIV infections until a vaccine comes to the market.

Transferred antibodies had previously been shown to protect animals against HIV-like viruses for a day or two, but never as long as in this study.

Proof of concept

Since the outbreak started in the early 1980s, about 71 million people have been infected by HIV, and some 34 million have died, according to UN estimates.

There is no cure, and the only way of dealing with HIV is lifelong reliance on antiretroviral drugs, invented in the 1990s, to stop the virus from replicating.

The treatment carries side effects and is costly.

The quest for a vaccine has been long and frustrating, in spite of hundreds of millions of dollars in funding.

Some of the focus has shifted to antibodies, but this too proved complicated as each HIV antibody tends to target a specific virus strain.

In recent years, researchers have discovered that about 10-30 percent of HIV-infected people have a naturally-present, "broadly-neutralising" (bNAb) type of antibody which targets several strains at once.

Three of these were tested in the new study.

Each delayed infection in macaque monkeys, said the team—the first by up to 12 weeks, the second by 20 weeks, and the third by 23 weeks.

A single antibody shot "was protective against repeated low-dose SHIV infection for several months," the team wrote.

This served as "proof of concept" that periodic antibody shots may be useful as an alternative to vaccination, they said, though further research must confirm that the findings can be replicated in humans.

"When considered in the context of a potential exposure to HIV-1 in regions of the world where HIV-1 is endemic," wrote the team, such an infection barrier "could have a profound impact on virus transmission".

More information: Rajeev Gautam et al, A single injection of anti-HIV-1 antibodies protects against repeated SHIV challenges, *Nature* (2016). DOI: 10.1038/nature17677