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Cautionary Tale: This COVID Vaccine Could Heighten HIV Risk for Some, Scientists Warn

In a letter published in The Lancet, several researchers raised questions about the potential for adenovirus-based vaccines to increase the risk of HIV for some recipients.

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In a letter published in The Lancet, researchers warn that the adenovirus vector technology being used around the world to develop vaccines against SARS-Cov-2 could put populations at risk of developing HIV infections.

The researchers — from the Fred Hutchinson Cancer Research Center in Seattle, the University of California at San Francisco and the National Institute of Allergy and Infectious Diseases — said the use of adenovirus 5 vector (Ad5) vaccines could have a devastating impact on regions in the developing world that are still plagued by high HIV rates. People with pre-existing immunity to adenovirus are most susceptible for contracting HIV, the researchers said.

The Moderna, Pfizer and Sanofi's mRNA-based vaccines are a novelty in vaccine development. But vaccines based on recombinant viruses, such as the Ad5 vaccine being developed by the Chinese firm CanSino, have been underway for more than a dozen years. Ad5 is a human adenovirusvector.

According to Global Data, 38 companies are now developing adenovirus vector vaccines against SARS-Cov-2, or COVID-19.

The Ad5 human adenovirus vector technology was used in several failed efforts to develop a vaccine against HIV. The technology is also employed in vaccines against anthrax and Ebola.

In 2007, two trials of Merck's Ad5 HIV vaccine were cancelled. Rather than provide immunity, the vaccine actually increased the risk of HIV infections.

In 2013, Nature reported, "Overall, people who had received the vaccine were significantly more likely to be infected than those who had received the placebo."

After analyzing the data, the Fred Hutchinson Cancer Research Center estimated that Merck's HIV vaccine raised the HIV risk by 41 percent.

Increased risk of HIV is one of the problems associated with adenovirus-based vaccines, but there are also others.

In June, Clinical Trials reported that COVID vaccines being developed by AstraZeneca, Johnson & Johnson and CanSino were at a disadvantage and could "be tripped up by pre-existing antibodies to the vectors used."

Adenoviruses, often mistaken for flu viruses, are estimated to account for 5% of all respiratory infections in the U.S. During the 2018-2019 flu season there were five major adenovirus outbreakson college campuses. Immunity for adenovirus can last many years, and about 40 percent of Americans already have neutralizing antibodies for the viruses.

AstraZeneca/Oxford and Johnson & Johnson are using vectors that are non-human — a chimpanzee vector and the Ad26 vector respectively. The assumption is that these vaccines have an advantage because recipients would not have preexisting neutralizing antibodies against the vector.

But this seems to be a false hypothesis. Hildegund Ertl at the Wistar Institute estimates that between 10% – 20% of Americans and Europeans have Ad26 neutralizing antibodies, and that in parts of Africa, 90% of the population have the antibodies.

Another issue with the adenovirus-based vaccines? According to Vanderbilt Medical School professor Kathryn Edwards, administering any more than two doses of these vaccines over the course of a lifetime might "generate neutralizing antibodies to attack the vector. If this were to occur, it would greatly increase the risk of triggering an autoimmune illness."

Despite these and other concerns, a COVID adenovirus vaccine is already being developed by AstraZeneca, and is in phase 3 trials. Don't be surprised to see it being rushed through the U.S. Food and Drug Administration in the near future.

We are entering into the new territory of bioengineered viral vector vaccine technology, and we have a long way to go before we fully understand the long-term consequences.

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