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CORONAVIRUS

COVID ‘vaccine failure’ may be more likely if you have a weakened immune system. Why?

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There are three COVID-19 vaccines authorized for emergency use in the U.S.: Pfizer-BioNTech, Moderna and Johnson & Johnson. All three prevent severe disease and death but there are some differences on how each vaccine works. Here's what to know. BY DANIEL A. VARELA | MICHELLE MARCHANTE

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On March 13, Lonnie Gaylor noticed he had a persistent cough that resisted over-the-counter medicine. Two days later, the 71-year-old met virtually with his primary care doctor who recommended he get tested for strep throat.

A couple hours after driving through a hospital testing site in Waxahachie, Texas, just south of Dallas, Gaylor learned he was positive for both strep throat and COVID-19. It was a concerning diagnosis given Gaylor has Type 2 diabetes and a kidney disorder, and was 40 pounds overweight.

Yet, he had been fully vaccinated against COVID-19 for a little over a month.

Still, Gaylor was hospitalized the morning of March 17 after doctors noticed his oxygen levels dropped into the 80s, far from the normal levels of 95 to 100.

“That scared the crud out of me because all I’ve ever heard was you know, people go to the hospital, get on oxygen, then the next thing is the respirator and things don’t look really good,” Gaylor, who coaches the girls golf team at Waxahachie High School and drives the morning school bus route, told McClatchy News. “So, needless to say I was very, very, very concerned.”

“I’m also the same guy who’s had both vaccines for shingles and then had a bad case of [it] from Thanksgiving to Christmas,” Gaylor added.

Experts call Gaylor’s case a “breakthrough infection,” which includes those that occur two weeks or more after completing COVID-19 vaccination. Just under 6,000 cases have been reported in the U.S. as of April 20, mostly among women and those older than 60; 74 of them have died.

The Centers for Disease Control and Prevention says it hasn’t found any “unexpected patterns” tied to patient demographics or specific vaccines among the reported cases, but emerging evidence suggests those who are immunocompromised like Gaylor may face greater risks of coronavirus infection after complete vaccination than those without weakened immune systems.

That’s because studies have found this population, including people with AIDS, cancer and organ transplants, may not respond to vaccines as healthy adults do.

Experts call the phenomenon “vaccine failure” or those who experience it, “vaccine non-responders.”

Patients with conditions that affect their immune systems have a greater than 30% risk of death if they contract COVID-19. This means measures such as mask wearing and physical distancing are just as important as vaccination, especially as the nation continues to grapple with limited vaccine supplies, a scarcity of COVID-19 therapies and high mortality rates among immunocompromised people.

This group was also not included in initial clinical trials for the vaccines. Still, “the risks from not developing a vaccine response are way less than not getting vaccinated at all and getting COVID-19,” Dr. Rishi Goyal, an assistant professor of emergency medicine at the Columbia University Irving Medical Center in New York who’s leading a project on COVID-19 vaccine hesitancy, told McClatchy News.

“Just because you get COVID-19 [after vaccination] doesn’t mean the vaccine failed,” said Goyal, who has seen a few cases of infection after vaccination, three of which occurred in transplant patients. “It’s quite possible that if you hadn’t gotten the vaccine you would have gotten a more severe case of COVID-19, but that’s different from what people believe.”

Goyal’s project is focused on developing public health messaging that encourages vaccination because the more people who refuse to get a shot, the more risks vaccine non-responders face.

“One of the interns at the hospital told me because I had the two vaccines, that probably kept me from getting really, really sick,” Gaylor said. “Even though I got shingles and COVID, if they come out with another vaccine, I’m going to take it.”

ARE IMMUNOCOMPROMISED PEOPLE MORE LIKELY TO GET COVID-19 AFTER VACCINATION?

Studies to date have not tested whether people with immunocompromising conditions are more likely to get infected with the coronavirus after vaccination, but “I think common sense says yes,” Dr. Ghady Haidar, an infectious diseases physician specializing in immunosuppressed populations at the University of Pittsburgh Medical Center, told McClatchy News.

Haidar is the senior author of a new non-peer reviewed study that found that among 67 patients with hematologic malignancies — non-solid tumor cancers in the blood, bone marrow or lymph nodes — 46% did not produce antibodies against COVID-19 about three weeks after vaccination with either the Pfizer or Moderna shots, odds that "are the equivalent of a coin flip," Haidar said.

"It's not nice to have to learn this because you obviously want everyone to have responded [to the vaccine]," Haidar said, "but based on what we know from other vaccines like influenza A and hepatitis B, we know that patients like this don't respond. It was just disappointing to patients that that turned out to be true for these COVID-19 vaccines."

A handful of other studies have similar findings.

A study of 436 transplant patients across the U.S. found that only 17%, or 76 people, developed COVID-19 antibodies three weeks after receiving the Pfizer or Moderna vaccine.

Another paper on about 1,200 patients with Crohn's disease or ulcerative colitis in the U.K. who were taking treatments for their conditions found that just 34% built an immune response to the Pfizer vaccine and 27% after the single-dose AstraZeneca shot, which is not authorized in the U.S.

"But I will also say that breakthrough infections, I think, are much more complex than, 'Do I have antibodies: yes or no,'" Haidar said.

PROTECTION IS NOT JUST ABOUT ANTIBODIES

There are several elements of the immune system that play a role in protection from pathogens aside from antibodies, which naturally decline over time no matter the illness.

B cells and T cells, for example, are immune cells that communicate with each other to kick start a chain reaction of responses when exposed to a virus or bacterium, Haidar said. There are also "memory B cells" that can remember if you've been infected with or vaccinated against a pathogen.

A non-peer reviewed study of 185 people who recovered from COVID-19 found that antibodies started to decline about six to eight months after infection, while T

cells only slightly diminished and B cells grew in number over time. In some other infections, B cell memory is “long-lived,” the study said, “including 60+ years after smallpox vaccination or 90+ years after infection with influenza, another respiratory virus like SARS-CoV-2.”

However, studies haven’t tested the status of these B and T cells in immunocompromised people. Haidar said he would expect antibodies to diminish either at similar levels in this group or at an accelerated rate: “But we have to see.”

Another unknown: whether vaccine non-responders still gain partial protection that could “soften the blow” of COVID-19, like with the flu.

Although patients who undergo organ transplants, for example, may not fully respond to influenza vaccines, standard practice is to still recommend annual vaccination against the virus because studies show they benefit from partial protection.

It’s also difficult to quantify the degree of immunosuppression in people with different conditions, Haidar said, so research will need to be specifically designed to understand the risks of “vaccine failure” in varying forms of immune abnormalities.

This is why Haidar recommends immunocompromised patients avoid getting an antibody test, which is a common approach for this group and other vaccines such as for hepatitis B.

“Please, please try not to get your antibodies tested if you are immunocompromised,” Haidar said. “Whether or not you make antibodies, please consider yourselves still somewhat at risk for COVID-19 and continue precautions.”

The amount of virus people are exposed to, the variant they became infected with and the timing of treatments may play a role in vaccine responses, as well, he added.

TREATMENTS MAY AFFECT COVID-19 VACCINE RESPONSES

People with immunosuppressive conditions are also likely being treated with drugs that make their immune systems even weaker.

For example, people with rheumatoid arthritis, multiple sclerosis and other autoimmune diseases commonly receive treatment with anti-CD20 monoclonal antibodies, which ironically destroy cells that make antibodies.

The American Society of Hematology says if a patient and their doctor decide coronavirus vaccination is safe for them, shots should be received at least two to four weeks before receiving immunosuppressive therapy or transplant. And if a patient is already on treatment, the group says to consider waiting six months after therapy has been completed "to increase the likelihood of developing immunity."

COULD BOOSTER SHOTS OR THIRD DOSES HELP IMMUNOCOMPROMISED PEOPLE?

Vaccine developers are testing whether a third dose or booster shot could increase protection against COVID-19, especially against the more contagious coronavirus variants.

The CDC does not currently recommend additional doses, citing a lack of information on "the need for and timing of COVID-19 boosters," but immunocompromised patients are interested, Haidar said. "Our stance thus far is that this is not something we are offering and this isn't something that's being recommended."

The decision stems from the unknowns. "It's difficult to navigate in a data free zone when it comes to this, which is frustrating for both patient and physician," Haidar said.

Thankfully for Gaylor, the COVID-19 vaccine may not have only saved his life, but it also inspired him to pursue a healthier lifestyle.

"My commitment is that I'm going to get my diabetes under control and start trying to do more healthy things," he said, so he can continue to play golf, chase his three grandkids and coach high school sports.

In one month, he's lost 28 pounds and significantly lowered his blood sugar. "I feel just as good as I did a year ago. ... I'm back at full force."

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