Risk Of Allergic Reaction To mRNA COVID-19 Vaccines ‘Extremely Low’

In a new study, researchers have found that the incidence of allergic reactions in people who had received an mRNA COVID-19 vaccine is “extremely low.”

The study, published as a research letter in the journal JAMA, provides further evidence of the overall safety of mRNA vaccines.

**mRNA vaccines**

While mRNA vaccines have been in development for decades, recent technological breakthroughs have enabled them to be at the forefront of the vaccine response to the COVID-19 pandemic.

Conventional vaccines work by delivering a weakened or inactivated virus through purified signature proteins of the virus. The person’s immune system learns to respond, gaining the ability to respond to stronger, active versions of the virus in the future.

But mRNA vaccines work differently. A healthcare professional administers the genetic material of the virus, and viral proteins are created in the person's body. Their immune system then responds to these proteins and learns what to do if it encounters the full version of the pathogen in the future.

One advantage of mRNA vaccines is that there is no risk of an inactivated or weakened virus causing health
issues. Additionally, these vaccines appear to be effective in instances when conventional vaccines are not.

They can also be developed more quickly than conventional vaccines because the process of designing, scaling up, and mass-producing mRNA vaccines is simpler — a key advantage in the global effort to prevent the spread of SARS-CoV-2, the virus responsible for COVID-19.

In this sense, the timing of the recent breakthroughs in mRNA vaccine technology could not have been better.

**Vaccine hesitancy**

However, this new technology, which has received emergency use authorization from the Food and Drug Administration (FDA), has been met with hesitancy in some communities.

This hesitancy is particularly common among Black people and is linked with systemic racism in healthcare contexts. Black people have historically been subjected to unethical clinical experimentation.

One area of concern is the potential for allergic reactions, including anaphylaxis, a severe reaction that affects many areas of the body.

Although researchers have found the vaccines to be safe in clinical trials, dispelling anxieties about their safety is still important.

According to the lead author of the present research, Dr. Kimberly Blumenthal, co-director of the Clinical Epidemiology Program at Massachusetts General Hospital’s Division of Rheumatology, Allergy, and Immunology, “The COVID-19 mRNA vaccines are the first vaccines of their kind, and they have remarkable efficacy and safety across all populations.”

“It is critical to have accurate information on allergic reactions to these vaccines, not only for our current situation but also because this new vaccine platform is so important for future pandemic responses.”

**More than 50,000 participants**

In their study, Dr. Blumenthal and colleagues looked at the rates of allergic reactions and anaphylaxis in a group of employees at the Mass General Brigham hospital, in Boston.

In total, 52,805 participants responded to a symptom survey following their first dose of an mRNA COVID-19 vaccine. The surveys were conducted via text, email, phone calls, and smartphone applications over the 3 days following each vaccination.

The team used the health records of the employees to identify anaphylaxis.

**‘Extremely low’ reactions**

The researchers found that 2.1%, or 1,365, of the employees had experienced an acute allergic
reaction and that 0.025%, or 16, had experienced anaphylaxis.

None had experienced anaphylactic shock, a potentially life threatening complication of anaphylaxis, or required endotracheal intubation.

This rate of anaphylaxis is higher than that estimated by the Centers for Disease Control and Prevention (CDC), which was 11.1 cases per million doses of the Pfizer-BioNTech vaccine and 2.5 cases per million doses of the Moderna vaccine. However, the researchers emphasize that the rate they found was still “extremely low.”

As Dr. Blumenthal notes, “To put this in perspective, this is largely comparable to anaphylactic reactions from common antibiotics.”

The researchers note that their study had some limitations, including the fact that symptoms were self-reported and that the study participants may not be representative of other demographics.

Nonetheless, the findings are further evidence of the overall safety of mRNA vaccines, something particularly important given the high transmissibility and lethality of COVID-19.