Learning to Care for Those in Harm's Way

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For some COVID vaccines, lack of side effects is no cause for concern

Bethesda, Md. – Some recipients of an mRNA COVID-19 vaccine, like those made by Pfizer and Moderna, have experienced a wide variety of side effects, indicating their immune system is revving into gear. However, for those who have not had such reactions, this does not mean the vaccine failed to work as intended, according to a new collaborative study, "Adverse Effects and Antibody Titers in Response to the BNT162b2 mRNA COVID-19 Vaccine in a Prospective Study of Healthcare Workers," published Jan. 14 in Open Forum Infectious Diseases by researchers at the Uniformed Services University of the Health Sciences (USU).

Messenger RNA vaccines, or mRNA-based vaccines, teach the body's cells how to make a protein, or a piece of protein, which triggers an immune response inside the body. Some vaccine recipients have experienced symptoms like body aches and feeling tired, but it has been an ongoing concern whether the vaccine has been effective among those with a lack of symptoms.

The study was conducted by researchers in USU's Infectious Diseases Clinical Research Program in collaboration with the Naval Medical Research Center – Clinical Trials Center – and the Henry M. Jackson Foundation for the Advancement of Military Medicine. The scientists examined 206 hospital employees at Walter Reed National Military Medical Center for antibodies against the coronavirus before and after they received the Pfizer and BioNTech vaccines. The employees had received their vaccines between December of 2020 and January of 2021. They were followed until March of 2021, and had lab work conducted in April and May. Employees were surveyed for vaccine-related reactions at the first monthly clinic visit after each vaccination. As seen in clinical trials, arm pain was the most commonly reported symptom, reported by 91 percent after the first shot and 82 percent after the second. Systemic symptoms, like feeling weak or tired, or having body aches and pains, were reported by 42 percent and 28 percent, respectively, after the first shot. After the second shot, feeling weak or tired, or having body aches and pains, were reported 62 percent and 52 percent, respectively, after the second shot. Ultimately, though, there was no correlation between vaccine symptom severity and antibody levels one month after vaccination.

"Messenger RNA, or mRNA, vaccines play a central role in protecting our U.S. military personnel as well as the general public from COVID-19. Our findings suggest people receiving these vaccines can be reassured that lack of post-vaccination symptoms does not mean that the vaccine is not working as intended," said Dr. Si'Ana Coggins, a scientist in USU's Department of Microbiology and Immunology and the study's lead author. "These results also suggest that it may be possible to design future mRNA vaccines that offer robust antibody responses with fewer vaccine-related symptoms."

The study also found that younger age, lower weight, and female sex were associated with increased vaccine-related adverse effects. Further study is underway to determine whether there are any links between vaccine-related symptoms and longer term antibody responses, in addition to other aspects of vaccine immune response.

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