

The first presentation of COVID-19 two hours after vaccination in a patient with multiple sclerosis: Can COVID vaccine provoke cytokine storm in a patient with asymptomatic COVID-19?

Received: 08 June 2021
Accepted: 14 Aug. 2021

Fereshteh Ghadiri, Mohammad Ali Sahraian, Abdorreza Naser Moghadasi

Multiple Sclerosis Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

Keywords

COVID-19; Vaccination; Multiple Sclerosis; Virology; Rituximab

Vaccination has raised the hope to end this devastating pandemic, especially in patients who need chronic care. Still, there are some concerns about the side effects of the available vaccines that have caused some hesitancy in different groups.^{1,2} Clarifying these adverse events and their mechanisms could help individuals to decide better based on risk and benefit assessment. Here, we present a case that showed symptoms of moderate to severe coronavirus disease (COVID-19) just two hours after vaccination.

The patient was a 34-year-old lady with a twelve-year history of multiple sclerosis (MS). She was on rituximab, and had received her last (ninth)

dose two months earlier. The disease was diagnosed after an attack of right lower extremity weakness. After treatment failure with glatiramer acetate and fingolimod, rituximab was initiated. She got vaccinated by the Sinopharm® COVID-19 vaccine in April 2021. At that time, she did not have any symptoms like fever, cough, body pain, malaise, and gastrointestinal discomfort. She could walk 50 meters without help. Two hours after vaccination, she became febrile. She developed shivering, body pain, nausea and vomiting, diarrhea, and dyspnea.

How to cite this article: Ghadiri F, Sahraian MA, Naser Moghadasi A. The first presentation of COVID-19 two hours after vaccination in a patient with multiple sclerosis: Can COVID vaccine provoke cytokine storm in a patient with asymptomatic COVID-19? *Curr J Neurol* 2021; 20(4): 248-9.

She became unable to walk. She did not have any medical visits until a week later. Her neurologist asked for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) polymerase chain reaction (PCR) that came out to be positive. White blood cell (WBC) counts were 10600 (lymph: 56%). Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels were 80 mm/hour and 110 mg/l, respectively. The blood biochemical profile was reported to be normal. Lung computed tomography (CT) scan showed consolidation in both lungs compatible with COVID-19 (Figure 1). She was advised to be admitted, but she did not accept. She used daily acetaminophen 325 mg, and the symptoms got better.



Figure 1. Chest computed tomography (CT) scan revealed bilateral consolidation

The first scenario that comes to mind is the incidental association of the two events. In fact, substantial caution should be taken to relate them until other cases are reported. Still, one may think of another possible explanation. The impacts of

COVID-19 vaccines on the immune system³ are in line with their efficacy. The question is whether the vaccination could start an immune response that can cause an asymptomatic patient to become symptomatic or not. It has been proposed that COVID-19 has four phases of infection, viral replication, inflammatory, and in some hyperinflammatory.⁴ It is believed that the inflammatory stages are important to be diagnosed early as they could cause irreversible severe end-organ failure.⁴ COVID-19 vaccines are all made based on viral antigens (genetic material that codes these antigens, inactivated viruses containing antigens, and protein-based vaccines presented directly or by a safe vector).⁵ These antigens, in any form, induce an immune reaction. Memory cells formed in the vaccine response pathway could boost immunologic response to the real virus that can lead to early detection and defense responses. We think that apart from coincidence, there may be a possibility that hypersensitivity immune reaction to the vaccine in the first hours after injection could have led to an exaggerated inflammatory phase of COVID-19. However, this is only a hypothesis that cannot be proved until more similar cases are reported.

In conclusion, it can be noted that everyone who want to be vaccinated, should be precisely monitored for the possibility of suffering from COVID-19. It is possible that vaccination in infected people provokes hyperinflammatory reaction and facilitates cytokine storm. This condition can be harmful and even fatal.

Conflict of Interests

The authors declare no conflict of interest in this study.

Acknowledgments

None.

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