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Transient Global Amnesia Following COVID-19 Vaccination: A Case Report

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Abstract

The roles of the nervous system in the aftermath of COVID-19 vaccination is currently being studied more thoroughly. Here, we present a case of transient global amnesia (TGA) that occurred in a 44-year-old male shortly after receiving the Pfizer COVID-19 vaccine. The patient experienced sudden and profound anterograde amnesia with no associated focal neurological deficits. His symptoms included seizures that lasted for less than 24-hours post-vaccination. His test results, including chest X-ray, EEG, and a brain MRI, were negative. We aim to investigate the potential link between the vaccination and development of TGA by providing a case description with documented clinical presentations and diagnostic workup in order to establish any temporal association between the COVID-19 vaccination and the onset of TGA, including the vaccine type, and the time elapsed between vaccination and the symptoms onset. This case contributes to the emerging understanding of potential neurological events following COVID-19 vaccination. It underscores the importance of close monitoring for unusual post-vaccination symptoms and encourages further investigations into the mechanisms underlying TGA post-vaccination. Timely diagnosis and supportive care were crucial in the patient's recovery.

Keywords: COVID-19, Pfizer Vaccine, Transient Global Amnesia (TGA), Side Effects



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Case Report

A 44-year-old assistant professor of internal medicine working in Saudi Arabia was in good health. He stated that he received a second dose of the Pfizer COVID-19 vaccine approximately 10 hours before being admitted to the emergency room (ER). He claimed that after receiving the vaccine a significant amount of time earlier, he experienced nausea and fever, with a subsequent fall that injured his forehead. Unfortunately, he was unable to recall the incident. This was accompanied by profound disruption of his anterograde memory. He was disoriented, repeatedly asking where he was and why he was there. Notably, the first vaccination he received was the AstraZeneca vaccine, given six months prior to his admission without significant adverse effects. After receiving the vaccination at noon, the patient felt well, returned home, and remained alert until 4:00 pm. After developing a fever, he took 500 mg of oral paracetamol. Later, around 9:00 pm, a relative informed him that he was disoriented and had asked for directions while expecting to vomit but had not. After he returned from the bathroom, someone spotted him standing still, with fixed eyes and not responding to the

relative's commands. He later fell to the ground, hitting his head on the floor, and started having seizures. He lost consciousness after discovering a cut on the lateral border of his right eyebrow. He quickly regained consciousness, but was in a state of confusion with no recollection of the events that transpired.

Hospital Course

He was transported to the ER by ambulance, where he was unable to recall what had occurred. He repeated words and had a Glasgow Coma Scale (GCS) score of 14. His physical examination and neurological evaluation were normal. Initial tests revealed normal kidney function, electrolytes, blood sugar, liver function, cardiac enzymes, chest X-ray (Figure 1), and brain CT and MRI scans (Figures 2 and 3). His complete blood count (CBC) showed lymphopenia at 4%, platelets at $187 \times 10^3/\mu\text{L}$, and normal hemoglobin at 15 g/dL, with a white blood cell (WBC) count of $8,280 \times 10^3/\mu\text{L}$. His brain MRI, performed 24 hours after admission, was normal with the exception of mucosal thickening and hypertrophied turbinates, indicating sinusitis (Figure 2).

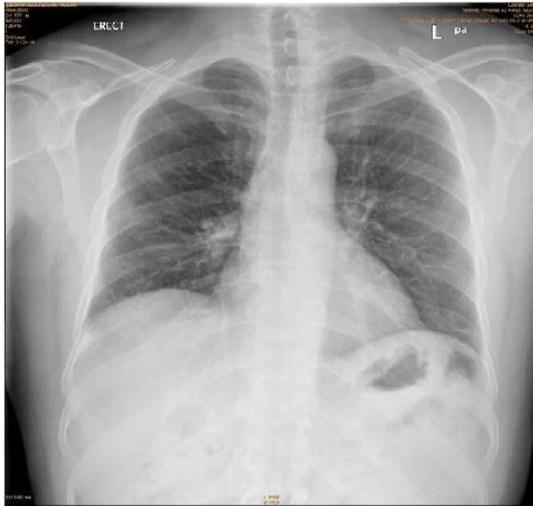


Figure 1: Patient chest X-ray

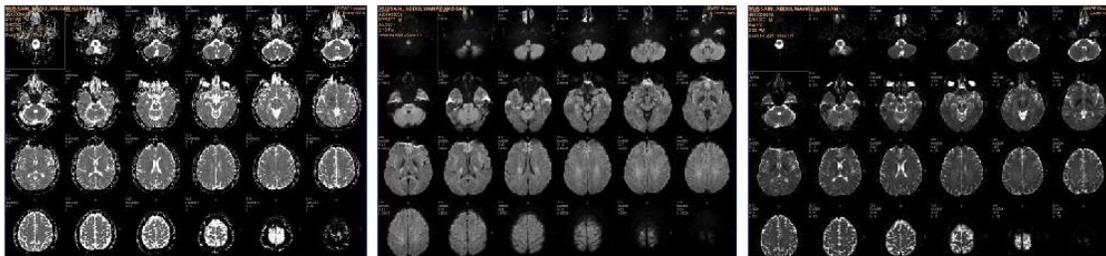


Figure 2: Patient brain MRI

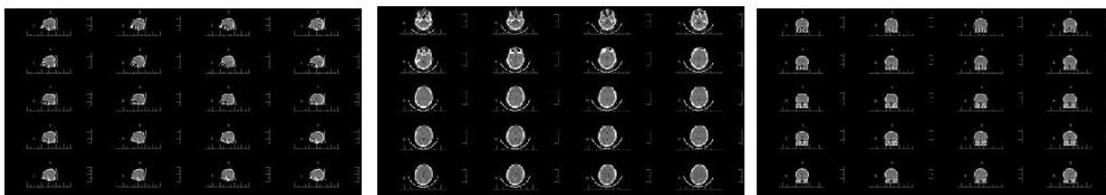


Figure 3: Patient CT brain

The electroencephalogram (EEG) was typical. On the second day, a follow-up CBC showed that the lymphocyte count had increased to normal (26%), with relative monocytosis (17%). He was healthy upon admission, had no seizures, and was given diazepam and intravenous fluids. About two days following hospitalization, the patient gradually retrieved his memory, both recent and old, and was physically free upon discharge. Three days after discharge, full recovery of his memory was noted. Transient global amnesia (TGA) and post-COVID-19 vaccination syndrome (PCVS) was identified.

Discussion

TGA is a clinical illness defined as the abrupt development of anterograde amnesia (the inability to form new memories) (1). Similar to what has occurred in our case, individuals with TGA usually ask repeated questions that reflect their bewilderment and may experience varying degrees of retrograde amnesia (the inability to recall general or personal knowledge) during the episode. Some cognitive processes are normal during a TGA episode. The episodes are self-contained and, by definition, end after 24 hours, with memory function returning and the symptoms

of the episode resolved. A small percentage of people have a few recurrent episodes; however, this did not happen in our case (2).

The gentleman received the Pfizer vaccine prior to the incident. The AstraZeneca vaccine was administered as the first dose six months earlier. In Saudi Arabia, COVID-19 vaccination was implemented earlier by the Ministry of Health. The US Food and Drug Administration (FDA) most recently gave the Pfizer/BioNTech and Moderna COVID-19 vaccines emergency permission on December 11, 2020, and December 18, 2020, respectively. These two COVID-19 vaccines were immediately created to halt the increase in SARS-CoV-2 cases (3). These vaccines contain messenger RNA (mRNA) encoding the spike protein from the original (ancestral) strain of SARS-CoV-2, which causes COVID-19, as well as from the B.1.1.529 (Omicron) variants BA.4 and BA.5 (4).

Following administration of the Pfizer vaccine, only minor effects were felt. The patient developed a fever four hours later and took paracetamol to relieve his symptoms. The majority of COVID-19 vaccine-related adverse events are minor and transient. They generally include headaches, muscle pain, chills, diarrhea, and soreness at the injection site. However, serious but rare complications such as neurological events, myocarditis, anaphylaxis, vesiculobullous skin, acute kidney injury, intravascular thrombosis, and thrombocytopenia may also occur. The majority of mild adverse responses can be managed with acetaminophen, rest, and nonalcoholic fluid intake (5).

Following various types of COVID-19 vaccination, there is a higher than predicted incidence of serious neurological side effects, such as cerebral sinus venous thrombosis, Bell's palsy, transverse myelitis, and Guillain-Barre syndromes, in addition to other typical side effects (6). A few hours following the fever, our patient felt nausea, experienced seizures, and fell to the ground, fainting. However, he regained his consciousness immediately but was unable to recall his memory of all these events, which led his ICU admission. Post-vaccination events that pose substantial risk to life, necessitates hospitalization, or leaves the patient severely disabled are referred to as severe or serious adverse reaction following immunization. Seizures, syncope, encephalitis, Bell's palsy, and stroke are among the major neurological adverse effects that the World Health Organization (WHO) specifies (7).

Although a broad spectrum of cerebral vascular events have been recorded in other studies, we are unsure of the underlying pathological condition that occurred in the patient's neurological system that caused the TGA. Vaccine-induced thrombotic thrombocytopenia (VITT), which usually develops between 5 to 30 days post-vaccination and is extremely severe, frequently coexists with these events. The clinical profile resembles thrombocytopenia brought on by heparin (8). A rare report of ischemic stroke following COVID-19 vaccination often occurs in the context of VITT (9). Slight headaches were our patient's first side

effect after his vaccination. In contrast, there have been reports of a specific focal neurological condition in those who received the Chinese vaccine, CoronaVac, but not the AstraZeneca vaccine. This appears a few days after receiving the first dose of the vaccine and manifests as momentary hemisensory or hemimotor abnormalities, occasionally accompanied by visual phenomena in the corresponding hemifield of vision. There are frequently hemicranial or holocranial headaches present. All patients had normal test results for magnetic resonance (MR) angiography and diffusion-weighted MRI brain scans. However, SPECT tests showed hypoperfusion in the opposite hemisphere during the acute phase, followed by hyperperfusion and the disappearance of symptoms. This has been compared to "cortical spreading depression", a condition that affects those who suffer from migraines with aura.

Theoretical explanations for the causes of this condition include stress connected to vaccinations and an immunological response to the vaccine (10). Normal EEG was reported in this case. However, with the Moderna vaccination, negative EEG and neuroimaging findings in elderly adults, including generalized slowness, poor attention, and disorientation have been reported. Triphasic waves or a nonconvulsive state may also be visible on the EEG. Other delirium-related test results were negative. A young man with high cerebrospinal fluid (CSF) protein levels who received immunization from Al-Mashdali was also found to have steroid-responsive encephalopathy (11).

In this case, seizures were recorded along with normal MRI, CT chest X-ray, and EEG findings, and he had no previous notable medical history (1-3). There are case reports of patients who developed seizures for the first time after receiving the COVID vaccine, however, MRI revealed no acute abnormalities, no prior brain injuries, and no other causes of acute symptomatic seizures. From focal seizures with reduced consciousness to bilateral tonic-clonic seizures and status epilepticus, seizure semiology can take many different forms (12).

Conclusion

To the best of our knowledge, this is the first case report of TGA following COVID-19 vaccination in Saudi Arabia. Evidence indicates that attention should be paid to the pathological causes of this phenomenon. TGA should be considered in patients who received COVID-19 vaccination, even if the symptoms are mild and nonspecific.

Informed consent

Prior to the study, the patient gave written, informed consent.

Competing interests

Regarding the research, writing, and/or publication of this work, the authors declare that there are no potential conflicts of interest.

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