



Could Sinopharm COVID-19 Vaccine Cause Autoimmune Encephalitis? A Case Report

Abdullah Abu-Riash¹, MD, Ahmad Ben Tareef^{*,2}, MD, FCAI, Abdulrahim Aldwairy³, MD

1,2. Anesthesia and intensive care specialist, Jordanian Royal Medical Services.

3: Neurology consultant, Jordanian Royal Medical Services.

Corresponding Author: Ahmad Ben Tareef, MD, FCAI, Anesthesia and intensive care specialist, Jordanian Royal Medical Services.

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Received Date: November 23, 2021

Published Date: December 01, 2021

Abstract

The Sinopharm vaccine was produced by Beijing Bio-Institute of Biological Products company limited (BBIBP-CorV), a subsidiary of China National Biotec Group (CNBG) in 2020 as prophylaxis against coronavirus disease-2019 (COVID-19). To the best of our knowledge, the reported adverse effects of the Sinopharm COVID-19 vaccine in literature were minor and non-serious so far. In this report, we present a case in which the vaccine could be the cause of autoimmune encephalitis. A detailed history was taken from the patient's family, in addition to, a close follow-up for clinical, laboratory and imaging studies during his stay in the hospital. Furthermore, written consent, to conduct and publish this study, was taken from the patient's family.

Key Words: Sinopharm, BBIBP-CorV, Autoimmune Encephalitis, AIE, Convulsions, Seizures, Status Epilepticus, Anti-NMDA, Anti-LGI1, Anti-VGKC.

Introduction

The Sinopharm vaccine was produced by Beijing Bio-Institute of Biological Products company limited (BBIBP-CorV), a subsidiary of China National Biotec Group (CNBG) in 2020 as prophylaxis against coronavirus disease-2019 (COVID-19) [1]. It was developed by β -propiolactone mediated inactivation of one Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) strain, the 19nCoV-CDC-Tan-HB02 strain [2]. So far and to the best of our knowledge, literature has shown mild to moderate adverse effects following Sinopharm vaccination, such as; injection site pain, fatigue, headache and fever, with an overall good safety profile [1, 2, 3, 4, 5, 6, 7, 8].

In this report, we present a case of autoimmune encephalitis (AIE) that could be a direct result of Sinopharm vaccination. Autoimmune encephalitis is a disorder in which the body produces antibodies that attack and damage the neuronal cell membrane and synaptic proteins in the central nervous system (CNS) [9]. Two well-known antibodies are causing autoimmune encephalitis, the anti-N-methyl-d-aspartic acid (anti-NMDA) receptor antibody and the anti-leucine-rich, glioma-inactivated 1 (anti-LGI1), voltage-gated potassium channel (VGKC) antibody [9]. It is thought that the pathogenesis of this disorder might be related to tumors, paraneoplastic disorders, infections or idiopathic [10], and clinical presentation might include psychiatric symptoms, abnormal movements, cognitive changes and most commonly, seizures [10, 11]. Diagnosis of AIE should be guided by clinical data and it can be supported by serum and CSF antibodies detection, although failure to detect them doesn't rule out AIE [10].

Ethical approval

This study was approved by the local research ethics board at the Jordanian Royal Medical Services institution and written consent, to conduct and publish this study, was taken also from the patient's family.

Case

A 20-year-old man presented to the emergency room (ER) as a case of status epilepticus, although he was not known to have any medical illnesses and no family history of epilepsy or autoimmune disorders. Vital signs were stable and he was afebrile. The convulsions were tonic-clonic in nature, benzodiazepines and phenytoin failed to abort them so sodium thiopental (STP) general anesthesia was administered and the airway was secured by an endotracheal tube. The convulsions were very resistant to the degree that STP infusion was maintained at a rate of 575 mg/ hour, then he was transferred into the intensive care unit (ICU). The history dates back 6 weeks before his presentation to the ER when he received the second dose of Sinopharm COVID 19 vaccine, he developed generalized fatigue and myalgia the next day. A few

days later on, he developed a brief single episode of tonic-clonic convulsion, preceded by hallucinations, and followed by bilateral hand tremor and amnesia for the whole event. At that time a brain magnetic resonance imaging (MRI) was done and it was unremarkable, so the patient was reassured. He received the first Sinopharm vaccine dose three weeks before the second dose but side effects were unremarkable except for vomiting once on the same day of vaccination. The family denied any history of a recent upper respiratory tract infection.

During his ICU stay investigations were done. Initial complete blood counts (CBC) showed lymphocytosis, electrolytes and kidney function tests were normal, Toxicology screen was negative, brain computed tomography (CT) was normal and CSF analysis was unremarkable except for elevated glucose level. Blood, urine and CSF cultures were negative for microorganisms. Broad-spectrum antibiotics and acyclovir were started, in addition to anticonvulsants (phenytoin and levetiracetam). STP coma continued for 36 hours, then the patient was extubated two days later, but he was still agitated, disoriented to time, place and person, and having convulsions from time to time. An electroencephalogram (EEG) study showed brain epileptiform activity and a brain MRI showed changes that are suggestive of autoimmune encephalitis involving the limbic system. Knowing that, antibiotics and antivirals were switched into teicoplanin as prophylaxis and methylprednisolone was started. Subsequently, the patient showed a significant improvement in terms of convulsions control and disorientation, and he was discharged from ICU ten days after admission.

Discussion

This report showed a possible association between the Sinopharm COVID-19 vaccine and autoimmune encephalitis, something that has not been shown previously in the literature, to the best of our knowledge. Xia et al, [3] studied the safety of inactivated vaccines against SARS- COV-2 and didn't demonstrate any serious side effects. Balsam Qubais Saeed et al, [4] studied side effects following Sinopharm COVID-19 vaccination and found that side effects following the first and second vaccine doses were mild, predictable, and no cases needed hospitalization due to adverse effects from the vaccine.

Al Khames Aga et al, [5] studied the safety of different COVID-19 vaccines, one of them was Sinopharm and found that 40% of subjects who received this vaccine didn't have any adverse effects. On the other hand, the other 60% of subjects had only minor local and systemic adverse effects. Almufty et al, [6] studied also the side effects of COVID-19 vaccines, including the Sinopharm vaccine, and found that all the side effects were minor that didn't need further intervention. Furthermore, Abu-Hammad et al, [7] and Hatmal et al [8] didn't report serious side effects among studied Sinopharm vaccine recipients.

Conclusion

Sinopharm COVID-19 vaccine could be associated with autoimmune encephalitis, further larger studies may be needed to confirm that.

Conflict of Interest

No conflict of interest to declare.

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