New onset refractory status epilepticus after BNT162b2 nCoV-19

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Introduction

Coronavirus is a pathogen that caused fatal pneumonia cases in Wuhan province of China in December 2019 [1]. It was declared as a pandemic in March 2020 by the World Health Organization [2]. The disease is a severe acute respiratory syndrome with multi-organ involvement, including the cardiovascular system, musculoskeletal system, gastrointestinal and neurological system. Neurological manifestations may be common in COVID-19 patients [3]. Among these, several autoimmunity-affecting syndromes that may result in encephalitis and new-onset refractory status epilepticus (NORSE) have been described. New-onset refractory status epilepticus (NORSE) is an uncommon clinical entity with a mortality rate of 16-27% in adults and significant long-term neurological sequelae. Approximately 50% of patients with NORSE have an unknown aetiology. There is a lack of consensus regarding the best treatment options available for managing patients with NORSE. However, immediate cessation of seizure activity, early institution of continuous infusion of anaesthetic agents, and immunotherapies can play an important role in reducing morbidity and mortality in NORSE.

In this article, we present a case of refractory status epilepticus (NORSE) that is developed following the BNT162b2 nCoV-19 vaccination.

Case report

A 34-year-old male patient who was working as a healthcare personnel in the operating room had complaints of fatigue, sweating, and subjective fever that had started the day before. He was brought to the emergency service in the period with a total of three seizures in the form of unconsciousness, contractions in the arms and legs, and urinary incontinence while he was on duty in the hospital. 10 mg of diazepam was administered twice and 3000 mg of levetiracetam was administered simultaneously to the patient. The patient with no improvement in his consciousness was intubated. 3 cc/h dormicum infusion was started in the patient whose seizures continued. Since his seizures continued under levetiracetam 3000 mg/day maintenance treatment, valproic acid 1000 mg/day was added and 8 cc/h dormicum infusion was started. Generalized bilateral tonic-clonic seizures that required the addition of topiramate 200 mg/day continued. Propofol was started to stop the refrac-
The COVID-19 virus can settle into the brain by anterograde axonal transport [10]. It can damage the brain tissue by triggering inflammatory cytokines including TNF-α, IL-6, IL-1β, along with prostaglandin E2, nitric oxide, and free radicals [3]. Viral vaccines can cause neuronal hyperexcitability and then seizures by triggering the inflammatory cascade. A healthy young patient who had no previous known disease and no seizures applied in the post-vaccination status picture.

The temporal relationship between the vaccination and seizure was also taken into consideration in the view that vaccination triggered seizures. Furthermore, the occurrence of refractory status epilepticus under multiple antiepileptic therapy and receiving a response with immunotherapy support the relationship between the vaccination and epilepsy. Finally, there is a requirement for more researches to clarify the mechanism in this matter.

**Conclusion**

We considered our patient as a NORSE case observed following the first dose of the BNT162b2 nCoV-19 vaccine. We attribute the development of NORSE to the vaccine since the patient did not have epilepsy before and this picture developed after vaccination. With this case, we reported a rare side effect of the BNT162b2 nCoV-19 vaccine. The patient had recurrent seizures that were resistant to antiepileptic drug therapy and responded dramatically to plasmapheresis. This reflects an underlying autoimmune mechanism in the occurrence of generalized seizures. There is a requirement for more researches to search and analyse the exact mechanism at a more molecular level.

**References**


