

New Onset Focal Seizure Following COVID-19 Vaccination: Case Report

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Abstract

Introduction

As more novel COVID-19 vaccines are being rolled out in a frantic pace globally, any complication that might be related to COVID-19 vaccines should be highlighted, especially since COVID-19 vaccines are relatively new, and side effects may yet to be fully elucidated. We report a case of a healthy 18-year-old male who presented with new onset focal seizures 5 days after receiving 1st dose of Oxford/AstraZeneca COVID-19 vaccine.

Case Presentation

The patient was treated with intravenous phenytoin and oral levetiracetam 250mg twice daily with no further events. There was no documented fever. CT venogram and EEG were unremarkable. MRI brain revealed generalised atrophy including mild bilateral hippocampal atrophy with no evidence of sclerosis. There was no predilection for seizures identified from the patient's history. The patient was discharged the following day on levetiracetam and advised to proceed with the 2nd dose of Oxford/AstraZeneca COVID-19 vaccination in 3 months' time.

Conclusion

Seizures following COVID-19 vaccination have only been reported in a handful of cases. COVID-19 vaccination could lower seizure threshold, or unmask an underlying predisposition for epilepsy. As most COVID-19 vaccines worldwide are given in 2 doses, clinicians should consider maintaining patients on anti-seizure drugs if vaccination was thought to be a provoking factor.

Case

We describe a case of a healthy 18-year-old male who presented with new onset focal seizures 5 days after receiving 1st dose of Oxford/AstraZeneca COVID-19 vaccine. The focal seizures started with tonic posturing of the right hand, which spread to the neck, followed by a generalized tonic clonic seizure lasting 1 minute. Two more attacks with identical semiology occurred during the subsequent 3 days with involvement of the right hand at onset, followed by focal to bilateral tonic-clonic seizures. The brief but recurrent events led to hospital admission on day 9 post COVID-19 vaccination.

The patient was loaded with intravenous phenytoin, followed by oral levetiracetam 250mg twice daily with no further in-hospital events. There was no documented fever. CT venogram did not show cerebral venous sinus thrombosis. Routine scalp EEG was unremarkable. MRI brain revealed generalised atrophy including mild bilateral hippocampal atrophy with no evidence of sclerosis (figure 1). There was no predilection for seizures identified from the patient's history.

The patient was discharged the following day on levetiracetam and advised to proceed with the 2nd dose of Oxford/AstraZeneca COVID-19 vaccination in 3 months' time.

Discussion

Vaccination is a trigger for febrile seizures in the paediatric population (1). With long term follow up, 65% of children who developed seizures around the time of vaccination were found to have an underlying genetic or structural cause (2). In our case, although there was no conclusive evidence of an underlying cause, non-specific brain and hippocampal atrophy may herald a predisposition for epilepsy.

COVID-19 infection can cause neurological sequelae including anosmia, Guillain-Barré syndrome, strokes, seizures, and encephalopathy (3). Serious neurological complications following COVID-19 vaccination are rare, such as transverse myelitis, acute disseminated encephalomyelitis, stroke and bell's palsy, whether these events are coincidental or consequential remains unclear (4). Furthermore, the cause-and-effect relationship between COVID-19 vaccination and neurological complications in selected patient populations is even harder to determine. For example, Ghosh et al reported a case of a 68-year-old healthy man with new-onset focal non-motor seizure 4 days after receiving the Covishield vaccine. MRI of his brain revealed non-specific leukoaraiosis. Whether the focal seizure was a mere coincidence is uncertain (5). Separately, a 23-year-old nurse who was seizure-free for 1 year developed breakthrough seizures 10-15 minutes after receiving the Covishield vaccine. Again, whether seizure occurrence soon after vaccination implied causality remains doubtful (6). As the most commonly used COVID-19 vaccines worldwide are given in 2 doses, clinicians should consider maintaining patients on anti-seizure drugs if vaccination was thought to be a provoking factor.

Based on current International League Against Epilepsy stand is there is no evidence having epilepsy is associated with higher risk of side effects from COVID-19 vaccination (7). Indeed, protection conferred from vaccination far outweighs the risk of side effects from the vaccine. Mass COVID-19 vaccination is touted as the way forward to combat the COVID-19 pandemic. Despite concerns raised regarding the safety of COVID-19 vaccines, the incidence of adverse events overall is very low and should not deter the public from getting vaccinated.

Declarations

Funding:

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Conflicts of interest:

On behalf of all authors, the corresponding author states that there is no conflict of interest

Availability of data and material:

Data available on request

Code availability:

Not applicable

Ethics approval:

Not applicable

Consent to participate:

Written informed consent was obtained from all individual participants included in the study

Consent for publication:

Written informed consent was obtained from all individual participants included in the study

Authors' contributions

Chun Seng Phua: Drafting/revision of the manuscript for content, including medical writing for content; Major role in the acquisition of data

Shalini Bhaskar: Drafting/revision of the manuscript for content

Azman Ali Raymond: Drafting/revision of the manuscript for content

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Figures

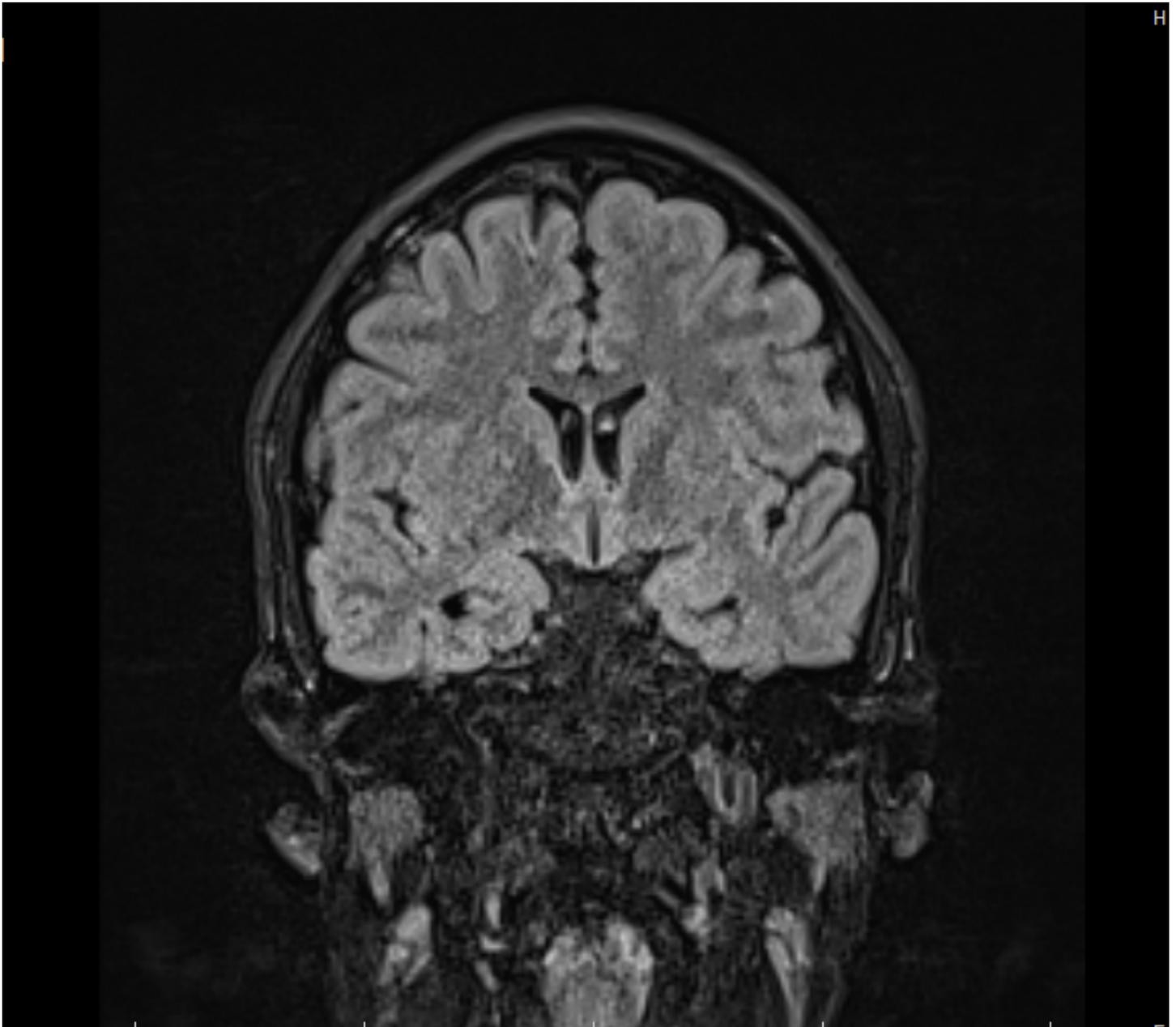


Figure 1

MRI brain coronal view showing generalised atrophy including mild bilateral hippocampal atrophy with no evidence of sclerosis

Supplementary Files

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- [CAREchecklistcomplete.pdf](#)