

# Neurological Side Effects of SARS-CoV-2 Vaccinations are Not Uncommon but Frequently Ignored [Letter]

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## Dear editor

We read with interest the article by Assiri et al about a retrospective study of 18 patients experiencing neurological complications after SARS-CoV-2 vaccinations.<sup>1</sup> Eight patients experienced ischemic stroke, 3 venous sinus thrombosis (VST), with intracerebral hemorrhage in 2 of them, three seizures, two optic neuritis, and two Guillain-Barre syndrome (GBS).<sup>1</sup> It was concluded that neurological complications of SARS-CoV-2 vaccinations are very rare and that neurological complications are due to hypercoagulability triggered by the inflammatory condition.<sup>1</sup> The study is attractive but raises concerns that should be discussed.

We disagree with the statement “neurological sequelae after COVID-19 vaccination are rare”.<sup>1</sup> Statements about the frequency are not possible because the 18 patients were not compared with those of the same region who were also vaccinated but did not experience neurological side effects. Furthermore, headache is a neurological abnormality and frequent on self-reporting platforms to which vaccinees report their side effects from SARS-CoV-2 vaccinations.<sup>2</sup> Myalgia is a neurological abnormality as well and frequently reported as a post-vaccination complication on real world data platforms.

We also disagree with the statement that all neurological side effects after COVID-19 vaccinations are due to hypercoagulability. Guillain-Barre syndrome (GBS) or Miller-Fisher syndrome (MFS) are definitively not due to hypercoagulability. Vascular complications may be due to coagulopathy but conditions such as encephalitis, acute, disseminated encephalomyelitis (ADEM), transverse myelitis, or acute, hemorrhagic, necrotising encephalitis (AHNE) definitively not.

SARS-CoV-2 infections and vaccinations may not only be complicated by hypercoagulability but also by hypocoagulability due to either dysfunctional thrombocytes or immune thrombocytopenia.<sup>3</sup> Therefore, bleeding can be a complication of the vaccination.

In patients 9 and 10 SARS-CoV-2 vaccination associated optic neuritis was diagnosed.<sup>1</sup> Both patients recovered within 10d after onset.<sup>1</sup> We should know how optic neuritis was diagnosed and if both patients underwent cerebrospinal fluid (CSF) investigations and cerebral MRI to exclude multiple sclerosis. Newly onset or flares of multiple sclerosis have been previously reported as a complication of SARS-CoV-2 vaccinations.<sup>4</sup>

Patient 11 had an EF of 42%.<sup>1</sup> Reduced systolic function respectively heart failure are risk factors of ischemic stroke. We should know if the proBNP values of this patient were elevated on admission. Additional risks factors for cerebrovascular disease in this patient were smoking, arterial hypertension hyperlipidemia and diabetes.<sup>1</sup> The HbA1c value was 10.3 on admission. Therefore, a causal relation between stroke and the vaccination is rather unlikely.

Patient 13 was on a previous medication with warfarin.<sup>1</sup> We should know the indication for warfarin and why nonetheless an ischemic stroke developed. Did the patient have atrial fibrillation?

Seizure is a neurological symptom and an underlying cause can be detected in the majority of cases. Patient 16 developed a seizure 16 days after vaccination.<sup>1</sup> The 80yo female had a history of epilepsy, arterial hypertension, and diabetes.<sup>1</sup> Because epilepsy becomes more prevalent with ageing, the occurrence of the seizure can be simply a consequence of advanced age and the relation to the BPV simply a coincidence. Epilepsy is also more prevalent in patients with comorbidities.<sup>5</sup>

Patient 18 was diagnosed with Miller-Fisher syndrome but had developed dysphagia and dysarthria, which are uncommon in MFS. We should know if cranial nerves IX and X were affected in this patient.

Figure 1 shows 20 patients but only 18 patients were included in the study.<sup>1</sup> The discrepancy should be solved.

Overall, the interesting study has some limitations and inconsistencies that call the results and their interpretation into question. Addressing these limitations could further strengthen and reinforce the statement of the study. Neurological adverse reactions to SARS-CoV-2 vaccinations are not infrequent.

## Data Sharing Statement

All data are available from the corresponding author.

## Ethics Approval

Was in accordance with ethical guidelines. The study was approved by the institutional review board.

## Consent to Participate

Was obtained from the patient.

## Consent for Publication

Was obtained from the patient.

## Author Contributions

JF: design, literature search, discussion, first draft, critical comments, final approval.

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## Disclosure

The authors declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest in this communication.

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