

LETTER TO THE EDITOR

SARS-CoV-2 vaccines are not free of neurological side effects

With interest, we read the article by Lu et al. about a systematic review of published neurological adverse reactions to SARS-CoV-2 vaccines.¹ Included were 48 articles, and it was concluded that no severe neurological adverse reactions to any of the currently available SARS-CoV-2 vaccines have been reported.¹ The review is appealing but raises the following comments and concerns.

We disagree with the conclusions that SARS-CoV-2 vaccines do not trigger neurological adverse reactions. Though rare, mild and severe neurological side effects have been occasionally reported.² Search platforms and data bases to detect scientific reports about neurological adverse events may not be particularly helpful and do not provide many hits, but thorough assessments of various publications and their reference lists may help to find appropriate publications. Data from the mRNA vaccine clinical trials showed that 7 cases out of 37,000 vaccine recipients developed Bell's palsy.² In the DNA-based Johnson & Johnson vaccine trial, one patient each in the vaccinated and placebo group developed Guillain-Barre syndrome (GBS).² According to the FDA Adverse Event Reporting System (FAERS), 9442 reports of adverse reactions to the vaccines have been submitted to VAERS as of March 2, 2021.² The most common neurological symptoms included dizziness, headache, pain, muscle spasms, myalgia and paresthesias, which are expected to occur as acute, transient effects of the vaccination. Rare cases of tremor, diplopia, tinnitus, dysphonia, seizures and reactivation of herpes zoster have been also reported. There were also cases of stroke ($n = 17$), GBS ($n = 32$), facial palsy ($n = 190$), transverse myelitis ($n = 9$) and acute disseminated encephalomyelitis (ADEM) ($n = 6$) in the VAERS database.² In a trial with the Sinovac and Sinopharm vaccines, 68% of participants reported post-vaccination headache and 60% had myalgia.³ In the coronavirus vaccine trial, 2 patients with transverse myelitis were reported.⁴ In a 57yo man with a history of two previous facial palsies, a third Bell's palsy developed 36 h after the second dose of an mRNA-based SARS-CoV-2 vaccine.⁵ Facial palsy has been also reported in a study of patients undergoing a SARS-CoV-2 vaccination with mRNA-based vaccines.⁶ There is also one report about a deep venous thrombosis (DVT) following the second dose of an mRNA vaccine.⁷ Since DVT is a potential risk factor for ischaemic stroke in case of a patent foramen ovale (PFO), we should recognize that venous thrombosis as a potential side effect of SARS-CoV-2 vaccines may secondarily concern also the neurologist.

In addition to these publications, we observed several patients with neurological compromise, in whom it was conceivable that neurological compromise was causally related to a recent SARS-CoV-2

vaccination. In a 73yo woman, ischaemic stroke occurred 7 h after the first dose of an mRNA-based vaccine. Since she also had the risk factors smoking and arterial hypertension, it remained speculative if there was truly a causal relation between the vaccination and the stroke. In a second patient, a 29yo woman, ischaemic cerebellar stroke occurred 4 days after the first dosage of a vector-based SARS-CoV-2 vaccine. In this case, stroke was attributed to smoking and a questionable PFO, not confirmed on transthoracic echocardiography. A third patient, a 32yo man, experienced a relapse of GBS 8 days after the first dose with a vector-based SARS-CoV-2 vaccine. The patient did not respond sufficiently to intravenous immunoglobulins, why he is currently undergoing plasmapheresis. Furthermore, there are most likely several case reports under review or in press and not yet published, which report putative neurological adverse reaction to SARS-CoV-2 vaccines.

The rareness of reports about neurological side effects of SARS-CoV-2 vaccines may have several reasons. First, SARS-CoV-2 vaccines are available only since December 2020, why it may be simply too early to have got these cases published. Secondly, there may be a psychological inhibition to recognize and report side effects, as we all want to get rid of the global threat caused by the virus and want to return to normal life. Third, those who produce the vaccines and want to make money with their products may have a weak interest in hearing about side effects of their products why they may directly or indirectly try to avoid publications about putative adverse reactions. Fourth, there is enormous social, economic and political pressure on producers of vaccines and publishers of meeting current needs and providing an effective weapon against the pandemic, why positive reports are preferred over negative news about the handling of the global crisis.

Overall, we admit that there is a need for the development effective tools against the pandemic and that vaccination is one of these appropriate means. However, vaccines need to be safe, sufficiently tested, thoroughly approved by the authorities and largely available to meet the needs of societies for containing the spreading of the virus. Thus, there is a general responsibility of doctors, developers, producers and publishers to revitalize hibernated life why publication of side effects is a moral responsibility and should not be hindered. Scientists are asked and requested to carefully collect and manage their data and to continue with the publication of reliable data despite the current difficulties and restrictions.

KEYWORDS

COVID-19, nerves, neurological, neuropathy, SARS-CoV-2

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CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTION

JF involved in design, literature search, discussion, first draft, critical comments and final approval. FS involved in literature search, first draft, discussion, critical comments and final approval.

ETHICAL APPROVAL

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

INFORMED CONSENT

Was obtained.

Josef Finsterer¹

Fulvio A Scorza²

¹Klinik Landstrasse, Messerli Institute, Vienna, Austria

²Disciplina de Neurociência. Escola Paulista de Medicina,
Universidade Federal de São Paulo. (EPM/UNIFESP), Sao Paulo,
Brazil

Correspondence

Josef Finsterer, Klinik Landstrasse, Messerli Institute,
Postfach 20, 1180 Vienna, Austria.
Email: fifigs1@yahoo.de

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