



Correspondence



Diagnose Aseptic Meningitis Caused by SARS-CoV-2 Vaccination Only After Ruling Out All Possible Differentials

Josef Finsterer

Neurology & Neurophysiology Center, Vienna, Austria

OPEN ACCESS

► See the article “Aseptic Meningitis Following Second Dose of an mRNA Coronavirus Disease 2019 Vaccine in a Healthy Male: Case Report and Literature Review” in volume 54 on page 189.

Received: Feb 20, 2022

Accepted: Mar 1, 2022

Published online: Mar 14, 2022

Corresponding Author:

Josef Finsterer, MD, PhD

Neurology & Neurophysiology Center, Vienna,
Postfach 20 1180 Vienna, Austria.

Tel/Fax: +43-1-5861075

Copyright © 2022 by The Korean Society of Infectious Diseases, Korean Society for Antimicrobial Therapy, and The Korean Society for AIDS

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Josef Finsterer

<https://orcid.org/0000-0003-2839-7305>

Funding

None.

Conflict of Interest

No conflict of interest.

Dear Editor:

We read with interest the article by Kang et al. about a 32 years-old, previously healthy male who developed occipital headache two weeks after having received the second dose of the BNT2162b2 mRNA-based anti-severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) vaccine [1]. Due to neck stiffness and elevated inflammatory parameters on blood tests, meningitis was suspected and confirmed by pleocytosis of 480/mm³ cells [1]. Acyclovir was ineffective but the patient made a full recovery upon administration of steroids [1]. The study is appealing but raises concerns that need to be discussed.

Various differential causes of aseptic pleocytosis have not been appropriately excluded. The first differential not appropriately excluded is venous sinus thrombosis (VST). VST has been previously reported in association with aseptic meningitis [2]. Though contrast medium had been applied, magnetic resonance venography has not been carried out to see if the large cerebral veins were patent or not. Further differential not excluded include myeloproliferative disorder [3], scrub typhus, Behcet's disease [4], neurobrucellosis, Japanese encephalitis, vasculitis, hepatitis-E, and paroxysmal nocturnal hemoglobinuria [5].

Other differentials of headache with pleocytosis not considered include reversible, cerebral vasoconstriction syndrome (RCVS) [6,7], subarachnoid bleeding, and cerebral vasculitis [8]. Since RCVS has been previously reported as a complication of SARS-CoV-2 vaccinations [7], and since it usually responds favourably to nimodipine, it is crucial to exclude this differential upon computed tomography angiography [6].

A further limitation of the study is that the cerebrospinal fluid was not tested with a PCR for SARS-CoV-2. The nasopharyngeal swab test by PCR for SARS-CoV-2 can be negative in patients with SARS-CoV-2 associated meningitis or encephalitis.

It would have been useful to exclude autoimmune encephalitis by determination of autoantibodies, such as NMDA, LGI1, GABA, CASPR2, and several others.

Aseptic meningitis has been previously reported as a complication of SARS-CoV-2 vaccinations. Dupon et al. reported aseptic meningitis in a 34 years-old female who developed severe headache and fever after the second Pfizer dose [9]. Complete recovery was achieved with steroids [9]. Reis Carneiro et al. reported a 62 years-old female with headache without fever starting one day after the first dose of the BNT162b2 vaccine [10]. The patient made a full recovery under steroids. The case reported by Lee et al. concerns an 18 years-old male who developed headache accompanied by fever, chills, and nausea three weeks after the second dose of the BNT162b2 vaccine. He had pleocytosis of 10,020/mm³ predominantly neutrophils. The patient recovered completely after a few days without treatment.

Overall, the interesting case report has several limitations which challenge the results and their interpretation. Before interpreting aseptic meningitis as an adverse reaction of a SARS-CoV-2 vaccine various differentials have to be thoroughly excluded.

REFERENCES

1. Kang HS, Kim JE, Yoo JR, Oh H, Kim M, Kim YR, Heo ST. Aseptic meningitis following second dose of an mRNA coronavirus disease 2019 vaccine in a healthy male: case report and literature review. *Infect Chemother* 2022;54:189-94.
[PUBMED](#) | [CROSSREF](#)
2. Wong VS, Adamczyk P, Dahlin B, Richman DP, Wheelock V. Cerebral venous sinus thrombosis presenting with auditory hallucinations and illusions. *Cogn Behav Neurol* 2011;24:40-2.
[PUBMED](#) | [CROSSREF](#)
3. Benmalek R, Mechal H, Zahidi H, Mounaouir K, Arous S, Benouna MEG, Drighil A, Habbal R. Combined venous and arterial thrombosis revealing underlying myeloproliferative disorder in a young patient: a case report. *J Med Case Rep* 2021;15:76.
[PUBMED](#) | [CROSSREF](#)
4. Borhani-Haghighi A, Kardeh B, Banerjee S, Yadollahikhales G, Safari A, Sahraian MA, Shapiro L. Neuro-Behcet's disease: An update on diagnosis, differential diagnoses, and treatment. *Mult Scler Relat Disord* 2019;39:101906.
[PUBMED](#) | [CROSSREF](#)
5. Rafałowska J, Dzięwulska D, Szyluk B, Wiczorek J. Morphological picture in paroxysmal nocturnal hemoglobinuria. Case report. *Folia Neuropathol* 1994;32:161-6.
[PUBMED](#)
6. Kraayvanger L, Berlit P, Albrecht P, Hartung HP, Kraemer M. Cerebrospinal fluid findings in reversible cerebral vasoconstriction syndrome: a way to differentiate from cerebral vasculitis? *Clin Exp Immunol* 2018;193:341-5.
[PUBMED](#) | [CROSSREF](#)
7. Finsterer J. First reported case of reversible cerebral vasoconstriction syndrome after a SARS-CoV-2 vaccine. *Cureus* 2021;13:e19987.
[PUBMED](#) | [CROSSREF](#)
8. Sauret A, Stievenart J, Smets P, Olagne L, Guelon B, Aumaitre O, André M, Trefond L. Case of giant cell arteritis after SARS-CoV-2 vaccination: a particular phenotype? *J Rheumatol* 2022;49:120.
[PUBMED](#) | [CROSSREF](#)
9. Dupon V, Arnaert S, Van Haute E, Vulsteke F, Diet G, De Schoenmakere G. Aseptic meningitis after SARS-CoV-2 Pfizer/BioNTech vaccination. *Acta Clin Belg* 2021:1-4.
[PUBMED](#) | [CROSSREF](#)
10. Reis Carneiro D, Matos A, Morgadinho A. Steroid-responsive aseptic meningitis after BNT162b2 SARS-CoV-2 vaccine. *Rev Neurol (Paris)* 2022;178:160-1.
[PUBMED](#) | [CROSSREF](#)