

Aseptic Meningoencephalitis and Myelitis Temporally Associated with SARS-CoV-2 Vaccination

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Clinical Presentation

A thirty-five year old South African gentleman presented with headache, fever, myalgia and confusion.

He returned to Ireland from South Africa thirty-five days prior to presentation; he spent four weeks there in an urban center. He did not take malaria prophylaxis and denied contact with animals or insect bites, or sick contacts. He was well during his stay and remained well for sixteen days on return. He received a booster dose of the Pfizer-BioNTech SARS-CoV-2 vaccine fourteen days prior to presentation; he previously received Pfizer-BioNTech for the initial two doses and on both occasions, he developed fever and headache lasting several days. There was no history of primary SARS-CoV-2 infection. He was in a monogamous heterosexual relationship with his wife and denied intravenous drug use.

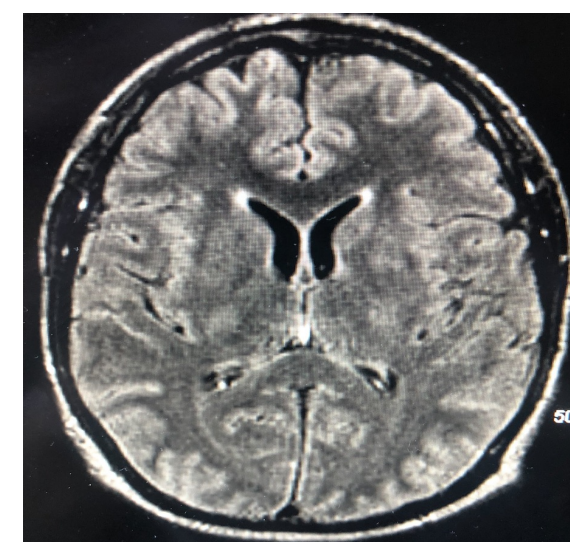
Symptoms persisted for two weeks following vaccination and new-onset confusion prompted presentation. He was febrile, disorientated to person and place with nuchal rigidity and urinary retention. Within 48 hours he developed a rapid ascending flaccid paralysis with bulbar involvement and features of autonomic instability. He was transferred to ICU, requiring intubation for airway protection.

Relevant Investigations

Lumbar Puncture	5/12/21	8/12/21	14/12/21	31/12/21
WBC Count	134, 90% lymphocytes	43, 95% lymphocytes	2	134, 100% lymphocytes
RBC Count	13	17	56	1
CSF Protein	2.55 g/L	1.02 g/L	1.09 g/L	0.59 g/L
CSF Glucose (Serum)	1.9 (5.2) mmol/L	2.9 (8.3) mmol/L	2.6 (6.0) mmol/L	3.8 (6.6) mmol/L

- CSF PCR and culture negative, including TB at 12 weeks
- Adenosine deaminase in CSF 4.0 IU/L (elevated if >7)
- Blood cultures positive for fusobacterium day 1, subsequent blood cultures day 1,3,4 and 6 x 2 negative.
- SARS-CoV-2 PCR negative x 3, malaria screen negative x 3
- Enteral pathogen PCR and culture, ova and parasites negative
- Nasopharyngeal swab and bronchoalveolar lavage negative for BioFire® Respiratory Panel
- Extended serologic testing including HIV, Syphilis, Mumps, Measles, Rubella, Flaviviruses, Rickettsiae and Chikungunya negative

MRI brain and spine showed diffuse abnormal signal within the sulci with associated oedema, leptomeningeal enhancement and long segment hyperintense signal with oedema in the cord, suggestive of meningomyelitis.



Management

He commenced on empiric antimicrobial cover for bacterial, viral, rickettsial and mycobacterium tuberculosis infections. CT angiogram of neck was normal. With a negative work-up for infectious aetiology and concern for an immune-mediated phenomenon, high-dose methylprednisolone and intravenous immunoglobulin treatment was commenced. There was complete recovery of cognition but persistent flaccid paralysis. Plasmapheresis was trialled, with marked improvement of power in the distal upper limbs. Serology for neurologic autoantibodies were negative. After seven weeks in hospital, the patient returned to South Africa for rehabilitation and continues to improve.

Discussion

Guillain-Barre Syndrome has been reported post-vaccination, including SARS-CoV-2 vaccination^{1,2}. There are several case reports in the literature describing encephalitis post SARS-CoV-2 vaccination and individuals responded well to glucocorticoids, IVIG and plasmapheresis^{2,3}. In this case, the temporal association with vaccination and absence of an alternative diagnosis suggests an immune-mediated meningoencephalomyelitis triggered by SARS-CoV-2 vaccination. To our knowledge, this is the first such report in Ireland and the second report in the literature following a booster dose⁴.

References:

1. Patone M, et al. Neurological complications after first dose of COVID-19 vaccines and SARS-CoV-2 infection [published correction appears in Nat Med. 2021 Nov 29;]. Nat Med. 2021;27(12):2144-2153.
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3. Garg RK, Paliwal VK. Spectrum of neurological complications following COVID-19 vaccination. Neurol Sci. 2022;43(1):3-40. doi:10.1007/s10072-021-05662-9
4. Sluyts Y, et al. COVID-19-booster vaccine-induced encephalitis. Acta Neurol Belg. 2022 Apr;122(2):579-581.