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Case Report

Post-SARS-CoV-2-Vaccine Autoimmune Encephalitis: A Case Report

Luis Rafael Solís Tarazona[1]*, Carmen María Sanchis Llopis[1], Rafael Francisco Galiano Blancart[1], José Manuel Ferrer Casanova[1] and Lamberto Landete Pascual[1]

[1] Neurology department, University Hospital Doctor Peset, Valencia, Spain.

***Corresponding Author:** Luis Rafael Solís Tarazona, Neurology Department, University Hospital Doctor Peset, Avenida Gaspar Aguilar 90, Valencia, Spain.*

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Abstract

We present a clinical case of a young woman with no prior history of neurological or psychiatric disease, with an acute episode of purely cognitive and psychiatric symptoms ten days after receiving SARS-CoV-2 vaccination. Multiple tests were practised in order to exclude metabolic, infectious, autoimmune and paraneoplastic diseases. Two repeated cerebro-spinal fluid (CSF) samples showed high lymphocytes with normal proteins, and neither radiological studies nor extensive autoimmune studies showed abnormal results. The patient was given a full treatment with intravenous high-dose corticosteroids and immunoglobulin. She was totally recovered when discharged.

***Keywords:** SARS-CoV-2, vaccine, encephalitis, neuroinflammation, case report*

Introduction

Vaccination is a highly effective way for preventing infectious diseases. However, although generally safe, vaccines are not risk-free. Plausible side effects of vaccination have been reported for years[1], and tend to provoke a huge social impact. Also, causal relationships between symptoms and vaccines are not always found.

In this clinical case we present an acute episode of cerebral inflammation with psychiatric and cognitive symptoms in which no other cause was found but a recent vaccination.

Clinical Case

A 28-years-old woman was hospitalised in our facilities after coming to the emergency room (ER) keenly alert but disoriented, not responding to all commands, with headache, sparse spoken language, and purposeless, stereotyped movements and catatonic positions. Symptoms progressed within previous 24-48 hours. On physical examination there was no neck stiffness and no focal neurological signs. Neither myoclonic movements nor seizures were described.

Ten days before the patient got vaccinated for SARS-CoV-2 (ChAdOx1nCoV-19). The next two days she presented a self-limited episode of mild fever and malaise that ceded with ibuprofen.

Routine diagnostic tests in the ER did not show significant abnormalities, including blood and urine samples for toxic, metabolic and infectious causes, head CT-scan, chest X-ray and EKG. CSF showed a high white-cell count (23 cells/mm3, 95% lymphocytes) and normal protein levels. CSF and serum microbiological studies (herpes-family viruses, HIV, N. meningitidis, S. pneumoniae, L. monocytogenes, syphilis and others) were negative. Therapy with ceftriaxone, vancomycin and acyclovir was initiated while microbiological results came.

During hospitalisation, a new LP showed persistence of moderate lymphocytosis. Also CSF and blood serum studies for autoimmune and paraneoplastic causes were negative. Up to two MRIs were done, two weeks apart, which did not show abnormalities. Two EEGs only showed signs of diffuse cerebral suffering, more accused on the left hemisphere. Body CT scan and body-PET-CT study were done, which did not show any significant abnormality.

Because the main diagnostic suspect was to be inflammatory, antibiotic therapy was stopped and therefore started with high-dose corticosteroids (1g/day for 5 days) and intravenous immunoglobulin for five days, too. During and after the treatment, the patient slowly recovered his mental status ***- figure 1***-. The patient was finally discharged asymptomatic after 24 days.

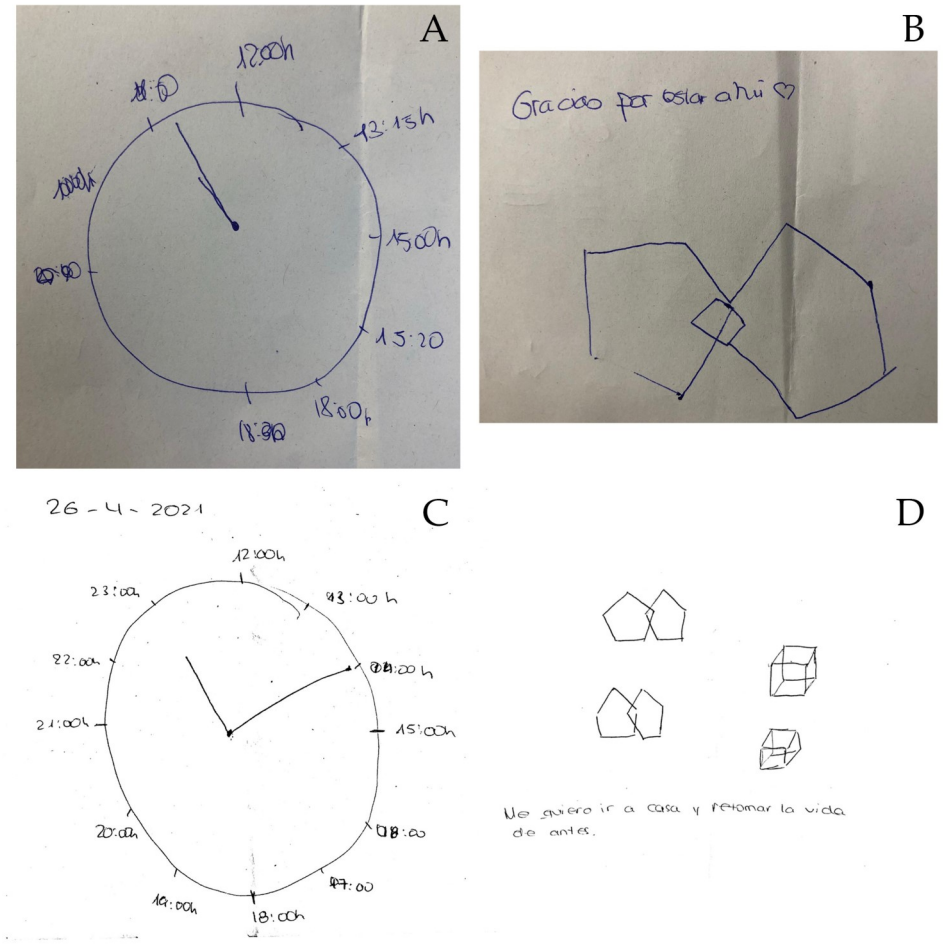

Figure 1. *Images from two tests (clock-drawing test and last part of the Mini-mental state examination) practised during different moments of the hospitalization. A and B were done on day 10, while on immunosuppressive drugs. C and D were done on day 21, with the patient practically recovered.*

Discussion

Often it is a difficult process to prove that a clinical finding is directly caused by one drug, therapy or, as in our case, a vaccine. It is necessary to accumulate evidence in order to make a definitive statement, and that is why the clinical case hereby presented is not enough to prove that vaccination was the origin of our patient's symptoms. However, the diagnostic approach is correct, and the temporal relationship favours our theory.

Vaccines frequently reported as a source of neurological complications are, for instance, poliovirus (mainly oral)[2] and yellow fever vaccines[3]. Frequently reported neurological complications are vaccine-associated paralytic poliomyelitis (VAPP), febrile seizures, Guillain-Barré syndrome (GBS) and other such as encephalitides, although often there is no clear evidence for these complications[4].

Some authors have reported cases of anti-NMDA receptor encephalitis after receiving different vaccines[5]. However, our patient showed negative results for this and for other paraneoplastic and cell-surface autoimmune encephalitides.

SARS-CoV-2 is a novel virus which mainly affects the respiratory system. Neurological complications are generally mild and include headache, dizziness, and loss of olfaction and taste; although some more serious and infrequent neurological complications have been reported, too, such as GBS and meningoencephalitis[6].

Vaccines against SARS-CoV-2 that are currently approved in Europe and US are mRNA-based (tozinameran and mRNA-1273) and DNA adenovirus-based (ChAdOx1nCoV-19 and Ad26.COV2.S). Side-effects are usually mild. However, more serious problems have been reported, like blood clots and venous sinuses thrombosis, but their frequency is very rare[7]. As far as the authors know, no post-vaccine encephalitis cases have been reported in the post-marketing phase yet with SARS-CoV-2 vaccine use.

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Declarations of Interest

The authors declare that there is no conflict of interest.

Informed Consent

The patient provided consent for the publication of this clinical case.

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