



## Systemic reaction with predominant neurological and skin manifestations following the third dose of the mRNA-1273 COVID vaccine (case report) | 1

BNT162b2 (Pfizer- BioNTech) and mRNA 1273 (Moderna) vaccines were the first messenger RNA (mRNA)-based vaccines ever approved. In both vaccines, a mRNA sequence determines the structure and assembly of the immunogen, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike (S) glycoprotein. In this case report, the author from Austria presented a patient who developed a systemic reaction immediately after the third dose of the mRNA-1273 vaccine. This systemic reaction was characterized by predominant neurological and skin manifestations and lasted eleven months. Recently, an autopsy study also reported systemic reaction with multifocal necrotizing encephalitis, mild myocarditis, and endothelitis in small blood vessels following the third dose of the COVID-19 vaccine.

<https://discovermednews.com/autopsy-report-necrotizing-encephalitis-myocarditis-endothelitis-after-anti-sarscov2-vaccination/>

### ***The case***

A 39-year-old man received the first dose of the mRNA-1273 (Moderna) COVID-19 vaccine in May 2021 without any major side effects. In his medical history, he had chronic sinusitis for 15 years, neurodermatitis for two years, keratoconus, and mild tinnitus. He didn't take any medications regularly. After the second dose of the mRNA-1273 vaccine in June 2021, he experienced a fever of up to 39.5° C, drowsiness, and a severe skin reaction between his legs, lasting two to three weeks. His body temperature fluctuated.

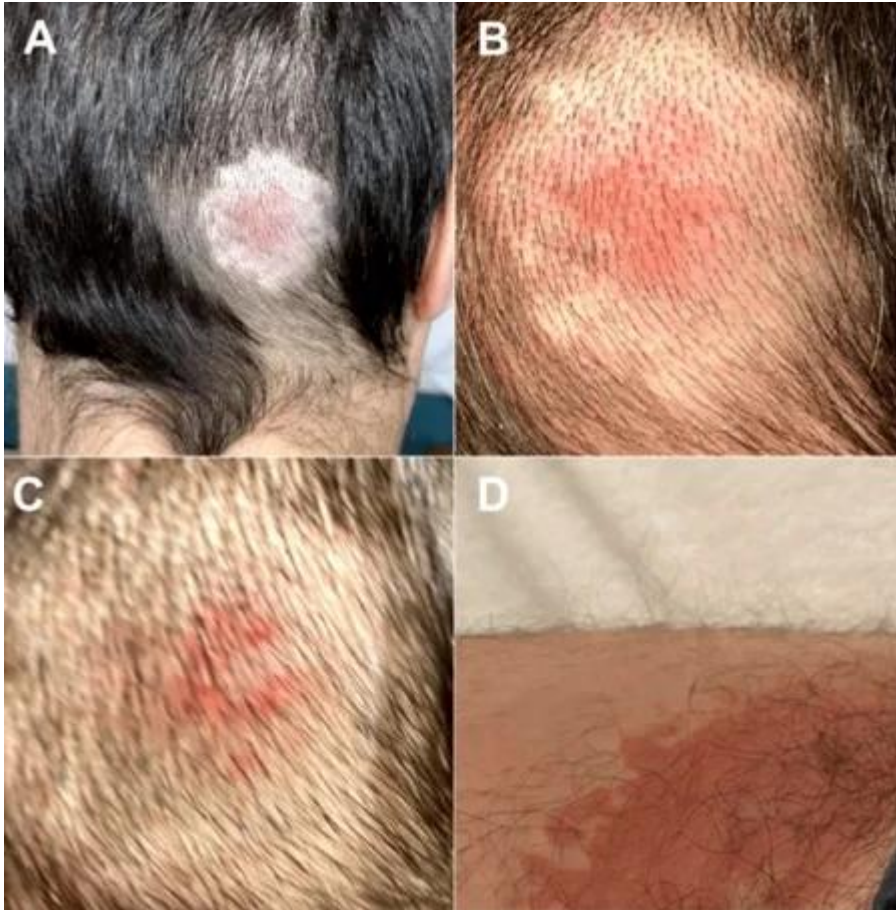
After the third dose of the mRNA-1273 vaccine, he experienced a systemic reaction with a fever of 38.8 °C and severe headache. The third day after the third vaccination, various neurological symptoms occurred, including drowsiness, vertigo, severe headaches, a sensation of pulling in the left part of his head, pressure and heat in the forehead and left temporal region, insomnia, a pulsating sensation in the head at night, photophobia, sensitivity to noise, left-sided eyelid twitching, and fasciculations.

He also had numerous cognitive disorders like disorientation, derealization, difficulties in memory, concentration, abstract thinking, palinopsia (visual perseverations), and aphantasia (he was unable to visualize images after closing his eyes). He also had emotional disorders.

On the fourth day after the third vaccination, the patient noticed bilateral tinea inguinalis. On the sixth day, round inflamed patches with hair loss occurred in the right occipital area, resembling tinea capitis (photo).

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Original photography from the article of Finsterer J, 2022

Other signs and symptoms also occurred, such as polyarthralgia, disturbed ejaculation, pain in the right armpit (vaccination arm), and swelling of lymph nodes in the left armpit.

The antibodies against the SARS-CoV-2 S protein were consistently elevated throughout the disease but gradually declined. The antibodies against SARS-CoV-2 nucleocapsid (N) were normal, showing that the patient was not infected with SARS-CoV-2.

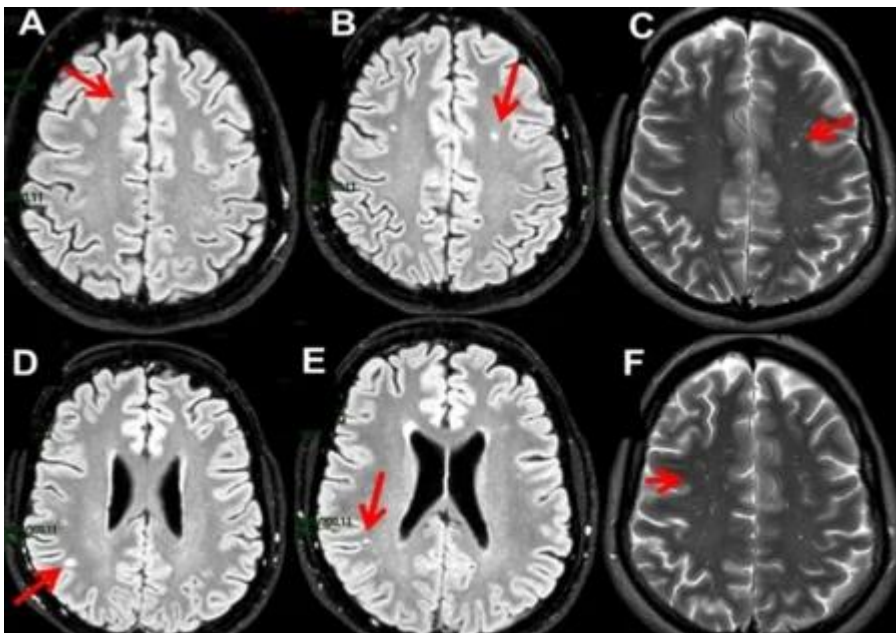
The laboratory analysis showed a normal blood cell count, total lymphocytes, CD16+56+ lymphocytes, CD4+T lymphocytes, CD8+ T lymphocytes, and CD19+ B lymphocytes. The relative number of CD4+ T-cells and the CD4/CD8 ratio were reduced, whereas the relative number of CD8+ T-cells was increased. The electrolyte levels, kidney and liver function parameters, and blood coagulation parameters were within normal limits. Vitamin B12 and vitamin C levels were low, and the salivary cortisol level was elevated at baseline, as well as after five and eight hours. Parameters of connective tissue diseases were not informative.

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Antinuclear antibodies were not detected. Electrocardiogram and transthoracic echocardiography were normal.

At six weeks after the third vaccination, electroencephalography demonstrated discrete theta waves over the left frontotemporal projections. Two months after the third vaccination, T2-FLAIR brain magnetic resonance imaging (MRI) demonstrated focal hyperintense white matter lesions in the frontotemporal distribution. The patient refused a lumbar puncture.



*Original MRI scan from the article of Finsterer J, 2022*

The administration of non-steroidal anti-inflammatory drugs, antihistamines, angiotensin II receptor antagonists, and statins had a beneficial effect, but only temporarily. Nattokinase and quercetin occasionally provided some relief. Ibuprofen and a single dose of methyl-prednisolone worsened the symptoms.

A significant improvement in photophobia and brain fog was achieved after four months of treatment with NSAIDs, whereas the full recovery of cognitive functions required another four months. Sartans and statins also improved cognitive dysfunction and led to symptom stability. Since then, the symptoms have occasionally resurfaced. Discontinuation of statin therapy led to severe headaches. The patient is still receiving long-term drug therapy.



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### *Conclusion*

This study reported a patient who developed a systemic reaction immediately after the third dose of the mRNA-1273 (Moderna) COVID-19 vaccine. The reaction was characterized by predominant neurological and skin manifestations and lasted eleven months.

This article was published in Cureus.

### **Journal Reference**

Finsterer J. A Case Report: Long Post-COVID Vaccination Syndrome During the Eleven Months After the Third Moderna Dose. Cureus; 2022; 14(12): e32433. (Open Access)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9833629/>

