

# Delirium triggered by COVID-19 vaccine in an elderly patient

**Keywords:** COVID-19, COVID-19 vaccine, delirium, elderly, frail.

Dear Editor,

Delirium is a neurological syndrome marked by sudden onset of confusion, a fluctuating course, inattention and often an abnormal level of consciousness; it is also known as acute brain failure.<sup>1,2</sup> Some of the predisposing conditions are preexisting cognitive impairment, multiple comorbid conditions, polypharmacy and impaired sensation. Among precipitating factors, there are severe illness, surgery, new psychoactive medication, pain, environmental change, electrolyte disturbances and urine/fecal impaction.<sup>1,3</sup>

BNT162b2 is a lipid nanoparticle-formulated nucleoside-modified RNA encoding the SARS-CoV-2 full-length spike, which has been approved as a vaccine against COVID-19.<sup>4</sup> Most common adverse effects in older adults include fever, fatigue, headache, chills, vomiting, diarrhea, muscle pain and joint pain.<sup>4</sup>

Herein, we describe the case of an 89-year-old patient, who developed delirium after the administration of the aforementioned vaccine.

An 89-year-old patient presented to the office the second day after the first dose of BNT162b2 COVID-19 vaccine was given, with a 24-h history of confusion, fluctuating attention, anxiety and inversion of the sleep-wake cycle. He had personal history of type 2 diabetes mellitus, hypertension, stage III-b chronic kidney disease, prostatic hyperplasia, mild hearing impairment and depressive disorder; regular use medications included detemir/aspart insulin, empagliflozin, bisoprolol, telmisartan, tamsulosin and mirtazapine. The patient is fully independent for basic life activities.

Upon clinical examination, vital signs were stable and within normal parameters, with no evidence of dehydration. He was inattentive and had oscillatory movements of the trunk; however, no signs of neurological focalization or meningeal irritation were found. He denied headache, sore throat, cough, sneezing, rhinorrhea, abdominal pain, diarrhea, dysuria and any other symptom, with the exception of pain at the site of the injection and muscular back pain.

Laboratory data were as follows: hemoglobin, 12.9 g/dL; leukocytes,  $8.9 \times 10^9/L$ ; neutrophils,  $5.8 \times 10^9/L$ ; lymphocytes,  $1.2 \times 10^9/L$ ; platelets  $320 \times 10^9/L$ ; glucose, 208 mg/dL; urea, 77 mg/dL; creatinine, 1.7 mg/dL; and C-reactive protein, 7.0 mg/dL (reference values: 0–6.0). In the urinalysis, no leukocyturia or nitrites were reported.

As there were no clinical data of infection at any site, and no alarm features were present, acetaminophen for the back and injection-site pain was indicated, with quetiapine 12.5 mg as a night sedative, as well as close observation.

Over the next 48 h, the patient showed gradual improvement, with recuperation *ad-integram* to the previous functional state.

Quetiapine was stopped after 1 week, and the patient has been doing well thereafter. Unfortunately, both the patient and his family rejected the second dose of the vaccine.


It is thought that many of the adverse effects of COVID-19 vaccine are triggered by the systemic inflammatory response.<sup>4</sup> In addition, we know that the systemic inflammatory response causes modifications in brain physiology and has been related to the sepsis-associated delirium.<sup>5</sup>

This patient had several predisposing factors for delirium such as age, polypharmacy and sensitive impairment, and we consider that this vaccine-induced immune reaction was enough to disrupt his frail homeostasis.

To our knowledge, this is the first case report of COVID-19 vaccine associated with delirium. It is important that physicians are aware that this might happen, so they have close observation of their patients, and warn high-risk patients and their families.

## Disclosure statement

The authors declare no conflict of interest.

Luis Fernando Zavala-Jonguitud<sup>1</sup>  and  
Carla Cristina Pérez-García<sup>2</sup>

<sup>1</sup>Oncology Department, American British Cowdray  
Medical Center, México City, Mexico

<sup>2</sup>Geriatrics Department, American British Cowdray  
Medical Center, México City, Mexico

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