

VIEWPOINT

Helping the Public Understand Adverse Events Associated With COVID-19 Vaccinations

Lessons Learned From Functional Neurological Disorder

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By the end of January 2021, more than 97.3 million doses globally and 31.8 million doses in the United States have been administered of the COVID-19 vaccine.¹ Although important postmarketing surveillance is ongoing, it is currently highly effective and safe, with adverse effects including transient symptoms such as fever/chills, headache, fatigue, myalgia/arthralgia, lymphadenopathy, nausea, or local effects of swelling, erythema, or pain.² With the public being vaccinated, there have recently been videos circulating on social media about major neurologic adverse events after administration of the COVID-19 vaccine.³ A few of these videos have been viewed millions of times by the public.³ Some depict individuals with continuous movements of the trunk and limbs or walking difficulties. The spread of these videos has fueled vaccine hesitancy concerns and without effective communication by medical professionals to the public, this can lead to reduced vaccination rates and an unnecessary prolongation of the pandemic. It must be noted that these videos may be unsubstantiated, and it is not definitively known if the COVID-19 vaccine was administered in these cases. However, it was reported in the news that at least 1 patient was told by their physician that the diagnosis was conversion disorder,⁴ also known as functional neurological disorder (FND). Here, we provide context regarding potential associations between FND and COVID-19 vaccinations, as effective communication regarding this intersection is critically important.

It is imperative to note that we are not providing a medical diagnosis for these specific cases because we are not the treating physicians. The only information analyzed is from what is publicly available, and we wish to discuss FND and vaccinations in the general sense. However, in some instances, these videos show evidence of rule-in signs consistent with functional motor symptoms such as asynchronous movements that are variable in frequency and amplitude.⁵ The Functional Neurological Disorder Society has issued a statement that features in these videos are seemingly consistent with FND.⁶ FND is not a diagnosis of exclusion and is in fact among the most common conditions encountered in the outpatient neurology setting. Notably, even some cases, unrelated to vaccinations, presented by the media as medical mysteries are FND with very high interrater agreement across experts.⁷ In addition, some of the most widely viewed videos on YouTube portraying movement disorders were found by experts to be consistent with FND.⁸

FND is a real, brain-based disorder at the intersection of neurology and psychiatry whereby patients develop a range of neurological symptoms precipitated and

perpetuated by biological, psychological, and/or environmental factors, reflecting the biopsychosocial model for clinical formulation described by George Engel, MD.⁹ FND can be triggered by physical and/or emotionally valenced events, including head injury, medical/surgical procedures, and vaccinations. These precipitating factors, while proximal to the development of the symptoms, are not directly caused by the substances in the vaccine in the same manner that, for example, *Neisseria meningitidis* is the cause of meningitis. Instead, factors such as expectations, beliefs, heightened bodily attention, arousal, and threat/emotional processing play important mechanistic roles in the pathophysiology of FND. A Bayesian hierarchical neurocognitive model posits that abnormal expectations or beliefs can interact with sensorimotor perceptions to provide in part the mechanistic equation for functional neurological symptoms.¹⁰ In precipitating physical events, including vaccinations, it is the attention drawn toward the body that is the important biological process, rather than direct neurotoxic or immune-mediated processes. Additionally, vaccines can produce nociceptive experiences, such as local injection site reactions or systemic myalgias, and these unpleasant sensations can promote the redirection of attention toward the body.

It is also important to note that FND is distinct from feigning (such as malingering and factitious disorder) because patients with functional movements perceive their symptoms as involuntary. Early conversion disorder models articulating a universal theory that psychological stress is being converted into physical symptoms are also outdated, as evidence underscores that not all patients with FND endorse a history of adverse life experiences. Following diagnosis based on physical examination signs and semiological features, treatment includes education on the diagnosis, physical rehabilitation, and cognitive behavioral therapy. In physical therapy, attentional mechanisms are leveraged (including distraction) to retrain the brain to move automatically again, while in cognitive behavioral therapy, relationships between physical symptoms, thoughts, behaviors, emotions, and life factors are explored. Treatments also include important roles for recognizing bodily signs of distress and receiving training in relaxation techniques that can lower the body's heightened arousal states.⁵

With regards to the intersection of FND and COVID-19 vaccinations, the response from the US Centers for Disease Control and Prevention has so far been to reiterate the safety of the vaccines, without directly addressing these cases.^{3,4} As concern grows, there is a need for health care officials to directly educate the

public regarding this issue. A lack of direct messaging may be falsely perceived by the public that the Centers for Disease Control and Prevention is not properly surveilling adverse symptoms or, even worse, concealing them. These patients may feel unheard or ignored, and that can raise more distrust with health care officials.

As neurologists, and health care professionals more broadly, we must explain transparently and nonjudgmentally the nature of FND, including that these symptoms are real but not the direct result of toxic vaccine effects. They can theoretically happen with a trigger such as injecting saline, and these events do not mean the

current vaccines are unsafe. Furthermore, not only is there a need to educate the public on FND (the most common neurological condition that most people have never heard of), but nocebo effects more broadly. Transparency and effective communication are needed in our society more than ever, and a condition as prevalent and potentially debilitating as FND can no longer remain marginalized and in the shadows. Effective communication will help educate the public and reduce fears so that patients can make informed decisions for themselves on receiving the vaccine to reduce the risk of COVID-19.

ARTICLE INFORMATION

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