E-Poster

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Multisystem Post-Vaccine Syndrome and Neuroinflammation: The Central Role of Rehabilitation in Restoring Cognitive and Functional Health

Topic: Complications/Sequelae (ie Spasticity, Immobilization and Frailty)

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BACKGROUND

Coronavirus Disease 2019 (COVID-19) has been associated with brain and vascular inflammation, compromising the blood-brain barrier (BBB) due to spike protein interactions with angiotensin-converting enzyme 2 receptors,microglial activation and endothelial dysfunction. Rare post-vaccine complications require investigation into the potential long-term effects of spike protein exposure on neurovascular homeostasis. This case illustrates chronic post-vaccine neuroinflammation, vascular dysregulation, and cognitive impairment, emphasizing diagnostic and therapeutic challenges.

CASE DESCRIPTION

Having the patient's informed consent, we present the case of a previously healthy 38-year-old woman with no history of COVID-19 who developed a severe multisystem syndrome following the prophylactic viral vector vaccine. Within hours post-vaccination, she experienced profound fatigue, tachycardia and chest pain. Over the following weeks, she developed a constellation of musculoskeletal, neurological, dermatological, gastrointestinal, ophthalmological, and hematological complications. Laboratory tests revealed leukopenia, neutropenia, elevated inflammatory cytokines (vascular endothelial growth factor, soluble CD40 ligand), and coagulation abnormalities. Extensive screening for neuromyelitis optica, autoimmune and infectious diseases was negative. Brain imaging showed depot pathology in the basal ganglia-globus pallidus, putamen, dentate nuclei. Neurological and ophthalmological assessments confirmed bilateral perineuritis optica and optic nerve atrophy. Genetic findings revealed multiple predispositions: upregulated CYP17A1 (favoring conversion to cortisol, androgen, and estrogen) and interferon-γ and tumor necrosis factor activity (kynurenine pathway activation and serotonin depletion), deletions in genes associated with impaired

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detoxification and oxidative stress susceptibility. Dysregulated dopamine, serotonin, and noradrenaline metabolism was also noted. At three years post-vaccination, dark-field microscopy showed blood acidity and signs of active viral infection, while brain imaging revealed significant volume loss and hemosiderin deposition. The patient underwent various emergent therapies, including intravenous antioxidants, laser, and ozone therapy, which provided only transient relief. Antiretroviral therapy led to significant improvement in headaches, tachycardia, and brain fog. Physiotherapy interventions (pulsed electromagnetic field, polarized light capacitive and resistive energy transfer, low-level laser therapies) and kinesiotherapy proved more effective than infusions in improving brain fog and overall quality of life (QoL), emphasizing the role of rehabilitation strategies in post-vaccine neuroimmune dysfunction.

DISCUSSION

Her refractory condition continues to significantly diminish her QoL, work performance, and economic resources and brings attention to long-term disability and potential post-vaccine immune dysregulation.

CONCLUSION

This case illustrates a severe post-vaccine multisystem disorder, raising pertinent questions regarding the role of genetic predisposition to spike protein-related toxicity, particularly its effects on BBB dysfunction, microglial activation, and oxidative stress following COVID-19 vaccination. Effective rehabilitation and multidisciplinary strategies have a central role in post-vaccine recovery.

Statement of Disclosures

None