

SEIZURES IN COVID-19

Since the beginning of the COVID-19 pandemic in Wuhan, there have been reported multiple neurological manifestations related with SARS-COVID2 virus infection including dizziness, cephalalgia, hypogeusia and hyposmia/anosmia. On a series of 214 patients, 78 (36.4%) had neurological manifestations, particularly in severe cases including stroke, altered level of consciousness and neuromuscular findings (1).

On the other hand, there are some central nervous system illnesses that have been described in relation with COVID-19 infection with some possible direct mechanisms, which include:

- Viral encephalitis
- Infectious toxic encephalopathy
- Acute cerebrovascular disease

In terms of the underlying mechanisms of these clinical entities, 4 main injuries have been described. The first corresponds to direct brain injury by circulatory or neural pathways, but others include hypoxic brain injury, immunologic brain injury and a possible angiotensin-converting enzyme 2 (ACE2) pathway (2).

In relation to new onset epileptic seizures, there has been limited evidence until now:

A 24-year-old patient experiencing fever, cephalalgia and fatigue, presented with a generalized seizure with a progressive alteration of level of consciousness 9 days after symptom onset. Initial cerebrospinal fluid (CSF) analysis reported mild mononuclear pleocytosis with posterior identification of SARS-COVID2 by PCR. Due to recurrent epileptic seizures, the patient required mechanical ventilation. Magnetic Resonance Imaging (MRI) showed hyperintensities in the right lateral ventricular wall, right hippocampus and temporal lobe, implying a ventriculitis and encephalitis by COVID-19 (3).

On the contrary, a case in Iran is described as a 30-year-old woman with five recurrent seizures during her illness course without a history of any previous episodes. CSF analysis was reported as normal, including negative PCR for SARS-COVID2. MRI did not show any positive findings. In this way, an encephalitis by viral invasion or a toxic effect by inflammatory cytokines have been postulated as the possible etiological mechanisms in this particular patient (4).

In pediatric cases, it is important to emphasize that COVID19 could be another risk factor for febrile seizures, taking into account that other types of coronaviruses could also be involved, even when it is known that enteroviruses are the most frequently associated to this condition (5). Until now, there is one case report in Denver, Colorado of an asthmatic 12-month-infant girl with fever and malaise, who presented six epileptic seizures with

cough and persistent myalgias. COVID-19 diagnostic test was ordered by exclusion once she tested negative for other viruses (6).

- (1) Mao L, Wang M, Chen S, He Q, Chang J, Hong C, et al. Neurological manifestations of hospitalized patients with COVID-19 in Wuhan, China: A retrospective case series study. *SSRN Electron J.* 2020. doi: 10.2139/ssrn.3544840.
- (2) Wu Y, Xu X, Chen Z, Duan J, Hashimoto K, Yang L, et al. [Nervous system involvement after infection with COVID-19 and other coronaviruses.](#) *Brain, Behavior, and Immunity* (2020) doi.10.1016/j.bbi.2020.03.031
- (3) Moriguchi J, Harii N, Goto J, Harada D, Sugawara H, Takamino J, et al. [A first case of Meningitis/Encephalitis associated with SARS-Coronavirus-2.](#) *International Journal of Infectious Diseases* (2020). Doi.10.1016/j.bbi.2020.03.062.
- (4) Karimi N, Shafiri Razavi A, Rouhani N. Frequent Convulsive Seizures in an Adult Patient with COVID-19: A Case Report. *Iran Red Crescent Med J.* 2020 March; 22(3):e102828
- (5) Do Hoon Han, Su Yeong Kim, Na Mi Lee, et al. Seasonal distribution of febrile seizure and the relationship with respiratory and enteric viruses in Korean children based on nationwide registry data. *Seizure* 2019; 73: 9-13.
- (6) Holohan M. [Nearly a week after COVID-19 diagnosis, 1-year-old is recovering, "happy"](#). Today [Internet]. 2020 March [cited April 2020].