

Overlap mechanisms of transient global amnesia and COVID-19 infection: review

*^{1,2,4}Maria Vasilieva, ^{1,2,4}Alexandru Gasnas, ^{1,2,3}Irina Bejenari, ¹Irina Vasilieva, ³Diana Manea, ^{1,2,4}Stanislav Groppa

¹Department of Neurology No 2, ²Laboratory of Neurobiology and Medical Genetics
Nicolae Testemitanu State University of Medicine and Pharmacy

³Department of Neurology, Epileptology and Internal Diseases, ⁴Laboratory of Cerebrovascular diseases and Epilepsy
Institute of Emergency Medicine, Chisinau, the Republic of Moldova

*Corresponding author – Maria Vasilieva. E-mail: fbi-miv@mail.ru

Abstract

Background: An increasing number of patients with Transient Global Amnesia (TGA) was reported during the COVID-19 pandemics. However, there are limited data on the mechanisms of TGA linked with this infection. The aim of the study was to analyze the effect of COVID-19 infection on the hippocampal function and its potential mechanisms for TGA. A narrative literature review was performed, while searching on PubMed the following keywords: “transient global amnesia”, “COVID-19”, “hippocampus”. Ten English-written publications (clinical cases, cross-sectional studies, prospective studies) were selected. The time period covered was 2019 – 2021. During recovery from COVID-19, frequent cases of neurocognitive deficits (78%) were reported. It’s also known that TGA can be triggered by physical and emotional stress. It is possible that TGA’s pathogenesis (arterial ischemia, venous congestion, metabolic stress) could involve the CA1 hippocampal region – the most sensitive area to hypoxia, linked to afferent inputs from the medial and lateral entorhinal cortexes. These regions include high concentrations of Zinc ions and play a key role in modulating memory and spatial learning. Meantime, SARS-CoV-2 was previously detected in the olfactory bulb, amygdala, entorhinal, temporal and frontal cortex (20%); and most severe cases COVID-19 were associated with Zinc deficiency (57.4%).

Conclusions: The review highlights the precipitating events for TGA and their implications at the hippocampal level, jointly with similar pathophysiological changes reported in the novel coronavirus infection. This could explain the effect of COVID-19 infection on the hippocampus function and the potential mechanisms for TGA.

Key word: COVID-19, transient global amnesia, hippocampus (CA1 region).