

Shahabdeen A., Abeygunawardene H.

AUTONOMIC AND VASCULAR CORRELATES OF POST-COVID BRAIN FOG

Tutor: PhD, associate professor Chepelev S.N.

*Department of Pathological Physiology
Belarusian State Medical University, Minsk*

Relevance. Post-COVID cognitive dysfunction, commonly referred to as "brain fog," affects a large proportion of patients following SARS-CoV-2 infection, but its underlying pathophysiology still remains poorly understood. New evidence suggests that autonomic nervous system dysfunction and vascular abnormalities, including peripheral ischemia, orthostatic intolerance, and sleep disruption may contribute to neurocognitive symptoms. Young adults represent a particularly understudied population, as most research has focused on older and mostly hospitalized patients. Understanding the relationship between the peripheral vascular signs and central cognitive symptoms can provide valuable information into the mechanisms of the disease and identify non-invasive biomarkers for assessment.

Aim: this survey study aims to assess the association between autonomic and vascular symptoms (cold hands, orthostatic intolerance, sleep disruption) and self-reported neurocognitive dysfunction (brain fog) in adults following a COVID-19 infection.

Materials and methods. 52 COVID-19-positive individuals were given a structured, anonymous online Google form that measured their demographics, autonomic/vascular symptoms (cold hands, orthostatic worsening, fainting), cognitive symptoms (word-finding difficulty, difficulty recalling information, sensory overload, muscle memory loss), metabolic symptoms (burning brain sensation, postprandial worsening after sugar, exercise response, post exercise malaise), and sleep disturbances (hypnic jerks). Google sheets were used to analyze the data, along with published reports from Google Scholar and PubMed from 2016 to 2026.

Results and their discussion. Cold hands (53.8%), sensory overload (42.3%), and exercise benefit (76.9%) were the most common symptoms among the 52 individuals who had previously contracted COVID-19. A few experienced post exercise fatigue and malaise (48.1%), orthostatic intolerance (worsening upon standing: 28.8%; fainting: 25.0%), and metabolic symptoms (burning brain sensation: 15.4%; sugar sensitivity: 21.2%). These results indicate that peripheral vasoconstriction and attentional dysfunction are more prevalent than dysautonomia or metabolic dysfunction in adults with post-COVID brain fog, and that most of them had reported benefits from exercise.

Conclusions. The survey indicates that post-COVID brain fog in adults is associated with a heterogeneous pattern of symptoms. Cold hands (53.8%) and sensory overload (42.3%) are the most common findings, suggesting that peripheral vasoconstriction and attentional filter dysfunction may play important roles. However, orthostatic intolerance, post-exertional malaise, metabolic symptoms, and sleep disturbances affect only a minority (15-48%) of respondents. These findings suggest that post-COVID brain fog is not driven by a single universal mechanism (such as dysautonomia or mitochondrial dysfunction) but rather represents a heterogeneous condition with multiple potential pathophysiological subtypes. The beneficial effect of exercise for 76.9% of respondents is an important clinical finding that distinguishes this cohort from ME/CFS-dominant Long COVID populations.