COGNITIVE CONSEQUENCES OF POST-COVID-19 CEREBRAL ISCHEMIC CHANGES IN PATIENTS WITH ARTERIAL HYPERTENSION AND IMPROVEMENT OF NEUROPREVENTIVE APPROACHES

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Relevance.

COVID-19 may affect not only the respiratory system but also the central nervous system. Following SARS-CoV-2 infection, some patients may develop cerebrovascular and ischemic changes accompanied by impairment of cognitive functions, including attention, memory, and executive functions. Arterial hypertension is an important risk factor for cerebrovascular disorders and cognitive decline. Therefore, assessment of cognitive function in hypertensive patients after COVID-19 and the development of effective neuropreventive strategies are of particular clinical relevance.

Objective.

To investigate the effects of post-COVID-19 cerebral ischemic changes on cognitive function in patients with arterial hypertension and to improve approaches to neuroprevention.

Materials and Methods.

The study included 104 patients with arterial hypertension who had previously experienced COVID-19. The mean age of the patients was 52.6±7.4 years. There were 58 men (55.8%) and 46 women (44.2%).

All patients underwent clinical and neurological examination, blood pressure assessment, brain magnetic resonance imaging (MRI), and neuropsychological evaluation. Cognitive function was assessed using the Montreal Cognitive Assessment (MoCA) and Mini-Mental State Examination (MMSE) scales.

According to the presence of cerebral ischemic changes and cognitive status, the patients were conditionally divided into two groups: Group I included 62 patients (59.6%) with ischemic changes detected on brain MRI, while Group II included 42 patients (40.4%) without pronounced ischemic changes.

Results.

The analysis demonstrated a higher frequency of cognitive impairment among patients with MRI-confirmed cerebral ischemic changes compared with those without pronounced ischemic abnormalities.

The mean MoCA score was 21.4±2.8 points in Group I and 25.7±2.4 points in Group II. The corresponding MMSE scores were 25.1±2.1 and 27.4±1.6 points, respectively.

Cognitive impairment was identified in 39 patients (62.9%) in Group I, compared with 12 patients (28.6%) in Group II. The most prominent impairments involved attention and concentration, short-term memory, information processing speed, and executive functions.

A moderate correlation was observed between the severity of cognitive impairment and the extent of cerebral ischemic changes on MRI ($r=0.54$; $p<0.05$).

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Cognitive impairment was more frequently observed in patients with a history of arterial hypertension lasting more than 10 years. Inadequate blood pressure control, dyslipidemia, excess body weight, and physical inactivity were also identified as additional factors potentially contributing to cognitive decline.

Neuropreventive Approach.

Based on the obtained findings, a comprehensive neuropreventive approach was proposed, including: adequate blood pressure control; correction of modifiable vascular risk factors; regular cognitive screening; increased physical activity; optimization of sleep and dietary habits; cognitive training and neurorehabilitation; and regular neurological and therapeutic follow-up.

Conclusion.

In patients with arterial hypertension, post-COVID-19 cerebral ischemic changes may be associated with deterioration of cognitive function. The presented findings suggest that patients with MRI-confirmed ischemic changes have a higher frequency of cognitive impairment, particularly affecting attention, memory, and executive functions. Integration of regular cognitive screening with optimal blood pressure control and individualized neuropreventive interventions during the post-COVID-19 period may contribute to the early detection and prevention of progressive cognitive decline.

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