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INFECTION OF COVID-19 ON COGNITIVE FUNCTIONS

Tolibov Farrux Farxodivich
Asia International University, Bukhara, Uzbekistan

Annotation: *The new coronavirus disease, identified in 2019, has been spreading around the world for 4 years, and the risk of infection and death from this infection remains high. People infected with COVID-19 can develop a variety of sequelae and complications that affect different organs and systems and last from weeks to months after initial recovery. In people who have recovered from COVID-19, various consequences and complications can appear not only in adults and the elderly, but also in young people. Both in the acute period of the disease of COVID-19 and in the short and long-term observation period of patients, individual neurological symptoms and syndromes are observed.*

Keywords: *COVID-19, Coronavirus, Neurological manifestations , Cognitive impairment, Neuropsychology.*

To date, there are many observations describing the neurological manifestations of COVID-19. Common symptoms include severe fatigue, shortness of breath, headache, muscle and/or joint pain, memory loss, chest tightness, fast heart rate, nausea, mood swings. change and the difficulty of physical exercise. But most of these symptoms are also observed in various viral and non-viral infections. A recent meta-analysis identified a total of 55 symptoms that persist in humans after acute coronavirus infection. The five most common symptoms were (58%), headache (44%), lack of concentration (27%), hair loss (25%), and shortness of breath (24%). Cognitive disorders were detected in 1/3 of patients.

Initially, COVID-19 was considered a disease affecting the respiratory system. However, accumulated clinical material indicates that possible targets for the SARS-CoV-2 virus may be and other organs and systems. This is due to the fact that the receptors ACE2 is expressed not only in epithelial cells type II alveoli, but also in other types of cells in various organs and tissues, including endothelial cells and pericytes. The expression of ACE2 receptors in different structures and parts of the brain [7]. These circumstances explain the possibility of involvement of different organs and systems with the development of multiple organ damage and various neurological complications. According to M. Heneka et al, in the acute period of COVID -19, more than 1/3 patients develop neurological symptoms, of which 25% can be attributed to direct damage to the central nervous system. Most often, all these complications arise due to the penetration of the virus into the systemic bloodstream, its dissemination and damage to the endothelium of the vascular bed.

The elderly are particularly affected by COVID-19. In recent years, systemic inflammation has been shown to contribute to the development of cognitive decline and neurodegenerative diseases in survivors of COVID-19. The most common clinical manifestation of COVID-19 is the development of acute respiratory distress syndrome (ARDS), which is closely related to decreased cognitive functions and quality of life, along with impaired respiratory function of the lungs. This syndrome can often persist for months or years after hospital discharge .

The majority of patients with severe O`RDS, a major feature of severe COVID-19 disease, experience impairments in memory, attention, or rapid thinking within 1 year. Cognitive impairment was observed in 70-100% of patients after hospital discharge, 46-80% within 1 year, and 20% within 3 years.

Cerebrovascular injury is a serious complication of severe COVID-19. It can cause long-term brain damage, and vascular damage can increase the risk of cognitive impairment.

Viral infections are very common, some of which are known to affect the central nervous system, causing neuropsychiatric syndromes, cognitive, affective and behavioral disturbances.

Rehabilitation of patients with neurological manifestations of coronavirus infection, including stroke survivors, is currently considered urgent. Due to the fact that this disease is still a new disease in the medical community, there is not enough time and experience to develop special methods and rehabilitation standards to effectively and safely restore the impaired functions of patients infected with COVID-19 at each stage. Obviously, the medical rehabilitation system should be comprehensive and include both drugs and non-drug methods. Cognitive rehabilitation is used to restore damaged cognitive functions, which includes measures aimed at restoring damaged cognitive functions and improving the cognitive field in general, as well as compensatory (adaptive) strategies that allow performing tasks using intact functions. Therefore, a comprehensive approach with the use of drug and non-drug treatment methods is of great importance. Treatment of patients should be individualized, taking into account pathogenetic factors and limiting risk factors (smoking, alcohol abuse, low physical activity, obesity) and aimed at treating arterial hypertension, diabetes and other diseases. One of the areas of treatment of cognitive disorders is neuroprotection.

Neuroprotection is a strategy or combination of strategies that prevent or slow down damage to brain tissue and promote neuronal recovery. It is believed that the use of drugs that contribute to the normalization of metabolism in the brain with neurotrophic and neuroprotective effects can be important in therapeutic tactics. Improvement of blood circulation in the system of small cerebral vessels can also be achieved with the help of drugs that restore endothelial function and microcirculation-improving agents.

CONCLUSION: Thus, the COVID-19 pandemic has become a major problem worldwide since its onset in December 2019. Despite respiratory distress being the most common symptom, patients with COVID-19 also have significant neurological impairment. COVID-19 can cause acute and chronic neurological problems, including cognitive impairment, that can develop at different times from the onset of the disease and last a lifetime. It should be noted that the neurological manifestations of the new coronavirus infection have not been fully studied and require careful analysis. It is not known whether they are short-term or can develop into chronic diseases. It is also unclear how quickly damaged brain matter can be repaired. Observation of patients with neurological pathology, dynamic monitoring of recovered patients should be taken into account.

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