



CLINICAL AND PATHOGENETIC STRUCTURE OF NEUROPSYCHOLOGICAL SYNDROMES IN COVID-19 DEPENDING ON GENDER DIFFERENCES

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Abstract

Currently, the world community is faced with a new infectious disease that has not only medical, but also enormous socio-economic significance - the COVID-19 pandemic. (coronavirus disease 2019). The article discusses brief etiopathogenetic aspects of the new coronavirus infection. The role of some of the factors contributing to the development of nephro- and cerebrovascular disorders in COVID-19 is discussed. Results of work on coronavirus infection summarized foreign researchers.

Keywords: COVID-19 pandemic, SARS-CoV-2, rehabilitation, recommendations, intracerebral, predominant.

While the exact cause of this discrepancy is unknown, researchers have proposed various options for why this virus, known as SARS-CoV-2, affects women and men differently. Some potential causes surround social determinants of health, such as smoking or wearing a mask to prevent infections. Others are related to biological factors arising from extensive previous studies that have demonstrated significant differences in the immune systems of women and men. [13], hormonal levels of women are also of great importance. In addition, if we look at the socio-economic impact of the response measures taken to contain the rapid spread of the virus: the closure of schools and other social facilities, as well as limited access to health care after a pandemic, can also affect gender and possibly exaggerate existing gender inequalities. The 2019 SARS-CoV-2 coronavirus (COVID-19) pandemic has already affected more than 3.5 million patients worldwide by early May, changing the pace of the planet in recent months. COVID-19 poses a global health threat. In some patients with COVID-19, neurological manifestations, including stroke, were detected. J. Helms et al reported neurological signs in approximately 84% of patients with COVID-19 [1]. Headache, dizziness and altered level of consciousness were observed in 11%, 8% and 9% of patients with COVID-19, respectively [2]. Ischemic stroke (IS), intracerebral hemorrhage and thrombosis of the venous sinus of the brain have also been reported in patients with COVID-19 [3]. Early reports described a Chinese patient with COVID-19 with left-sided hemiparesis caused by ischemic stroke and occlusion of a large blood vessel [4], as well as a COVID-19 patient with massive





intracerebral hemorrhage with no prior history of hypertension (AH) or anticoagulant use [5]. According to a study in China, in the period from January 27 to March 5, 2020, out of 1875 patients with COVID-19, 50 developed a stroke, and 5 (10%) had a hemorrhagic stroke (HI), and 45 (90%) had an ischemic stroke [6]. At the same time, there are limited data on the clinical characteristics, mechanisms of stroke development and outcomes in patients with stroke and COVID-19 [7].

Coronavirus Disease 2019 (COVID-19), with severe acute respiratory syndrome, caused a full-blown global pandemic in 2020. [ten]. According to the World Health Organization (WHO), there were 15 million confirmed cases of COVID by July 2020. -19, which includes more than six hundred thousand deaths [8]. At the same time, from a number of countries, in particular from China, Italy and the USA, reports were received indicating the difference in the effect of the disease depending on the sex of the patients. Thus, it was revealed that the disease affects men and women in different ways, both in terms of the outcome of the infection and the impact of the disease on society. [4].

Consequently, it has been found that men are more severely ill and die from the disease more often than women, and mortality can be 20 percent higher. The highest risk of death in men from COVID. -19, fell on the age of 50. In China, deaths from COVID. -19 for men was 2.8%, for women - 1.7%. [Gupta, Alisha Haridasani, 2020]. In Europe, 57% of those infected and 72% of deaths from COVID-19 were male patients.

Despite this, the incidence of the virus slightly differs in the sexual aspect, amounting to a ratio of 1, 0.9. [12]. The reasons for this gender difference are unknown, but genetic, immunological, hormonal, social, behavioral factors are considered significant [11].

Along with this, COVID-19 has led to a number of neuropsychological disorders: an upsurge in suicide [3], anxiety [2] and depression. It is not known whether these effects are caused by fear of illness, social isolation, unemployment, economic burden, exacerbation of existing conditions, or biological changes in the brain [5]. At the same time, mental disorders are represented by cognitive, somatized disorders of anxiety-phobic (8.5–28.8%) and depressive (9.5–16.5%) spectrum [6], their causes are distress associated with the disease, isolation, stay in the intensive care unit, intensive care unit, development of complications, fear of death. Low stress resistance, demoralization, awareness of the incurability of the disease can lead to suicide [9]. According to a systematic review [10], neurological disorders that can occur before the onset of symptoms of infection and in subsequent periods of the course of the disease are detected in 25% of patients and require emergency care. These include



agitation, panic attacks, confusion, psychomotor agitation, disorientation, delirium, somnolence, stunning, stupor, coma, epileptic seizures, and cerebral dysgемias [7]. Thus, the role of gender in the development of the disease, its course, and outcome determine the importance of taking this parameter into account in the diagnosis, administration and prevention of complications.

In this regard, the presence of a sufficiently large sample of cases that have already been registered in our region is a prerequisite for a deeper and more comprehensive study of all the most important aspects of this phenomenon associated with COVID-19. All this determines the high relevance and urgency of the chosen scientific topic. the goals and tasks set by the applicant for achieving and fulfilling them in the future will fully reveal the selected problem.

It has now been shown that neurological symptoms are more common in patients with severe infection who develop ischemic stroke, GI, and encephalopathy [8]. Thus, among 214 patients hospitalized in Wuhan (China), 78 patients had neurological symptoms [8]. Cerebrovascular disease was observed in 6 (2.8%) patients and was more common in more severe disease (5 out of 6 patients). J. Helms et al. investigated 58 patients with COVID19, of which 13 underwent MRI of the brain, ischemic stroke developed in 3 of 13 patients (23%) [1]. Li Y et al. reported that of 221 patients with COVID-19, 11 (5%) had acute IS, 1 (0.5%) had venous sinus thrombosis, and 1 (0.5%) had intracerebral hemorrhage [9].

Among hospitalized patients with COVID-19, IS was the most common and was more common in the elderly and middle-aged people with vascular risk factors, with 38% of them dying [8, 9]. It was also noted that COVID-19 developed more often in people with vascular risk factors, and among them there was a higher mortality rate [10]. In a recent meta-analysis of 76,993 COVID-19 patients [11], the overall prevalence of hypertension, cardiovascular disease, history of smoking and diabetes mellitus (DM) was estimated at 16.37% (95% CI: 10.15-23.65 %), 12.11% (95% CI 4.40-22.75%), 7.63% (95% CI 3.83-12.43%) and 7.87% of cases (95% CI 6, 57-9.28%), respectively. Another systematic review also found hypertension and diabetes mellitus as the predominant comorbidities [12].

A retrospective cohort study of patients with ischemic stroke who were admitted to hospital between March 15 and April 19, 2020 [7] was conducted in New York. During the study period, of 3556 hospitalized patients with COVID-19, 32 patients (0.9%) had visually confirmed ischemic stroke. Out of 32 patients, stroke was the cause of hospitalization in 43.8%, symptoms of COVID-19 were the cause of hospitalization in 56.2%, while the stroke developed during hospitalization. The average age of 32 patients with COVID-19 and stroke was 62.5 (52.0-69.25) years, 71.9% (23/32) were





men. In 65.6% of patients (21/32), the cryptogenic subtype of ischemic stroke was diagnosed, and 34.4% (11/32) met the criteria for embolic stroke of undetermined source. The average time from the first symptoms of COVID-19 to the detection of a stroke averaged 10 (5-16.5) days. The most prominent clinical manifestations were cough (84.4%), fever (71.9%) and hypoxia (78.1%). At the last follow-up, 81.3% of patients (26/32) met the criteria of a severe illness, while 75.0% of them (24/32) died or were seriously ill. The mean pre-stroke D-dimer level was 3913 ng / ml (2549-10,000), and the mean C-reactive protein level was 101.1 ng / ml (38.8-214.3). Treatment prior to the onset of stroke symptoms / diagnosis included hydroxychloroquine (40.6%, n = 13), lopinavir / ritonavir (3.1%, n = 1), and tocilizumab (6.3%, n = 2). Based on the study, the authors concluded that compared with modern controls, patients with COVID-19 and stroke were younger (mean 63 years versus 70 years, $p = 0.001$), had a higher NIHSS score upon admission (mean NIHSS 19 versus 8 points, $p = 0.007$), higher peak D-dimer level (mean value: > 10,000 versus 525 ng / ml, $p = 0.011$), were more often treated with anticoagulants (78.1% versus 23.9%, $p < 0.001$), more often had the cryptogenic subtype of stroke (65.6% versus 30.4%, $p = 0.003$), there was a higher mortality rate in the hospital (63.6% versus 9.3%, $p < 0.001$) [7].

Epidemiological data on the incidence of stroke during the COVID-19 pandemic have not yet been published, but individual studies indicate an increase in the incidence of thrombotic stroke in young patients [13].

In the setting of COVID-19 infection, patients with vascular risk factors may have an increased risk of stroke [11, 14]. So, in Italy, out of 355 patients who died from COVID-19, 352 had concomitant diseases, including diabetes - in 35.5%, coronary heart disease - in 30%, atrial fibrillation - in 24.5% and stroke - in 9.6% [15].

Conclusion. Thus, the COVID-19 pandemic has put a huge strain on health systems. Patients with severe COVID-19 symptoms may also have acute cerebrovascular accidents. ischemic stroke in these patients may result from complications associated with COVID-19, or decompensation of previously asymptomatic cerebrovascular disorders, or due to the presence of common risk factors for stroke in COVID-19. The COVID-19 pandemic has had a huge impact on the management of neurological patients, whether they are infected or not, and has negatively impacted most stroke services around the world.





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