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CLINICAL SPECTRUM OF COGNITIVE DISORDERS

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Abstract: A retrospective cohort study was conducted on the results of a comprehensive examination and treatment of 87 patients with COVID-19. In patients at the time of hospitalization with COVID-19, all studied markers of coagulation activity were statistically significantly different from the reference interval, which indicated activation of the procoagulation potential. In the group of female patients, these indicators were more pronounced. A CT study found that the percentage of lesions in both lungs was significantly higher in females compared to male patients.

Key words: COVID-19, stroke, cerebral venous sinus thrombosis.

Relevance. In the new millennium, humanity was faced with infectious diseases that no one knew about. Plague and typhus were replaced by dangerous viruses. Environmental change, climate warming, increased population density and other factors provoke their appearance, and high migration activity of the population contributes to their spread throughout the world. Truly, infections know no borders. According to UN forecasts, by 2050 the world's population will reach 10 billion people. This means that the processes of migration and urbanization will accelerate even more [1]. The COVID-19 epidemic ("coronavirus disease 2019") has already gone down in history as an emergency of international significance. Currently, the number of infected people in the world has exceeded 470 thousand people [2]. We still have to study the features of this epidemic, learn lessons, and analyze the shortcomings of ensuring the biological safety of the population. One thing is clear: new viruses will appear, this is an integral part of our world. Humanity must learn to counter these threats.

The new coronavirus infection COVID-19, caused by the coronavirus SARS-CoV-2, poses a global health threat. Neurological disorders found in patients with coronavirus infection have a wide range of clinical signs: headache, dizziness, altered level of consciousness, acute cerebrovascular accident (ACVA), cerebral venous sinus thrombosis [1,4,8,9,10,11,21,22].

Patients with major non-infectious diseases, namely acute cerebrovascular accidents (stroke, hypertensive cerebral crises, transient ischemic attacks), arterial hypertension, myocardial infarction, diabetes mellitus, chronic respiratory diseases (COPD), oncological, mental diseases, according to leading organizations, as the American Heart Association, the World Stroke Organization, the European Stroke Organization, are now at risk of inadequately receiving immediate medical care for specialized pathologies, as well as on the incidence of complications in case of infection with COVID-19 [2,5,12,13,14,15,16,17,23]. There is growing evidence that people with COVID-19 suffer from cognitive impairment. American scientists have found that the spike protein of the SARS-CoV-2 coronavirus can penetrate the brain, breaking the blood-brain barrier. The authors see this as the reason for changes in the brain during COVID-19. The study results were published in the journal Nature Neuroscience. According to the authors, this convincingly indicates that the SARS-CoV-2 virus itself, which causes COVID-19, can penetrate the brain [2,3,6,7,18,19,20].

Analysis of information from the UK Biobank on 431,051 patients showed that only one risk factor How COVID-19 infections are statistically significant is reduced cognitive functions

[13]. However, the reasons and mechanisms of such correlation are still are not clear. In older patients with dementia, COVID-19 may may debut with atypical psychopathological symptoms - anxiety, agitation, disorientation, delirium, refusal to help, loss of appetite [14–16]. Atypical symptoms in patients with dementia may slow down the process of making a correct diagnosis, and then consequently, increase the risk of complications and death. A UK-based observational study including 125 inpatients with COVID-19, has demonstrated unusual symptoms infectious disease. In 6 patients after infection COVID-19 developed neurological symptoms in the form of a “cognitive disorder similar to dementia” her" [17].

In the context of the spread of COVID-19, it is important to remember that unexplained encephalopathy, memory impairment, depression, apathy, symptoms of damage to the peripheral nervous system and muscles should be interpreted as possible manifestations of a new coronavirus infection. Given the large number of people infected with SARS-CoV-2, a relative increase in the frequency of autoimmune lesions of the nervous system in the near future cannot be ruled out.

Further research in this direction is needed. All of the above shows the relevance of the problem and the advisability of studying it in the clinic.

Purpose of the study: To study psycho-emotional disorders in young patients who have suffered coronavirus infection.

Material and methods. In accordance with the purpose and objectives, the study included 87 young patients aged 18 to 44 years (average age 31.9 ± 12.1 years) with post-Covid syndrome (PCS) (Fig. 1). The patients were divided into two groups: group I consisted of 36 women (41.4%), group II 51 men (58.6%), the gender index was 1.4:1.0. The control group (CG) included healthy individuals comparable to those in the main group in terms of gender and age characteristics ($n=20$; average age 32.4 ± 7.3 years; gender index 1.0:1.2).

Research results and discussion. The distribution of patients depending on the severity of the coronavirus infection is shown in Table 1. As for the distribution of the severity of coronavirus infection (CVI) in groups, the table shows that in the group of men there were more patients with a moderate-severe course, and the proportion was also significantly higher severe form of CVI compared with women. Thus, in group I, a history of mild severity of COVID-19 was diagnosed in 17 (47.2%) patients, moderate severity in 15 (41.7%) patients, and severe severity in 4 (11.1%) patients. In group II, there were significantly more patients with moderate to severe severity – 27 (52.9%) and severe – 9 (14.9%) compared to group I.

All patients had symptoms of intoxication, so a diffuse headache was characterized as “pressing” in 67 (77.0%) and “bursting” in 21.9% of patients. (% was calculated from the total number of patients studied, if the overall indicator is considered, if the indicator is considered within a group, then % is calculated in relation to the number of patients in the corresponding group).

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The structure of clinical manifestations during the acute period of the disease in the examined patients is shown in the table. As can be seen from this table and the figure, in general,

patients were more likely to have mild ARVI and pneumonia without acute respiratory failure (ARF) - 92.0%. Mild acute respiratory viral infections and pneumonia without acute respiratory failure (ARF) were more common in women compared to female patients.

The average number of comorbidities per hospitalized patient was 3.6 ± 0.9 . We have established the dependence of the average number of concomitant diseases among patients with PCS on the gender and age of the patients. Among the comorbid conditions was metabolic syndrome (MS). When examining body mass index (BMI) in patients, it was found that in women it averaged 31.2 - this is significantly lower than BMI in men; the average value in men was 26.3 ($p < 0.05$).

These indicators were also not monitored before patients were discharged. For a more detailed study of the state of the hemostatic system, based on the main goal of our work, an analysis of both screening indicators and more accurate markers of the state of hypercoagulation and endothelial dysfunction was carried out.

Thus, in the acute period of the disease, women had significantly lower hemoglobin content (92.8 ± 10.3 g/l versus 112.4 ± 11.5 g/l, $p < 0.005$), relative number of leukocytes ($3.6 \pm 0.9/L$ vs. $4.8 \pm 1.2/L$, $p < 0.01$). Based on the coagulogram indicators, it can be concluded that in men the hypercoagulative mechanisms of the hemostatic system predominated.

Asthenic disorders in the examined patients with PCS were determined by points of the MFI-20 scale - "decreased motivation", "mental asthenia", "reduced activity", "physical asthenia" and "general asthenia".

The changes in the brain that we identified during the MRI study included: expansion of the perivascular spaces of Virchow-Robin, foci of damage in the white matter of the cerebral hemispheres, expansion of the subarachnoid spaces, expansion of the ventricles of the brain (Table 6). Single ($< 3\text{mm}$) lesions of ACL were noted in 7 patients (19.7%) in the group of women; in the group of male patients there were significantly more of them - in 11 (21.6%). Multiple foci of white matter damage in the cerebral hemispheres were significantly more often detected in male patients (29 people, 56.9%) than in the group of female patients (17 people, 47.2%). Expansion of perivascular spaces was detected in 24 patients (47.1%) in males, which is significantly higher than the same indicator in female patients - in 15 (41.7%) people. The pathogenesis of the expansion of perivascular Virchow-Robin spaces in patients with ACL can be explained by a massive process of vascular demyelination followed by white matter atrophy.

A retrospective study was conducted in Chicago (USA) study included 50 patients (average age) age - 59.6 ± 14.3 years), hospitalized with COVID-19 and neurological symptoms [18]. In 40% of cases there were cerebrovascular diseases diagnosed (CVD): ischemic stroke (20%), intracerebral hemorrhage (8%), subarachnoid hemorrhage (8%), transient ischemic attack (4%). In 24% of patients epileptic seizures developed, after which headaches and short-term disturbances in pain wrinkle. It is important to note that among the patients included

into the study, such concomitant diseases such as arterial hypertension (AH; 60% of cases) teas), type 2 diabetes mellitus (60%), obesity (42%).

The authors reported that neurological symptoms in one these patients may be the first manifestations COVID-19, and in others - complications of COVID-19, developing occurring more than 24 hours after diagnosis infectious disease. According to the results of the study research held in Wuhan (China) and included 214 patients, neurological symptoms were observed in 36.4% of hospitalized patients with COVID-19 [19].

In most cases, neurological symptoms were associated with damage to the central nervous system (CNS). In severe pneumonia, neurological symptoms complications and complications were more common than with non-severe pneumonia (45.5% vs. 30.2%; $p=0.02$). According to a number of studies in older patients with COVID-19, CNS damage was more common than in patients of other age groups [1]. It is known that resuffered strokes can cause a decrease in native functions, a factor in the development or deterioration vascular, degenerative and mixed CIs.

Conclusions: In patients at the time of hospitalization with COVID-19, all studied markers of coagulation activity were statistically significantly different from the reference interval, which indicated activation of the procoagulation potential. In the group of female patients, these indicators were more pronounced. A CT study found that the percentage of lesions in both lungs was significantly higher in females compared to male patients.

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