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COVID-19 AND PARKINSON'S DISEASE

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ANNOTATION

The aim of our study was to study the course of Parkinson's disease in patients who had undergone coronavirus infection. The comparative analysis of motor and non-motor disorders in Parkinson's disease is planned.

Key words: COVID-19, Parkinson's disease, motor and non-motor disorders

Today, the coronavirus infection (COVID-19) in the form of a pandemic is a very urgent problem that has shaken the population of all countries of the world. It caused the death of many patients, aggravated the course of certain diseases in some patients, increased disability and, in this regard, stabilized severe socio-economic problems [19,20-23]. COVID-19 infection strongly affected the central nervous system as well as all systems of the body, including cerebrovascular diseases, peripheral nervous system diseases, epilepsy and neurodegenerative diseases. It also led to the development of parkinsonism as a risk factor. And in patients with Parkinson's disease (PD), it accelerated the course of the disease and stabilized the disability [3,4,5,6,7,8,18].

The link between Covid-19 and Parkinsonism may be due to a number of factors. Scientists are conducting various discussions on this matter.

There are several factors that affect the development of Parkinson's disease after the coronavirus. However, these factors cannot always fully prove the development of the disease. That's why there are a number of theories that promote the development of the disease: 1. Virus theory. The coronavirus specifically affects the CNS, causing inflammation and accelerating the neurodegenerative process, including Parkinson's disease; 2. Immunological theory. After the virus enters the body, the autoimmune process accelerates, a number of dopaminergic neurons are injured, which can trigger the development of PK; 3. Theory of mental strain. Post-coronavirus mental stress exacerbates PD reactivity and symptoms begin to emerge [1,2,5].

Patients with Parkinson's disease on the background of COVID-19 develop somatic diseases, including cardiovascular diseases, diseases of the respiratory system, diseases of the digestive system and urinary system. Acute decompensation of Parkinson's disease, that is, as a result of sudden exacerbation of symptoms of the disease, limitation of movement activity and these symptoms persist for up to 24 hours, may be affected by COVID-19 infection. In 4-10% of cases, severe decompensation may develop and end with death. The main cause of death is obvious vegetative disorders and somatic diseases. These include cardiac pathology, aspiration pneumonia, pulmonary embolism, intestinal obstruction, renal failure, sepsis, DVS syndrome, and rhabdomyolysis. In the late stages of Parkinson's disease, difficulty in swallowing, difficulty

in breathing can lead to serious complications of infection with COVID-19. Taking into account the above, we set the following goal:

Aim. Evaluation of the effect of COVID-19 infection on motor disorders in patients with Parkinson's disease.

Research material and methods. During the study, 84 patients with general Parkinson's disease (43 men – 51,2 % and 41 women – 48,8%) were examined. We divided the collected patients into 2 groups. Group 1- 51 patients (26 men and 25 women) with PD with COVID-19 infection and group 2- 33 patients (18 men and 15 women) with PD who did not suffer from COVID-19 infection. Patients who did not suffer from acute infectious or other serious diseases at least one month ago were included in this group. The total average age of patients in both groups, the total average duration of the disease, the onset of the disease, and the period after the infection of COVID-19 were calculated. The titer of interleukin-2 and interleukin-6, as well as immunoglobulins, was studied in the blood serum of 76 patients. Disease severity in patients with PD was evaluated using UPDRS-MDS 2007. This scale is studied in 4 parts: 1. Non-motor aspects of everyday life, 0-52 score on 13 points, a score of 10 and below - mild, 22 points and above - severe level; 2. Motor aspects of daily life, 0-52 score on 13 points, a score of 12 and below - mild, a score of 30 and above is severe; 3. Examination of movement functions, 0-132 score on 18 points, 32 or less score - mild level, 59 or more score - severe level; 4. Motor complications, 0-24 score on 6 points, a score of 4 and below is mild, and a score of 13 and above is severe.

Research results. In the first stages of our research, we made a comparative analysis of both groups according to the clinical forms of the disease. The obtained results show that 11 patients (13,1%) had the akinetic-rigid form of the disease in group 1, i.e. patients who had the coronavirus, 16 people (19,0%) have tremor and the mixed form of the disease was found in 17 (20,2%) patients. 15 (17,9%) of PD patients in group 2, i.e., patients with PD who did not transmit the coronavirus, had the akinetic-rigid form of the disease, tremor form 13 (15,5%) and mixed form was found in 12 (14,3%) patients. We know that Parkinson's disease changes its clinical form with relapse, that is, it transforms. Mixed tremors and mixed forms of the disease are relatively more severe forms.

In the next phase of the study, we compared the stages of the disease in both groups according to Xen and Yar. 10 patients (12,0%) had stage 1 of the first coronavirus infection. Stage 2 -14 people (17,0%) and stage 3 - 15 (18,0%) and stage 4 occurred in 4 (4,8%) patients, 12 (14,2%) of stage 1 patients who did not undergo coronavirus treatment in group 2, Stage 2- 16 people (19,0%) and stage 3 occurred in 13 (15,0%) patients, in this group there were no patients with stage 4 PD. Stages according to Hen and Yar indicate the degree of severity of the disease,

(1-5) - along the series of stages, the condition of patients becomes worse, the patients need help from others, and the cases of disability increase.

In the next step, we compared the results of the UPDRS scale in both groups of patients. When comparing non-motor aspects of daily life by 13 points, it was $29,8 \pm 2,7$ score in patients with coronavirus in group 1, the patients in group 2 had $8,9 \pm 3,1$ score, $p \leq 0.001$. Severe cases of PD in patients with coronavirus, while patients with PD who did not transmit coronavirus showed mild disease severity levels. When comparing nonmotor manifestations, severe cognitive impairment in patients with coronavirus, mild behavioral disorders, moderate and severe depression, severe anxiety, moderate apathy, emergence of mild and moderate dopamine dysregulation syndrome, severe sleep disorders, moderate daytime sleepiness, pronounced pain and sensory disturbances, mild and moderate urinary incontinence, severe constipation, It was manifested by light and moderate dizziness, severe fatigue.

The results of the UPDRS scale in both groups of patients were analyzed according to 13 indicators of point 2. When comparing the motor aspects of daily life according to 13 points, $36,7 \pm 4,4$ scores in group 1 coronavirus patients and in patients who did not transmit coronavirus in group 2, it was $13,6 \pm 4,3$ score, $p \leq 0,001$. Moderate speech impairment, moderate drooling, mild to moderate eating problems, and mild to moderate eating problems in post-Covid-19 patients with PD, moderate dressing disorders, moderate personal hygiene problems, severe mood disorders, moderate disturbances in hobbies and other activities, moderate tossing and turning problems in bed, severe tremors, moderate difficulty getting out of bed, getting into a car, and sitting in a deep chair, severe walking and balance problems, moderate stiffness appeared with visual disturbances.

At the next stage of the study, we analyzed the indicators of movement disorders according to the 3rd point of the UPDRS scale. It was $48,4 \pm 10,3$ score in patients of group 1 who underwent COVID-19, In patients in group 2, this indicator was $26,7 \pm 9,3$ score the level of reliability was high, $p \leq 0,05$. Moderate-to-severe speech disorders, moderate-to-severe facial dysmorphism, moderate-to-severe rigidity, moderate-to-severe finger-pressing disorders, moderate violations in the level paw, moderate to severe paw pronation and supination disorders, moderate toe strike disorders, moderate to severe foot mobility disorders, severe chair rising disorders, severe walking blindness disfigurement, moderate gait stiffness, severe postural instability, moderate standing disorder, mild to moderate bradykinesia, postural tremor of the hand moderate and severe, manifested by disturbances in the form of moderate kinetic hand tremor, moderate resting tremor amplitude disturbance, moderate persistent resting tremor.

At the next stage, 6 indicators were compared according to the 4th point of the UPDRS scale. In patients of group 1, it was $16,8 \pm 5,4$ score, In patients in group 2, this indicator was 4,6

± 4,7 points, the level of reliability was high, $p \leq 0,001$. At this stage, motor complications were compared and impairments associated with the duration of severe dyskinesias, impairments associated with the functional effects of moderate dyskinesias, moderate and severe fluctuation, “off ” problems, moderate and severe fluctuating functional impact disorders, severe complex motor fluctuating problems, moderate and severe painful dystonia Related problems are manifested by visual disturbances.

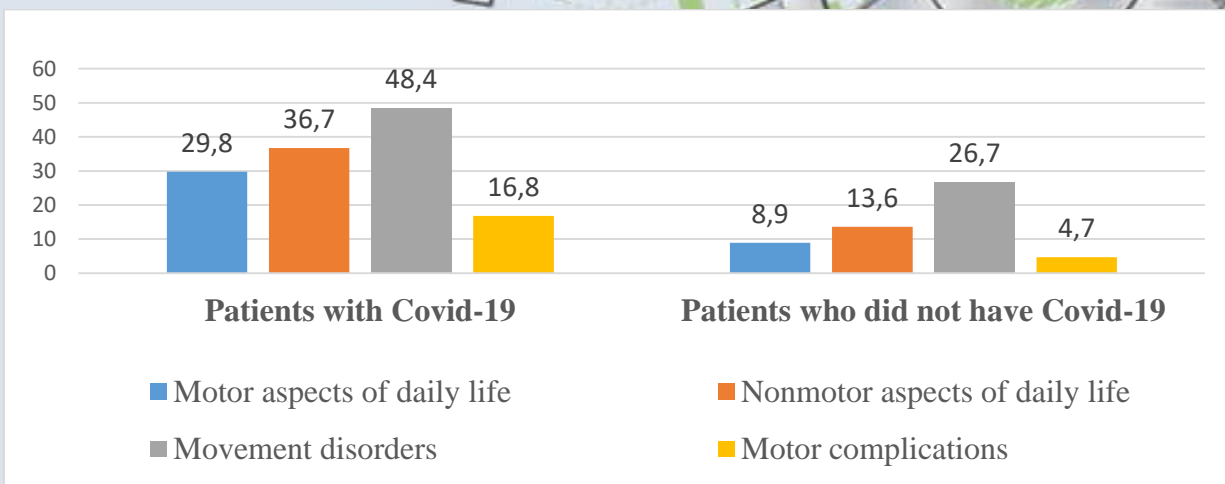


Figure 1. Severity of disease in PD patients with and without COVID-19

Severity of disease in group 1 PK patients with COVID-19 and group 2 PK patients without Covid-19 were compared by 4 time points and the data are presented in Figure 1 .

Conclusions.

1. Covid-19 affects the clinical course of Parkinson's disease depending on the clinical forms of the disease, causing rapid transformation from akinetic-rigid form to tremor-mixed forms.

2. Covid-19 affects the clinical course of Parkinson's disease depending on the stages and aggravates the symptoms in a short period of time from the initial stages to the advanced stages.

3. If the disorders identified as a result of the timely assessment of the clinical course of Parkinson's disease in patients with Covid-19 are eliminated in time, the quality of life of patients will improve and the state of disability will be reduced.

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