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Vascular parkinsonism after a stroke during the COVID-19 pandemic: A case report

COVID-19 pandemisi sırasında gelişen inme sonrası vasküler parkinsonizm: Olgu sunumu

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ABSTRACT

Parkinson disease is the second most common neurodegenerative disease in the world after Alzheimer disease. Vascular parkinsonism is one of the causes of secondary parkinsonism. Vascular parkinsonism, a condition in which one or more major symptoms such as tremor, bradykinesia, rigidity, and postural instability are observed together, develops due to vascular pathologies, and there are still no definitive criteria for diagnosis. In cases of vascular parkinsonism, a personalized rehabilitation program should be implemented. Herein, we reported a 64-year-old female patient who developed vascular parkinsonism secondary to a cerebrovascular accident following COVID-19 infection.

Keywords: COVID-19, Parkinson, rehabilitation.

ÖZ

Parkinson hastalığı dünyada Alzheimer hastalığından sonra en sık görülen ikinci nörodejeneratif hastalıktır. Vasküler parkinsonizm ise sekonder parkinsonizmin nedenlerindendir. Vasküler parkinsonizm tremor, bradikinezi, rijidite ve postural instabilite gibi majör semptomların bir veya daha fazlasının bir arada görüldüğü bir tablo olup vasküler patolojiler nedeniyle gelişir ve tanısında halen kesin kriterler mevcut değildir. Vasküler parkinsonizm olgularında kişiye özel rehabilitasyon programı düzenlenmelidir. Burada, COVID-19 enfeksiyonu sonrasında serebrovasküler olaya sekonder vasküler parkinsonizm geliştiren 64 yaşında bir kadın hasta sunuldu.

Anahtar Sözcükler: COVID-19, Parkinson, rehabilitasyon.

Parkinsonism is a clinical syndrome characterized by tremor, rigidity, bradykinesia, akinesia, and postural abnormalities. Vascular parkinsonism (VP) is a combination of one or more of the major symptoms such as tremor, bradykinesia, rigidity, and postural instability and is caused by vascular pathologies. Bradykinesia and rigidity are common in the disease, while resting tremor is less common. The response to medical treatment is generally

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poor, and an individualized rehabilitation program should be designed.[1] This case report aimed to draw attention to the clinical findings of VP that developed after a stroke during the COVID-19 (coronavirus disease 2019) pandemic and to emphasize that medical treatment is insufficient, with better results obtained through individualized rehabilitation programs.

CASE REPORT

A 64-year-old female patient was admitted to the emergency department with right-sided weakness, urinary incontinence, and confusion. At the time of presentation to the emergency department, the Glasgow Coma Scale score was 5, pupils were isochoric, light reflex was positive bilaterally, and the pull response in the left arm to painful stimuli was positive. The patient was found to have high blood pressure, and antihypertensive treatment was started. Computed tomography, which was performed with a presumptive diagnosis of stroke, showed hematoma in the left thalamus and edema in its neighborhood. The patient was discharged after eight days of intensive care treatment. In the second month of illness, the patient applied to our physical medicine and rehabilitation outpatient clinic and was admitted to our clinic. Written informed consent was obtained from patient.

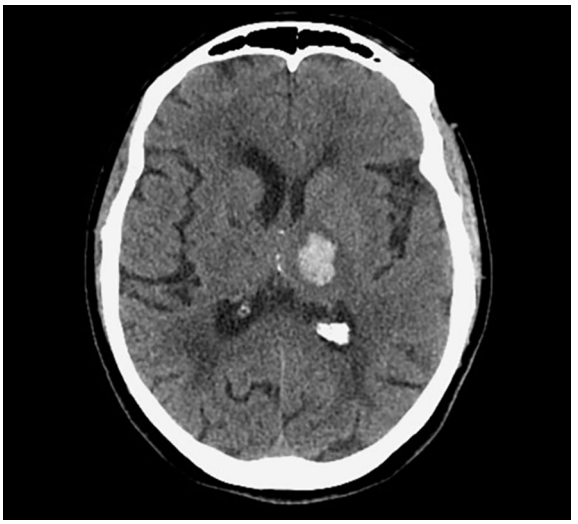

Figure 1. *Brain computed tomography showing a 2×1.5-cm hematoma in the left thalamus.*

On physical examination, the general condition was good, consciousness was clear, cooperation was poor, and orientation was moderate. Fine motor skills of upper and lower extremities were complete, deep and superficial sensation was normal, and deep tendon reflexes were normoactive. The patient had no spasticity or pathologic reflexes. The swallowing reflex was present, and there was no facial paralysis. The Functional Ambulation Scale score was 2. Speech was slowed, and the patient had difficulty initiating walking and walked with short steps. She could turn in bed and sit without support. Postural instability was present, and the Rhomberg test was negative. The patient had bradykinesia and freezing phenomenon. There was no cogwheel phenomenon or rigidity. The Mini-Mental State Examination score was 9.

A rehabilitation program with emphasis on gait and balance training was organized for the patient, who had slowed speech, difficulty initiating walking, and short-stepped gait following a stroke. During the course of the rehabilitation program, it was noted that the patient did not exhibit typical hemiplegic findings seen after stroke; instead, the clinical picture was more consistent with parkinsonian features. Based on these findings, the patient was referred to the neurology department with a presumptive diagnosis of vascular parkinsonism (VP). In the 8th week of the rehabilitation program, a definitive diagnosis of VP was made by Neurology, and medical treatment was initiated. The rehabilitation program was subsequently revised in accordance with the updated diagnosis and clinical presentation.

Joint range of motion and stretching, strengthening, posture, respiratory exercises, balance training, and verbal, tactile, and auditory stimuli in the form of metronome, marching rhythm, and hand clapping were given for the lower and upper extremities.

A rehabilitation program was given for a total of 10 weeks, with sessions lasting 60 to 90 min, five days a week. After physical therapy and medical treatment, the patient's

balance improved, and the time to initiate movement shortened. Functional ambulation scale increased from 2 to 4. The patient, whose communication and cooperation improved significantly, was discharged with a home exercise program for activities of daily living (e.g., turning keys, buttoning buttons, and squeezing balls) and recommendations for home organization. The follow-up and treatment of the patient continues with outpatient clinic visits.

DISCUSSION

Parkinson disease (PD) is the second most common neurodegenerative disease in the world after Alzheimer disease.[2] Parkinson disease is caused by neuronal degeneration of dopamine-secreting cells in the substantia nigra pars compacta in the brainstem. It affects approximately 1 to 2% of adults over 65 years of age and 4% of adults over 80 years of age.[2] Typically, PD is a disease of middle and old age, beginning at an average age of 50 to 60 years and progressing progressively over a period of approximately 10 to 20 years. Parkinson disease is more common in males than in females, and in individuals of European descent than in African American and Asian populations.[3] Parkinsonism is divided into four groups according to its etiology. Approximately 77% of parkinsonism cases are primary parkinsonism, 12.2% are Parkinson-plus syndromes, 8.2% are secondary parkinsonism, and 0.6% are hereditary parkinsonism syndromes. Among secondary parkinsonism, vascular and drug-induced parkinsonism are the most common.

Parkinsonism is a clinical syndrome characterized by tremor, rigidity, bradykinesia, akinesia, and postural abnormalities. Parkinson disease is the most common variant of parkinsonism and is the second most common presentation of movement disorders after essential tremor. Vascular parkinsonism is characterized by a combination of one or more of major symptoms such as tremor, bradykinesia, rigidity, and postural instability and develops due to vascular pathologies. It frequently affects the lower extremities.[1] Unlike primary parkinsonism, sudden freezing during gait and postural instability are present from the time of diagnosis.[4] Resting tremor is less common in the disease in which bradykinesia and rigidity are common. Anteflexion posture is usually not observed until the advanced stages of the disease. Since the findings of the disease usually show asymmetry and different rehabilitation and medical treatment is required, differential diagnosis with primary parkinsonism is necessary. In PD, medical treatment has an important role in addition to rehabilitation program, and a low response rate of 25% to medical treatment is observed in VP.[5] In a study by Zijlmans et al.,[6] it was found that 15 of 20 VP patients with lesions in or near the nigrostriatal pathway (putamen, caudate nucleus, and globus pallidus) responded to levodopa, while 14 VP patients without lesions in or near the nigrostriatal pathway did not respond to levodopa.

In a study by Borrione et al.,[2] it was found that rehabilitation approaches applied in addition to medical treatment in VP played an important role in the improvement of all motor symptoms of parkinsonism. Rehabilitation is the most effective nonpharmacologic treatment for PD. Although there is no specific exercise protocol, rehabilitation programs are usually designed according to the clinical experience of each physician and the needs of the patient. There is no consensus in the literature regarding the exercise programs to be applied.[7] A physical therapy protocol should last at least eight to 10 weeks for optimal benefit. Ideally, patients should exercise three days a week with sessions lasting 60 to 75 min. In a study by Çağlar et al.,[8] patients were given an intensive rehabilitation program for eight weeks, seven days a week, one session a day. At the end of the study, they reported that professionally organized home-based rehabilitation programs in the exercise group helped to improve the motor performance of patients with PD. There are different opinions about the duration of the rehabilitation program. We organized

a rehabilitation program with a session interval of 60 to 90 min, five days a week, with a focus on balance-coordination and gait training. After a 10-week rehabilitation program, the patient's balance improved, the time to initiate movement shortened, and the Functional Ambulation Scale score increased from 2 to 4.

Vascular-induced movement disorders after COVID-19 have been rarely reported in the literature. There is a case report of a patient who presented with acute hypokinetic-rigid syndrome characterized by parkinsonian symptoms such as generalized myoclonus, resting and postural tremor, rigidity, and bradykinesia, and who recovered spontaneously without treatment.[9] In another case report, a patient was diagnosed with PD after COVID-19 infection.[10] On examination, hypomimia, hypophonic speech, bradykinesia, and cogwheel rigidity were detected.[10]

In conclusion, this case draws attention to the clinical findings of VP that developed after a stroke during the COVID-19 pandemic. Since medical treatment alone is insufficient, an appropriate exercise program should be prepared by prioritizing the personal needs of the patient.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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