



COVID-19 infection presented as severe dyskinesia in a patient with Parkinson's disease: a case with daily video recording

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The impact of the current coronavirus disease 2019 (COVID-19) infection on motor complications of Parkinson's disease (PD) is not fully characterized. Deterioration of motor and non-motor symptoms was demonstrated in a limited number of studies (1, 2). However, increased daily *off* time and motor disability causing increase in dopaminergic therapy were reported in 30–50% of PD patients with COVID-19 infection, and severe dyskinesias causing decrease or cessation in dopaminergic therapy have not been reported yet. Here we present a patient with PD who had severe peak dose dyskinesias due to acute COVID-19 infection.

A 75-year-old man admitted to our outpatient clinic with complaints of sudden severe peak-dose dyskinesias and fatigue appeared in the last 3 days. He had 4-year history of PD with no other past medical history. He was fully independent in carrying out daily living activities and had no cognitive involvement. Hoehn and Yahr score was 3. He was suffering from motor fluctuations with motor *off* periods within 1 year; however, he did never experience dyskinesias before. He was treated with levodopa/benserazide 100/25 mg 6 × 1/day and pramipexole 3 mg/day. In his neurological examination, he had severe generalized dyskinesias (Video 1). The patient had generalized pain and intense fatigue. He was inclined to sleep and apathic. His skin was not sweaty, he had a dry mouth, and his body temperature was measured as 37.2 °C. Blood tests (biochemistry tests and hemogram) were within normal limits. Because of the COVID-19 outbreak, he was evaluated for COVID-19 infection and the diagnosis was performed according to the World Health Organization (WHO) criteria (3). The loading dose of 3200 mg/day favipiravir was administered on day 1 and

followed by a maintenance dose of 1200 mg/day for antiviral therapy (Table 1). All dopaminergic treatments were ceased and dyskinesias improved after 10 h (Video 2).

On the second day of antiviral treatment, body temperature was increased to 37.8 °C. There was a slight increase in general fatigue. His appetite decreased and his sleepiness increased. Although dyskinesia improved, we started levodopa/benserazide 100/25 mg 3 × 1/day again; however, dyskinesias re-emerged with the first dose of the medication (Video 3). On the third day of antiviral treatment, his systemic and neurological examination did not change. There was a further increase in fatigue (Video 4). On the fourth day, the patient suddenly died because of cardiac acute heart attack.

There is limited data about the outcomes of PD patients with COVID-19 disease. They almost required additional levodopa due to severe motor dysfunction. Antonini et al. presented 10 PD patients with COVID-19 infection. Half of them required increase in levodopa dosage; however, none of them required decreasing (1). Similarly, a community-based case–control study revealed worsening of levodopa-responsive motor symptoms and increased daily *off* time in 12 PD patients with COVID-19 infection (2). Although there was a tendency toward increased dyskinesia scores, it was not statistically significant and patients were not evaluated during active infection. Erro et al. reported two PD cases with severe dyskinesias after administration of SARS-CoV2 mRNA vaccine and suggested that immune response triggered by the vaccine might increase the permeability of blood–brain barrier and drug availability, thus causing the genesis of levodopa-induced dyskinesia (4). However, these cases did not have active infection; we suggested that similar immune responses might be triggered by acute COVID-19 infection in our case.

Clinicians are familiar of the fact that a subacute worsening of motor symptoms may be experienced following the systemic infections in PD. However, several different mechanisms may be involved in deterioration; the underlying

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Table 1 The progression of the motor complications and treatment approaches during COVID-19 infection

Day	Neurological examination	Treatments	Clinical approaches	Laboratory tests	Video
Before admission to outpatient clinic					
1st day	Severe generalized dyskinesias during all day long	L-dopa/benserazide 100/25 mg 6 × 1/day Pramipexole ER 3 mg 1 × 1/day			
2nd day	Severe generalized dyskinesias during all day long	L-dopa/benserazide 100/25 mg 6 × 1/day Pramipexole ER 3 mg 1 × 1/day			
Admission to outpatient clinic					
3rd day	Severe generalized dyskinesias during all day long	L-dopa/benserazide 100/25 mg 6 × 1/day Pramipexole ER 3 mg 1 × 1/day	Dopaminergic medications stopped	COVID-19 PCR: positive	Video 1
4th day	Left side dominant parkinsonism with no dyskinesias revealed after 10 h of medication cessation	Favipiravir 200 mg 2 × 8/day	L-dopa/benserazide 100/25 mg 3 × 1/day started when dyskinesias improved and parkinsonism revealed		Video 2
	Generalized dyskinesias reappeared after first dose of L-dopa	L-dopa/benserazide 100/25 mg 3 × 1/day Favipiravir 200 mg 2 × 8/day			Video 3
5th day	Generalized dyskinesias during all day long	L-dopa/benserazide 100/25 mg 3 × 1/day Favipiravir 200 mg 2 × 3/day			Video 4
6th day	Generalized dyskinesias during all day long	L-dopa/benserazide 100/25 mg 3 × 1/day Favipiravir 200 mg 2 × 3/day			
7th day	Generalized dyskinesias	L-dopa/benserazide 100/25 mg 3 × 1/day Favipiravir 200 mg 2 × 3/day	He died due to acute myocardial infarction		

Abbreviations: *COVID-19*, coronavirus disease 2019; *PCR*, polymerized chain reaction

mechanisms are still unknown (5). Changes in pharmacodynamics of dopaminergic drugs, the effects of systemic inflammatory responses, altered dopamine metabolism in the brain, and increased levels of stress during the infections are thought to be possible mechanisms (5, 6). Despite these hypotheses, emerging dyskinesia due to acute infection is a very rare condition in PD. However, the possible underlying mechanisms are unknown; individual immunological profiles should alter the responses. Consequently, clinicians should be aware of acute COVID-19 infection that could be presented as new onset severe dyskinesias in patients with PD.

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Declarations

Conflict of interest The authors declare no competing interests.

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