

## Impact of SARS-CoV-2 Infection in Spinocerebellar Ataxia 12 Patients

Long sessions of coronavirus disease 2019 (COVID-19) lockdown and self-imposed restrictions have created a negative impact on patients with degenerative diseases such as Parkinson's disease.<sup>1</sup> Similarly, patients with degenerative cerebellar ataxia (CA) are also at risk for contracting COVID-19 infection and its complications, such as long-term COVID sequelae, referred to as "post-COVID-19 syndrome" or "long COVID."<sup>2,3</sup> Currently, there is no published report on the effects of COVID-19 and post-COVID-19 syndrome in patients with CA. Here, we report our observations on the impact of COVID-19 in 102 genetically confirmed patients with spinocerebellar ataxia 12 (SCA12), which is one of the most common forms of hereditary ataxia in North India.<sup>4</sup> During the COVID-19-related lockdown period from April 2021 to June 2021, the patients were followed up routinely via telephone. We conducted a structured telephone interview to identify the implications and outcomes of COVID-19 using a questionnaire prepared by movement disorder experts.

Of 102 patients, 28% (29; 21 male and 8 female) were infected with COVID-19 (COVID-19-SCA12). The mean age and disease duration at interview were 59.73 (SD ± 10.02) and 8.0 (SD ± 4.63) years, respectively. Demography, other characteristics, COVID-19-related issues, and outcomes among COVID-19-positive and -negative patients with SCA12 are listed in Table 1. About 83% of all patients with SCA12 had received at least one dose of COVID-19 vaccine. Among patients with COVID-19-SCA12, deterioration of gait, tremors, slurred speech, and weakness were reported by 27.5%, 17%, 7%, and 10%, respectively, during the pandemic. Daily activities were performed independently by 66% of patients, while 24% needed support. Hypertension (21%) and diabetes (31%) dominated as comorbid illnesses. History of contact with COVID-19-infected family members or workplace cohabitants was confirmed by 31% of patients. Hospitalization was required in 24%, while 76% of patients recovered in home isolation. The most frequent COVID symptoms were low-grade fever (90%), weakness (90%), and coughing (41%). The majority of patients (92%) recovered within 4 weeks of onset of COVID-19 symptoms. Three patients died in the hospital. Two patients experienced post-COVID complications: one experienced short-term memory loss, and the other had a temporary confused mental state.

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The frequency of covid-19 infection in our SCA 12 patients was not very different (28% vs. 24.1%) from national seroprevalence data of the general population in India.<sup>5</sup> High vaccination rate in patients with SCA12 could be attributed to their living in relatively larger cities, their higher education level, and their older age, which made them eligible for early vaccination.<sup>6</sup> The phenotype of SARS-CoV-2 infection in our patients with SCA12 concur with existing literature on the most prevalent COVID-19 symptoms in the general adult population.<sup>7</sup> Recovery of patients with COVID-19-SCA12 matched with acute COVID-19 timelines.<sup>3</sup>

We believe that prolonged confinement to homes and disruption in rehabilitation sessions may have contributed to the worsening of ataxic symptoms in patients with SCA12. We

**TABLE 1** Demography, outcome, and features of COVID-positive and -negative patients with SCA12

Demography and other measures (N = 102)	COVID-19 positive (n = 29)	COVID-19 negative (n = 73)
Age, mean ± SD (range), y	60.28 ± 9.75 (38–75)	59.51 ± 10.18 (25–80)
Age at onset, mean ± SD (range), y	52.64 ± 9.68 (25–72)	51.71 ± 10.55 (18–72)
Duration, mean ± SD (range), y	8.54 ± 4.92 (1–20)	7.79 ± 4.53 (1–25)
Sex, n (%)		
Male	21 (72.4)	50 (68.5)
Female	8 (27.5)	23 (31.5)
Current mobility, n (%)		
Independent	19 (65.5)	49 (67.1)
Needs support	7 (24.1)	20 (27.4)
Wheelchair	0 (0.0)	4 (5.5)
Comorbidity, n (%)		
Hypertension	6 (20.7)	17 (23.3)
Diabetes	9 (31.0)	18 (24.5)
Hypothyroidism	4 (13.8)	2 (2.7)
Coronary artery disease	0 (0.0)	2 (2.7)
Bronchial asthma	1 (3.4)	0 (0.0)
Anxiety and depression	0 (0.0)	1 (1.4)
Bipolar disorder	1 (3.4)	1 (1.4)
None	14 (48.2)	40 (54.8)
Contact with COVID-19-infected person, n (%)		
No	2 (6.9)	63 (86.3)
Possibly yes	18 (62.0)	7 (9.6)

(Continues)

TABLE 1 Continued

Demography and other measures (N = 102)	COVID-19 positive (n = 29)	COVID-19 negative (n = 73)
Yes	9 (31.0)	3 (3.4)
COVID-19, n (%)		NA
Oligosymptomatic	22 (75.9)	
Hospitalization	7 (24.1)	
COVID-19 symptoms, n (%)		NA
Fever	26 (89.7)	
Cough	12 (41.3)	
Sore throat	7 (24.1)	
Breathing difficulty	9 (31.0)	
Loss of taste and smell	9 (31.0)	
Muscle pain	3 (10.3)	
Weakness	26 (89.7)	
Headache	2 (6.9)	
Pneumonia	1 (3.5)	
Asymptomatic	1 (3.5)	
Days to recover, n (%)		NA
First week	12 (46.1)	
Second week	10 (38.4)	
Third week	1 (3.8)	
Fourth week	1 (3.8)	
Fifth week and more	2 (6.9)	
Outcome, n (%)		NA
Recovered	26 (89.7)	
Death	3 (10.3)	
Post-COVID-19 complications, n (%)		NA
Short-term memory loss	1 (3.5)	
Confused mental state	1 (3.5)	
Worsening of ataxia symptoms during pandemic, n (%)		
Stable	16 (55.2)	42 (57.5)
Gait	8 (27.6)	17 (23.3)
Tremors	5 (17.2)	19 (26.0)
Speech	2 (6.9)	16 (22.0)
Fatigue	3 (10.3)	8 (11.0)
COVID vaccination, n (%)		
At least one dose	27 (31.0)	58 (5.5)
Not done	2 (6.9)	15 (20.6)

NA, not applicable.


could not compare the frequencies of COVID-19-SCA12 and their immunization with the general population of the same mean age group because the age-group-wise data on the prevalence of COVID-19 is still evolving in India.

In conclusion, patients with COVID-19-SCA12 fared similarly as those without COVID-19 during the pandemic, and COVID-19 outcomes in patients with SCA12 were comparable with COVID-19 in the general population. Therefore, they can be treated with the same protocol and care that is given to patients with general COVID-19. It may be useful to evaluate the impact of COVID-19 on other types of common CAs (SCA1 and SCA2), with rapid progression and severe outcomes having subclinical pulmonary dysfunction. ■

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### Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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