COVID-19 and Movement Disorders Abstracts



MDS Virtual Congress 2020

SEPTEMBER 12-SEPTEMBER 16 www.mdscongress.org



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COVID-19 and Movement Disorders Abstract 1: Perceived stress and Parkinson's motor symptoms during COVID-19 lockdown in New Zealand

R. Blakemore, M. Pascoe, L. Livingston, B. Young, B. Elias, M. Goulden, S. Grenfell, D. Myall, T. Pitcher, J. Dalrymple-Alford, C. Le Heron, T. Anderson, M. MacAskill (Dunedin, New Zealand)

Objective: To examine the impact of the COVID-19 lockdown on perceived levels of stress, changes in physical activity, and Parkinson's disease (PD) motor symptoms.

Background: As the COVID-19 pandemic continues to grip the globe, there is concern for the increased vulnerability of those with chronic disease, including PD [1]. New Zealand was placed in complete lockdown for four weeks. The full impact of this self-isolation period on mental health and wellbeing is yet to be determined. Stress plays a key role in PD by acting on the dopaminergic system and worsening patients' motor symptoms [2]; coping with and resilience to stress is reduced when dopamine is deficient [1,2]. The lockdown may have placed this cohort at greater risk of experiencing higher stress, which, together with restricted physical activity, may have exacerbated interactions between stress and their already compromised motor system.

Method: 144 people with PD and 51 healthy controls (HC) were invited to participate in a phone or online survey during lockdown. 136 PD (latest previous H&Y 2.4±0.6, disease duration 11±6 years) and 49 HC completed the Perceived Stress Scale (PSS) [3], a Physical Activity Levels Questionnaire assessing physical activity duration and intensity during and immediately prior to lockdown, and a PD Motor Symptom Scale probing perceived changes in tremor, dyskinesia, balance/gait and bradykinesia.

Results: Perceived stress was higher in PD (12.1±6.4) than HC (8.6±6.0; t=3.3, p=.001). Of 90% PD patients reporting tremor, 70% experienced no changes since lockdown, 12% reported slight, 7% mild, 7% moderate and 4% substantial worsening. Results for dyskinesia and bradykinesia showed similar patterns of change. 49% of patients reported worsening (slight to substantial) of balance/gait. PSS scores were higher in those reporting a worsening of tremor (2.4 points on PSS, 95% CI [0.7, 4.1]), dyskinesia (2.0, 95% CI [0.1, 4.0]) or balance/gait (1.8, 95% CI [0.2, 3.4]) than to those indicating no change. Including physical activity as a predictor did not improve the model fits.

Conclusion: Consistent with evidence of a close interaction between stress and motor function, particularly in dopamine-related movement disorders [2], we found higher perceived stress and worsening of motor symptoms in PD during the COVID-19 lockdown. Monitoring and addressing stress levels may be an important adjunct strategy to improve motor function in PD.

References: [1] Helmich RC, Bloem BR. The impact of the COVID-19 Pandemic on Parkinson's Disease: Hidden sorrows and emerging opportunities. Journal of Parkinson's Disease. 2020;10:351-4. [2] Metz GA. Stress as a modulator of motor system function and pathology. Reviews in the Neurosciences. 2007;18:209-22. [3] Cohen S, Williamson G. Perceived stress in a probability sample of the United States. In: Spacapan S, Oskamp S, editors. The Social Psychology of Health: Claremont Symposium on Applied Social Psychology. Newbury Park, CA: Sage; 1988.

COVID-19 and Movement Disorders Abstract 2: Neurological manifestations of COVID-19 in Parkinson's disease

S. Ray, P. Agarwal, A. Madan, D. Burdick, B. Tyson (Kirkland, WA, USA)

Objective: The aim of this study is to report the common neurological manifestations of COVID-19 in Parkinson's Disease (PD) patients presenting to our hospital in Kirkland, WA.

Background: Although neurological disorders are not included in the high risk category for COVID-19, there is mounting evidence that patients with chronic disorders may be at risk for severe COVID-19. Parkinson's disease (PD) patients share common characteristics with severe COVID-19 patients in terms of age and comorbidities. Thus, PD patients or at least certain PD populations (e.g., advanced stage) may be at potential risk for severe COVID-19. A spectrum of neurological manifestations associated with COVID-19 have been reported in 36.4% -56.4% of cases, ranging from dizziness, headache, hyposmia, hypogeusia, dysphagia, muscle pain, seizures, strokes, loss of consciousness, and nerve pain. Reports of neurological manifestations of COVID-19 in PD population is still evolving.

Method: We report neurological manifestations in 7 PD patients out of 404 consecutive patients with COVID-19 who were seen in outpatient clinics and admitted in the hospital between Feb 20, 2020 and May 4, 2020 at Evergreen Hospital, Kirkland, Washington, U.S.A. This hospital reported the first cases and first deaths of COVID-19 patients in the United States.

Results: Four out of seven patients (57.1%) were white male with mean age of 70.6 years. Majority of PD patients presented with CNS (central nervous system) symptoms. One (14.3%) patient with PD and DBS had worsening of tremor and another patient reported falls and worsening of tremor. Metabolic encephalopathy was detected in 4 (57.1%) PD patients as well, three(42.8%) of them had pre-existing PD dementia. Two (28.6%) patients died and the remaining five (71.4%) recovered to baseline PD status and were discharged.

Conclusion: It is important to recognize the neurological manifestations in outpatient PD patients as being related to COVID-19 to initiate early intervention and prevent community spread. Parkinson's disease patients may presenting with worsening of their baseline PD symptoms or present with metabolic encephalopathy in setting of baseline PD dementia. Based on the susceptibility to severe disease, its impact on PD disease severity and potential long-term sequelae poses challenges of PD management during this outbreak. Neurologists need to balance how we can maintain effective care for PD patients without exposing them, or ourselves, to the risk of COVID-19.

COVID-19 and Movement Disorders Abstract 3: Effect of Circumstances Related to COVID-19 on Nonmotor Symptoms of Parkinson's Disease

M. Feldman, E. Padron, J. Margolesky (Miami, FL, USA)

Objective: To quantify the effects of COVID-19 pandemic-induced social and environmental changes on non-motor symptoms of Parkinson's disease (PD).

Background: Patients with PD may decompensate, in terms of motor and non-motor symptoms, in times of psychological or physiological stress. From pandemic era clinical encounters, we have observed that social isolation, reduced physical activity, augmented mood disorders, and altered sleep have negatively impacted many PD patients.

Method: We included 15 patients with PD seen in follow up via telehealth during March or April 2020. We recorded patients age, gender, disease duration, Hoehn and Yahr (HY) stage, and medications. We asked patients to provide data pertaining to hours of exercise, social engagement, news engagement, work (from home or at workplace) before and during the COVID-19 pandemic. All data was objective and quantitative. Before and during scores on the following scales were tabulated: PHQ-9, GAD-7, ISI, RBDQ, SCOPA-AUT, as well as the psychosis and cognitive questions from the MDS-UPDRS part II. A 2-tailed paired samples t-test was used to compare answers before and during the pandemic. Cohen's d was used to describe effect size.

Results: Clinical characteristics of the participants (age, sex, disease duration, Hoehn and Yahr (HY) stage) are summarized in Table 1. Results are summarized in Table 2. Comparison of objective data before and during the pandemic suggest that cognition, depression, anxiety, sleep latency, sleep duration, and continuity of sleep have all been negatively affected. Additionally, decreased exercise and socialization were independently correlated with effects on mood, sleep, and cognition.

Conclusion: Global events and changes related to the pandemic have significantly worsened some but not all nonmotor symptoms of PD in our patient population. Overall, mood, cognition, and sleep are affected, but autonomic and REM sleep behavior disorder (RBD) symptoms are not. These data may suggest that times of great stress affect certain nonmotor domains whereas others remain more resilient. Our results also suggest an interplay between decreased sleep quality, socialization and exercise with augmentation of mood and cognitive symptoms.

Table 1: Demographics

Gender	Age	HY stage Mean (range)	Disease duration (years) Mean (range)
2F, 13M	69.467	2.267 (2-4)	4.533 (1-10)

Table 2: Difference of Symptom Severity Before and During Pandemic

Item Tested	Paired-samples t-test	Cohen's d
PHQ-9 score	0.001	-0.858
Difficulty falling asleep	0.006	-0.540
Hours of social engagement	0.010	-0.663
GAD-7 score	0.012	-0.829
Hours of exercise	0.013	0.757
Difficulty staying asleep	0.014	-0.462
Waking up too early	0.028	-0.382
Hours at work	0.029	-0.586
Cognition	0.041	-0.495
Hours of news engagement	0.093	-0.449
Straining	0.096	-0.330
Working from home	0.127	-0.244
Fullness	0.164	-0.178
Constipation	0.164	-0.134
Lightheaded after standing	0.164	-0.193
Urinary incontinence	0.173	-0.498
Swallowing issues	0.189	-0.242
Drooling	0.189	-0.293
Stool incontinence	0.334	-0.231
Overly photosensitive	0.334	-0.110
Hallucinations/Psychosis	0.334	-0.216
Weak stream	0.334	-0.206
Lightheaded	0.334	-0.098
Bladder fullness	0.334	-0.216
Night sweating	0.334	-0.216
Repeat urination within 2 hrs	0.334	0.073
Cold intolerance	0.334	-0.140
# of people in home	0.334	0.043
RBDQ	1.000	0.000
Nocturnal urination	1.000	0.000
Fainted past 6 mo	1.000	0.000
Day sweating	1.000	0.000
Heat intolerance	1.000	0.000

COVID-19 and Movement Disorders Abstract 4:

Withdrawn

COVID-19 and Movement Disorders Abstract 5: Parkinson's disease remote patient monitoring during the COVID-19 lockdown

F. Motolese, A. Magliozzi, F. Puttini, M. Rossi, K. Karlinski, A. Stark-Inbar, Z. Yekutieli, V. Di Lazzaro, M. Marano (Rome, Italy)

Objective: To evaluate the feasibility of a remote patient monitoring program in a real-life Parkinson's disease (PD) cohort during the Italian COVID-19 lockdown.

Background: Italy has been one of the first and most affected countries by Coronavirus disease 2019 (COVID-19). On March 2020, for about 3 months, the Italian government imposed a national lockdown, thus limiting free movement of people and shutting down all the activities considered not essential. Such restriction also aimed to protect fragile elderly people with chronic diseases, a population that is particularly at risk of COVID-19 complications. However, these patients often need a tight follow-up and therapies need to be tailored from time-to-time. In the last few years, mobile technologies have been extensively investigated in patient management.

Method: Fifty-four non-demented PD patients who were supposed to attend the outpatient March clinic were recruited for a prospective study. All patients had a known UPDRS-III and a modified Hoehn and Yahr (H&Y) score and were provided with EncephaLog™, a smartphone application capable of providing indicators of gait, tapping, tremor, memory and executive functions. Different questionnaires exploring non-motor symptoms and quality of life were administered through phone-calls. Patients were asked to run the app at least twice per week (i.e., full compliance). Subjects have been phone-checked weekly along a 3-week period for compliance and final satisfaction questionnaires.

Results: Forty-five patients (83.3%) run the app at least once; Twenty-nine (53.7%) subjects were half-compliant, while 16 (29.6%) were full compliant. Adherence was hindered by technical issues or digital illiteracy (38.7%), demotivation (24%) and health-related issues (7.4%). Ten patients (18.5%) underwent PD therapy changes. The main factors relating with compliance included loss of interest, sadness, anxiety, the presence of falls and higher H&Y. Gait, tapping, tremor and cognitive application outcomes were correlated to disease duration, UPDRS-III and H&Y.

Conclusion: The majority of patients were compliant and satisfied by the provided monitoring program. Some of the application outcomes were statistically correlated to clinical parameters, but further validation is required. Our pilot study suggested that the available technologies could be readily implemented also with the current population technical and intellectual resources.

COVID-19 and Movement Disorders Abstract 6: Impact of social distancing during COVID-19 pandemic on quality of life in Brazilian people with Parkinson's disease

F.A. Barbieri, T. Penedo, F.B. Santinelli, E. Costa, A.P.B. Silveira, M.H. Kuroda, I. Salomão, T. Cesário, J. Pilon, L. Simieli (Bauru, São Paulo, Brazil)

Objective: To investigate the effects of social distancing (SD) during the COVID-19 pandemic on quality of life (QoL) in people with Parkinson's disease (PwPD). Specifically, it was analyzed the impact of SD on QoL, physical activity level, depression, anxiety and quality of sleep.

Background: The COVID-2019 pandemic is a highly pathogenic viral infection that changed drastically daily life, including SD as a major preventive measure[1]. However, the change of routine requires a flexible adaptation to new circumstances, which is more difficult for PwPD as a result of nigrostriatal dopamine depletion[2]. Consequently, daily life in PwPD can be affected directly during SD, especially aspects related to the QoL, physical activity level, depression, anxiety and quality of sleep that depend on interventions and social interaction.

Method: 103 PwPD [Table 1] answered a designed on-line questionnaire addressed to six sections to investigate the effects of SD: general information, motor and non-motor symptoms (frequency of symptoms during SD), QoL (short-version of Parkinson's Disease Questionnaire), physical activity level (short-form of International Physical Activity Questionnaire), depression and anxiety (Hospital Anxiety and Depression Scale), and quality of sleep (Mini Sleep Questionnaire).

None of the participants reported a positive diagnostic of COVID-19 [Table 1]. 88 were in SD for more than seven weeks. The majority of PwPD continued practicing exercise during SD, but 74 PwPD were classified as low activity level [Figure 1]. 33 and 70 participants reported at least one fall and worsening in motor performance [Table 2] during SD, respectively. Among symptoms enquired, bradykinesia and fatigue were the symptoms with greater worsening during this period [Table 2]. Finally, 56% reported low QoL, around 20% of individuals reported anxiety and depression symptoms, and 76% severe sleep difficulties [Figure 1].

Conclusion: The SD during the COVID-19 pandemic impacted negatively the QoL in PwPD, especially related to bradykinesia, physical activity level and sleep quality. Teleinterventions should be included in the new routine of PwPD to reduce the impacts of SD.

References: 1. Helmich, R.C., Bloem, B.R. (2020). JPD; 10:351–354. 2. Robbins, T.W., Cools, R. (2014). Mov Disord; 29:597-607.

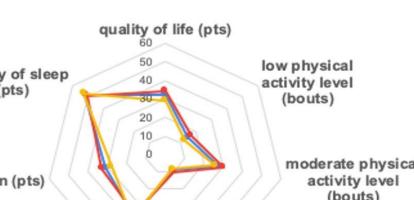
Table 1. Demographic data of study participants.

	female	male	total
Numbers	53	50	103
Age (years)	67±12	66±9	67±10
Body mass (kg)	65±15	78±14	71±16
Height (m)	1.58±0.08	1.71±0.07	1.64±0.09
Disease durations (years)	7±5	10±8	8±7
COVID-2019 positive diagnostic (%)	0	0 (4% maybe)	0 (1.9% maybe)
Falls (n)	67 (1.3±4)	48 (1±3)	115 (1.1±3)
People performing physical activity (n)	40 (75%)	44 (88%)	84 (82%)
Time in partial lock-down (social distancin	g)		
None (%)	6	8	7
1 to 2 weeks (%)	0	0	0
3 to 4 weeks (%)	0	4	2
5 to 7 weeks (%)	2	10	6
More than 7 weeks (%)	92	78	85

Table 2. Clinical data during COVID-19 pandemic of study participants.

	Female (n=53)	Male (n=50)	Total (n=103)
Reported worsening general motor performance (%)	77	58	68
Reported worsening rest tremor (%)	38	24	31
Reported increased freezing episodes (%)	25	22	23
Reported worsening memory (%)	23	30	26
Reported worsening bradykinesia (%)	60	58	59
Reported increased fatigue (%)	55	22	39
Reported increased of unbalance (%)	32	32	32
Reported increased feeling of isolation (%)	49	42	46

→ total → female → male



quality of sleep (pts) moderate physical depression (pts) (bouts) high physical anxiety (pts) activity level (bouts)

Figure 1. The level of QoL, physical activity level (low, moderate and high), anxiety, depression and quality of sleep in PwPD during social distancing in Brazil. 1 bout = 10 min of exercise.

COVID-19 and Movement Disorders Abstract 7: Rapid Implementation of Telemedicine During the COVID-19 Pandemic: The Emory Experience

C. Esper, L. Scorr, S. Papazian, D. Bartholomew, G. Esper, S. Factor (Atlanta, Georgia, USA)

Objective: To present data associated with the rapid implementation of virtual visits in the form of audiovisual and telephonic telemedicine in a large, academic, movement disorders practice.

Background: Telemedicine has rapidly gained momentum in movement disorders neurology during the COVID-19 pandemic to preserve clinical care while mitigating the risks of in-person visits.

Method: We describe the implementation of virtual visits over a five-week period and retrospectively compare factors associated with both telemedicine visits and pre-pandemic in-person visits including demographics, distance driven, and diagnosis distribution with a focus on patients with deep brain stimulators. Comparisons between groups were made using two-tailed t-tests and Chi-square test.

Results: 686 telemedicine visits were performed over a five-week period. Average age was 64.9 (+14.9) years, 45% were female, and most patients were Caucasian (72.9%). Men were more likely to transition to a telemedicine visit (p=0.02). Telemedicine patients were, on average, further from clinic compared to those seen in person over the last year (41.3 miles vs. 26.2 miles, p

Conclusion: Telemedicine is feasible, viable and relevant in the care of movement disorder patients, though health care disparities appear evident for women and minorities. Patients with deep brain stimulators preferred telemedicine in our study. Further study is warranted to explore these findings.

Table 1: Weekly Progression of Telemedicine Encounters

Telemedicine Arrivals				
Row Labels	Telephone	Telemedicine	Other	Grand Total
Week of 3/23/20	30	62	1	93
Week of 3/30/20	18	94	3	115
Week of 4/6/20	20	102	2	124
Week of 4/13/20	29	120	3	152
Week of 4/20/20	25	124	4	153
Week of 4/27/20				
(Monday/Tuesday)	4	44	1	49
Grand Total	126	546	14	686

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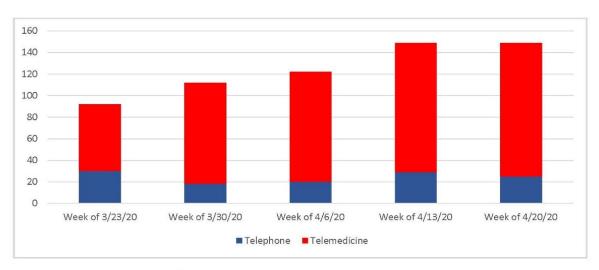


Figure 1. Weekly Arrivals by Bill Type

Table 2: Baseline Characteristics of Study Population

Baseline Characteristics of Patient Population				
	Туре	Type of Care		
Characteristics	Pre-Pandemic (in person) (n=6433)	COVID-19 (telemedicine) (n=686)	p-value	
Demographics				
Avg Age, (SD)	63.99 (15.75)	64.86 (14.88)	0.17	
Age Group (%)	10-19 (1.3%) 20-29 (3.2%) 30-39 (4.9%) 40-49 (7.2%) 50-59 (13.2%) 60-69 (25.8%) 70-79 (32.4%) 80-89 (11.1%) 90+ (0.9%)	10-19 (0.4%) 20-29 (4.0%) 30-39 (4.2%) 40-49 (5.4%) 50-59 (12.0%) 60-69 (27.2%) 70-79 (36.5%) 80-89 (9.4%) 90+ (0.7%)		
Gender			0.02	
Male	3229 (50.19%)	376 (54.81%)		
Female	3204 (49.81%)	310 (45.19%)		
Race Caucasian A.A.* Asian Other	4370 (67.93%) 945 (14.69%) 167 (2.6%) 951 (14.8%)	500 (72.89%) 80 (11.66%) 20 (2.92%) 86 (12.5%)	0.01	
Distance (mi)	26.21 (44.66)	41.34 (85.73)	<0.001	
Diagnosis (%)			<0.001	
PD	2723 (42.46%)	421 (61.37%)		
ET	475 (7.41%)	30 (4.37%)		
Dystonia	677 (10.6%)	33 (4.8%)		
HD	82 (1.28%)	10 (1.46%)		
Other	2476 (38.5%)	192 (27.99%)	-0.001	
DBS	454 (7.06%)	79 (11.52%)	<0.001	

^{*} African American

COVID-19 and Movement Disorders Abstract 8:

There's no place like home? Consequences of the COVID-19 lockdown on health and well-being of patients with Parkinson disease and post-stroke

G. Yogev-Seligmann, M. Kafri (Haifa, Israel)

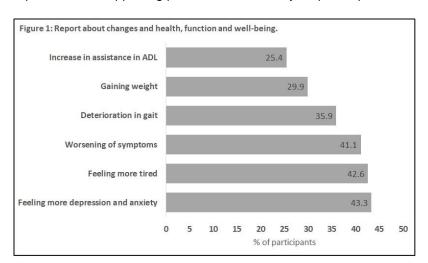
Objectives: To describe health and well-being consequences of the COVID-19 lockdown in patients with Parkinson's disease (PD) or post-stroke and to test associations between patient activation and these consequences.

Background: People with chronic disease like PD rely on routine medical and rehabilitative care to maintain their daily function and health. These facets of care are important parts of self-management. However, this was challenged by more than 8 weeks of lockdown, which limited participation in regular routines. Patient activation describes people's knowledge, skill, and confidence in managing their own health. It is often used as a measure of self-confidence and ability to effectively self-manage.

Method: Patients with PD or post-stroke living in the community were invited to answer an anonymous survey through social media and patient associations. Part 1 included 27 multiple-choice questions regarding status and change in status of mobility, mood (depression, anxiety), tiredness, social support, body weight, physical activity, rehabilitative treatments and disease symptoms. Part 2 consisted of the Patient Activation Measure (PAM®, Insignia Health), which has 13 statements rated on a Likert scale according to agreement. Scores are divided into 4 levels, where 1 represents patients who tend to be passive and feel overwhelmed managing their own health ("my doctor is in charge of my health"), and 4 represents patients who have effectively adopted self-management behaviors ("I'm my own advocate").

Results: 198 people (64% men) replied. Among them, 171 (86.3%) were patients with PD or caregivers, 27 (13.7%) were post-stroke or caregivers. Mean age was 71.10±8.29 and disease duration was 9.70±8.21 years. Figure 1 presents the percentage of participants who reported a change in each of the domains during the lockdown, relative to the previous period. 61.8% reported their rehabilitative treatments ceased and 68.7 % associated worsening symptoms with cancelled rehabilitation or decreased physical activity. PAM levels were inversely correlated with increased tiredness (r=-0.26, p"

Conclusion: Inability to maintain routine activities due to lockdown had a major negative impact on patients with PD or post-stroke. Supporting patient activation may empower patients in times of stress.



COVID-19 and Movement Disorders Abstract 9: Managing Patients With Neurogenic Orthostatic Hypotension During the COVID-19 Pandemic

P. Khemani, M. Olson, G. Moguel-Cobos (Seattle, WA, USA)

Objective: To describe best practices for managing patients with neurogenic orthostatic hypotension (nOH) during the COVID-19 pandemic.

Background: Untreated nOH can be serious and may lead to syncope and serious injury. The COVID-19 pandemic has disrupted routine management of patients with nOH. Healthcare providers (HCPs) must adapt to avoid complications and provide optimal care.

Method: Perspectives are provided based on clinical experience.

Results: When in-office consultations are not feasible, as during the current pandemic, remote evaluation and management of patients with nOH via telemedicine is necessary. A critical component of nOH management is monitoring orthostatic blood pressure (BP) and heart rate (HR). Part of patient training for implementing care via telemedicine should include instructions on how to properly monitor BP and HR at home when supine, sitting, and after standing for 3 minutes. Commercially available wearable monitoring devices are easy for patients to use and accurate. Ideally, patients should be encouraged to keep a diary of nOH symptoms (eg. dizziness/lightheadedness) along with their BP and HR measurements. During remote visits (scheduled as needed), the diary and patient medical history should be reviewed, along with conditions and concomitant medications that may cause or exacerbate nOH symptoms. Homebound patients may become socially isolated and be at increased risk of deconditioning. Telemedicine offers access and more frequent contact with these patients, as well as opportunities for monitoring pharmacological and nonpharmacological interventions (increased fluids/salt intake, gentle exercise) for nOH. Patients with nOH tend to be older with multiple comorbidities and are likely at greater risk for poor outcomes if they contract COVID-19. HCPs should be aware that dizziness has been reported as a symptom of COVID-19. Thus, patients reporting sudden changes or worsening of nOH symptoms need to be closely monitored for the possibility of COVID-19 infection.

Conclusion: Patients with nOH can be managed successfully through telemedicine during the COVID-19 pandemic. In our experience, patients seem highly receptive to telemedicine as an alternative to in-office visits. Telemedicine may become an important treatment approach for patients with nOH. Future studies examining its role and advantages (eg, greater frequency care vs traditional in-person visits) are warranted.