

Characterization of prolonged COVID-19 symptoms in an outpatient telemedicine clinic

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Abstract

We identified patients with coronavirus disease 2019 (COVID-19) in a telemedicine clinic who requested ongoing follow-up calls 6 weeks after symptom onset. In this group, respiratory symptoms are the most common complaints, asthma and lung disease are frequent comorbidities, and patients often have not returned to work or usual activity.

Key words: coronavirus disease 2019, outpatient, symptoms, prolonged

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Introduction

While the clinical course of ambulatory patients with coronavirus disease 2019 (COVID-19) is described in early reports [1-4], persistent symptoms beyond 5 weeks are not yet well characterized. Data illustrating delayed recovery are available from the severe acute respiratory virus disease (SARS) outbreak in 2003 [5] as well as community-acquired pneumonia [6], but these reports are limited to post-hospitalization cohorts. Anecdotally, some patients with COVID-19 report delayed return to routine activity, even with mild illness.

The Emory Clinic Virtual Outpatient Management Clinic (VOMC) is a telemedicine program for the care of adults with COVID-19 during isolation at home. The VOMC follows patients with confirmed COVID-19 with regular telephone calls for a duration of 7-21 days depending on patient symptom severity, comorbidities, and age[7]. The calls may be continued beyond 21 days for ongoing symptom monitoring at the request of the patient and/or provider (registered nurse or advanced practice provider). We seek to describe the persistent symptoms experienced by patients with mild COVID-19 by reviewing records of those who requested follow-up VOMC care for greater than the planned 21 days and more than 6 weeks beyond symptom onset. We hypothesize that specific comorbidities may be associated with prolonged symptom duration in comparison to the overall VOMC population.

Methods

We conducted a search of the patients enrolled in the VOMC between March 24 and May 26, 2020 who received their final VOMC follow-up call greater than 6 weeks after symptom onset date. Exclusion criteria were: (1) unclear onset date, (2) VOMC follow-up call duration of less than 3 weeks, and (3) hospitalization prior to entering VOMC. Charts were reviewed through June 8, at which time all eligible patients had been discharged from VOMC.

Chart review included: (1) verification of patient demographics and comorbidities documented at VOMC intake visit, (2) verification of symptom onset dates, (3) review of follow-up notes during the 6th week of symptoms, (4) review of return to work advice/disability letters, and (5) review of final notes for health status at time of VOMC discharge. We obtained data from standardized lists of symptoms and comorbidities coded in the VOMC notes, but allowed for specified “other” symptoms and comorbidities specifically denoted in provider narrative portion(s) of the note to be coded as “other” for later analysis. For patients who required additional medical evaluation after the acute period (defined as an in-person or telemedicine visit at least 3 weeks into illness), we reviewed evaluation notes, diagnostics, and final diagnoses (including “alternate diagnoses” and “contributing diagnoses” based on provider documentation). Delayed return to activity was coded as present only if a provider note during the 6th week of symptoms specifically noted less ability to perform physical activity (e.g. walk, jog, or run errands) compared to activity status immediately before illness. All chart review data were entered into a standardized template capturing all elements that we have reported in results.

Data for specific comorbidities were available for the overall VOMC cohort[7], extracted by data pull and available for comparison to the comorbidities for our “prolonged symptom”

subset in this study. For the comparison of comorbidities, we used the same data source (intake note) for the overall cohort and the prolonged symptom subset. We included additional comorbidities in our chart review template if identified in 2 or more charts (prolonged group only). Results were analyzed in Microsoft Excel using descriptive statistics.

Results

A total of 551 patients were identified as being monitored by VOMC during the study period. Of these, 496 were confirmed to have COVID-19 by nasopharyngeal PCR and enrolled in VOMC care. We identified 51 (9.4%) as receiving calls >6 weeks after symptom onset and arrived at a total of 26 (4.8%) “prolonged cases” after exclusions: we removed 5 patients due to unclear start dates (3 reporting symptom onset >2 months before local transmission suspected, 2 with negative testing at symptom onset and retesting positive >1 month later), 10 patients due to total symptoms <6 weeks (dates clarified in chart review), and 10 patients due to receiving fewer than 21 days of VOMC calls (for example, an initial VOMC visit in the 5th week of illness, followed for 1 week and discharged).

Table 1 outlines the demographics and comorbidities of patients in the “prolonged cohort” compared to the overall cohort. The majority of patients were female (76.9%), and the median age was 47.5 years [range 23-78]. Racial demographics were as follows: 14 (53.8%) African American, 5 (19.2%) Caucasian, 7 (26.9%) other or not recorded. The most common conditions noted were BMI >30 (53.8%), asthma (42.3%), allergies (34.6%), and hypertension (34.6%).

Patients with persistent symptoms entered VOMC a median of 9.5 days after symptom onset [range 4-39] and were followed by VOMC for a median of 38 days [range 21-49]. From symptom onset to discharge from VOMC was a median of 47.5 days [range 42-80]. At VOMC discharge, 24 (92.3%) patients reported significant improvement of symptoms with only 7 (26.9%) reporting that they were at baseline health (symptom free).

The presence of symptoms in week 6 are presented in table 2. Respiratory symptoms were most common, reported in 23 patients (88.5%), most frequently cough, shortness of breath with exertion, sinus congestion, and chest tightness. Other common symptoms include fatigue (17 patients, 65%) and headache (13 patients, 50%). Less commonly reported, 9 patients (34.6%) had persistent gastrointestinal symptoms, 6 patients (23%) complained of palpitations, and 3 had persistent low-grade fevers. Of note, 18 (69.2%) reported at least 4 concurrent symptoms.

Due to the presence of persistent symptoms, 16 (61.5%) of patients delayed return to work at least five weeks from symptom onset, 17 (65.3%) delayed return to activity. The most common reasons cited for delayed return to work or activity was fatigue or weakness.

The majority of patients (73%) underwent further evaluation at one or more sites at least 3 weeks after symptom onset, either in emergency room (n=5, 26.3%), respiratory clinic (n=12, 63%), or telemedicine visit with specialist (n=4, 21%) or primary care provider (n=4, 21%). Common tests included chest X-ray (n=10), chest CT (n=7), labs (n=8), and echocardiogram (n=4). An alternate non-COVID-19 diagnosis was reached only for 1 patient (exacerbation of heart failure). A contributing diagnosis (to delayed improvement in COVID-19) was suspected for 13 patients (50%), most commonly allergic rhinitis (n=7, 58.3%), followed by asthma (n=5, 41.7%) and bronchiectasis in 2 patients (16.7%).

Discussion

Our data demonstrate that a subset of outpatients with mild COVID-19 will experience persistent symptoms, here defined as a period greater than 6 weeks. While the majority of patients identified in this study experienced impairment that limited usual activity, we found that most patients (92.3%) had an improving symptom course in the 6th week of symptoms, though long-term duration of symptoms is still unknown. A smaller proportion (26.9%) reported a return to baseline health by the time of discharge from VOMC.

In this cohort, the majority of patients sought further evaluation for their symptoms, with only one patient identified to have a non-COVID-19 alternate diagnosis. Importantly, in patients evaluated for persistent symptoms, a contributing atopic diagnosis or chronic lung disease was often suspected, which led to specific directed treatments. This possible association is also suggested by comparison of comorbidities between the prolonged symptom group and the overall VOMC cohort (table 1); the incidence of asthma and chronic lung disease (prospectively coded at intake visit) appear more frequent in the patients identified in the persistent symptom cohort for this study. Anecdotally, we note that many providers report that inhaled bronchodilators and corticosteroids are effective for prolonged COVID-19 symptoms (see video: <https://youtu.be/ecPjhdVf41k>) and our findings in this report strengthen the case for further research.

While respiratory symptoms (cough, dyspnea on exertion, and other) are most common, a variety of symptoms may present across organ systems including neurologic, cardiac, and

gastrointestinal. These manifestations merit further investigation as possible evidence of organ-specific dysfunction caused by “mild” COVID-19 in outpatients.

Limitations

Our data represent a specific population of patient who enrolled in a telemedicine program at a single center and may not be generalizable to other populations. Additionally, the request for ongoing follow-up calls was not standardized across the cohort so we cannot be certain which symptoms or functional status concerns prompted the continuation of care. It is therefore likely that our data does not capture all patients with persistent symptoms. In a separate phone-call survey project 4/148 (2.7%) non-hospitalized patients who were called after VOMC discharge (median symptom day 63) reported significant symptoms requiring ongoing medical care by primary care providers[8].

The study period (March-May 2020) overlapped with the spring pollen season in Georgia, which could explain the occurrence of contributing atopic diagnoses in this study. The peak pollen counts, however, occurred March 20 to April 10, and the dates of discharge of our prolonged symptom cohort from VOMC were April 24 to June 8 (median date: May 18); the median dates of the 6th week of symptoms used for our analysis were May 4 to May 11. Furthermore, the provider documentation used in our analysis attributed the symptoms to COVID-19 as the primary active diagnosis in all care plans except for a single “alternate diagnosis” case.

Conclusion

For a subset of patients with COVID-19 (4.8% in our cohort), symptom duration is more than 5 weeks and impacts their ability to return to work and activity. The most common persistent symptoms are respiratory in nature. These patients may be more likely to have underlying allergic and lung conditions than in the general telemedicine VOMC follow-up cohort. Further research is needed to determine the long-term effects of COVID-19 in patients with persistent symptoms.

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Patient Consent Statement

The study was approved by the Emory University Institutional Review Board (STUDY00000766), which granted a waiver of consent and a waiver of Health Insurance Portability and Accountability Act authorization. The study was carried out in accordance with the principles embodied in the Declaration of Helsinki.

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Author contributions

Both authors contributed to the concept and design of the study. JO performed the primary chart review and MC performed a secondary review. Both authors were involved in data interpretation. JO drafted the primary manuscript and both authors revised the manuscript critically for important intellectual content, and approved the final version of the manuscript.

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None

Conflicts of Interest

The authors have no conflicts of interest to declare. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

Table 1: Demographics and comorbid conditions		
	Prolonged* (n=26)	Non-prolonged (n=470)
Age category (years), n (%)		
18-29	2 (7.7%)	76 (16.2%)
30-39	5 (19.2%)	79 (16.8%)
40-49	7 (26.9%)	99 (21.1%)
50-59	7 (26.9%)	108 (23.0%)
60-69	2 (7.7%)	82 (17.4%)
≥70	3 (11.5%)	26 (5.5%)
Sex, n (%)		
Female	20 (76.9%)	310 (66.0%)
Male	6 (23.1%)	160 (34.0%)
Race, n (%)		
Black	14 (53.8%)	238 (50.6%)
White	5 (19.2%)	92 (19.6%)
Other/not recorded	7 (26.9%)	140 (29.8%)
Standard comorbidities from VOMC note, n (%)		
No comorbidity	6 (23.1%) [†]	174 (37.0%)
Age >60	5 (19.2%)	108 (23.0%)
BMI>30	14 (53.8%)	196 (41.7%)
Hypertension	9 (34.6%)	156 (33.2%)
Coronary artery disease	1 (3.8%)	19 (4.0%)
Diabetes	1 (3.8%)	65 (13.8%)
Immunosuppression [‡]	1 (3.8%)	26 (5.5%)
Chronic kidney disease	1 (3.8%)	14 (3.0%)
Lung Disease	3 (11.5%)	11 (2.3%)
Asthma	10 (42.3)	59 (12.6%)
Additional comorbidities[§], n (%)		
Allergies	9 (34.6%)	NR
Mood Disorder	6 (23.1%)	NR
Migraines	4 (15.4%)	NR
Autoimmune Disorder	4 (15.4%)	NR
Previous Tobacco use [¶]	5 (19.2%)	NR

Abbreviations: BMI = Body mass index; NR = Not recorded in standard VOMC template

*Prolonged defined as patients who continue VOMC for >3 weeks and extending >6 weeks beyond symptom onset. Non-prolonged is all other patients in the cohort which is presented for comparison (note that baseline characteristics of this cohort have been described in reference [7]).

[†]If including the "other" comorbidities identified in chart review (denoted § in table) the number is 1 (3.8%)

[‡]Use of biologic or other immunosuppressive medications including chronic corticosteroid at ≥20 mg prednisone daily, detectable HIV viral load or CD4 count <200 cells/mm³

[§]These comorbidities were coded from 'other' category on chart review of prolonged cohort.

[¶]No current smokers identified in the prolonged cohort.

Table 2: Symptoms reported by patients in 6th week

General	20 (76.9%)
Fever	3 (11.5%)
Chills	3 (11.5%)
Body aches	7 (26.9%)
Fatigue*	17 (65.4%)
Weakness*	7 (26.9%)
Joint pain	8 (30.8)
Sweats*	2 (7.7%)
Neurologic	23 (88.5%)
Loss of smell	8 (30.8)
Altered taste*	1 (3.8%)
Confusion	1 (3.8%)
Dizziness	3 (11.5%)
Headache	13 (50%)
Memory loss*	4 (15.4%)
Sleep disturbance*	7 (26.9%)
Anxiety*	8 (30.8)
Respiratory	23 (88.5%)
Sore throat	5 (19.2%)
Sinus congestion	12 (46.2%)
Cough	14 (53.8%)
Shortness of breath at rest	3 (11.5%)
Shortness of breath with exertion	13 (50%)
Wheezing	3 (11.5%)
Chest tightness	10 (42.3%)
Gastrointestinal	9 (34.6%)
Diarrhea	3 (11.5%)
Abdominal Pain	1 (3.8%)
Nausea	5 (19.2%)
Anorexia*	3 (11.5%)
Other	
Rash	1 (3.8%)
Palpitations*	6 (23.1%)
Total number of symptoms	
1-3	7 (26.9%)
4-6	13 (50%)
7-9	3 (11.5%)
10 or more	2 (7.7%)

*These symptoms identified from "other" category on chart review