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[Jennifer Zreloff](#), *Emory University*

[David Roberts](#), *Emory University*

[Sharon Bergquist](#), *Emory University*

[James O'Keefe](#), *Emory University*

[Miranda Moore](#), *Emory University*

C Partin, *Department of Medicine, Emory University, 1365 Clifton Rd, A1400, Atlanta, GA 30322 USA.*

EJ Tong, *Department of Medicine, Emory University, 1365 Clifton Rd, A1400, Atlanta, GA 30322 USA.*

TL Jarrett, *Department of Medicine, Emory University, 1365 Clifton Rd, A1400, Atlanta, GA 30322 USA.*

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Non-hospitalized Adults with COVID-19 Differ Noticeably from Hospitalized Adults in Their Demographic, Clinical, and Social Characteristics

Sharon H. Bergquist¹ · Clyde Partin¹ · David L. Roberts¹ · James B. O’Keefe¹ · Elizabeth J. Tong¹ · Jennifer Zreloff¹ · Thomas L. Jarrett¹ · Miranda A. Moore²

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Abstract

The characteristics of patients with coronavirus disease 2019 (COVID-19) have primarily been described in hospitalized adults. Characterization of COVID-19 in ambulatory care is needed for a better understanding of its evolving epidemiology. Our aim is to provide a description of the demographics, comorbidities, clinical presentation, and social factors in confirmed SARS-CoV-2-positive non-hospitalized adults. We conducted a retrospective medical record review of 208 confirmed SARS-CoV-2-positive patients treated in a COVID-19 virtual outpatient management clinic established in an academic health system in Georgia. The mean age was 47.8 (range 21–88) and 69.2% were female. By race/ethnicity, 49.5% were non-Hispanic African American, 25.5% other/unknown, 22.6% non-Hispanic white, and 2.4% Hispanic. Nearly 70% had at least one preexisting medical condition. The most common presenting symptoms were cough (75.5%), loss of smell or taste (63%), headache (62%), and body aches (54.3%). Physician or advanced practice provider assessed symptom severity ranged from 51.9% mild, 30.3% moderate, and 1.4% severe. Only eight reported limitations to home care (3.8%), 55.3% had a caregiver available, and 93.3% reported initiating self-isolation. Care needs were met for 83.2%. Our results suggest the demographic and clinical characteristics of COVID-19 illness in non-hospitalized adults differ considerably from hospitalized patients and warrant greater awareness of risk among younger and healthier individuals and consideration of testing and recommending self-isolation for a wider spectrum of clinical symptoms by clinicians. Social factors may also influence the efficacy of preventive strategies and allocation of resources toward the SARS-CoV-2 pandemic.

Keywords COVID-19 · SARS-CoV-2 · Non-hospitalized · Outpatient · Telemedicine · Characteristics · Comorbidities

Introduction

The first case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its associated clinical disease coronavirus disease 2019 (COVID-19) was reported in the United

States (US) in January 2020¹. As of May 13, 2020, over 1.36 million subsequent US cases have been confirmed, resulting in over 82,000 deaths². The characteristics of patients with COVID-19 have been detailed in a limited but rapidly growing literature of hospitalized patients. Reports from China^{3,4},

✉ Sharon H. Bergquist
shoresh@emory.edu

Clyde Partin
wpart01@emory.edu

David L. Roberts
drobe04@emory.edu

James B. O’Keefe
jbokeef@emory.edu

Elizabeth J. Tong
etong@emory.edu

Jennifer Zreloff
jzrelof@emory.edu

Thomas L. Jarrett
tljarre@emory.edu

Miranda A. Moore
miranda.moore@emory.edu

¹ Department of Medicine, Emory University, 1365 Clifton Rd, A1400, Atlanta, GA 30322, USA

² Department of Family and Preventive Medicine, Emory University, Atlanta, GA, USA

Italy⁵, and globally⁶ have found incidence and case fatality to be higher in older patients and those with pre-existing comorbid conditions. Studies from the US have similarly found higher population-based rates of COVID-19-related hospitalizations among older adults and those with underlying medical conditions⁷. Additionally, US-based hospitalization rates have shown over-representation of non-Hispanic black patients⁸. However, hospitalized patients with COVID-19 have been estimated to be less than 30% of total cases^{4, 5}. Seroprevalence data suggests far greater numbers of SARS-CoV-2 exposure in the ambulatory population⁹. To date, little is known about the demographic and clinical characteristics of patients with COVID-19 managed in the outpatient setting.

Similarly, the presenting symptoms of COVID-19 have been detailed among hospitalized patients^{3, 10–12}, but scant information is available about the spectrum and severity of clinical symptoms among patients suitable for outpatient management^{13–15}. Characterizing symptoms among non-hospitalized patients may guide more effective screening strategies¹⁶. Social and behavioral factors, such as limitations to self-care, availability of a caregiver, and practice of home isolation among non-hospitalized patients, have also not been described but are critical for understanding clinical outcomes, risk of complications, and the epidemiology of COVID-19. Our aim is to begin to fill the current gap in knowledge about outpatients with COVID-19 by presenting detailed demographic, clinical, and social characteristics of 208 non-hospitalized COVID-19 patients followed by a virtual outpatient management clinic in the Atlanta metropolitan area.

Methods

Study Setting and Population

The study was conducted within the Emory Healthcare Network, the largest academic health system in Georgia (primarily serving the greater Atlanta metropolitan area). As of May 14, 2020, the state of Georgia ranks 10th in the prevalence of COVID-19 cases in the US². In March 2020, Emory Healthcare created a virtual outpatient management clinic (VOMC) for COVID-19 patients. The aim was to provide proactive care and support to non-hospitalized patients and reduce in-person care escalation and within-health system viral transmission. Patients referred to the VOMC had confirmed positive results for SARS-CoV-2 ribonucleic acid (RNA) by polymerase chain reaction testing of a nasopharyngeal sample performed at an Emory Healthcare Network location. Testing was available by appointment following assessment by a nurse managed triage protocol. Due to limited supply of testing kits during the study time period, testing was restricted based on symptom severity and risk of complications and prioritized to healthcare employees. Patients were offered management through the VOMC at the time of test result notification.

Study Design

We conducted a retrospective medical record review using data collected in the electronic health record (Cerner, North Kansas City, MO) from the baseline evaluation of patients managed through the VOMC between March 24, 2020, and April 10, 2020. The baseline visit was performed via a secured videoconference or telephone visit with one of the physicians or advanced practice providers at the VOMC. We used descriptive statistics for each of the reported variables using StataSE 14 software (College Station, TX)¹⁷. This was a quality improvement study that met criteria for determination of non-human subject research by the Emory Institutional Review Board (IRB).

The data was structured by a medical record template that included fields for patient demographics, comorbid medical conditions, symptoms (description, course, severity, and duration), social factors (including self-care limitations, caregiver availability, isolation practices, and contact exposure), and a clinical assessment of risk for complications based on an internally developed guideline utilizing age, comorbid medical conditions, symptom severity, course of illness, and social factors. Patients were excluded from the analysis if they were missing demographic information ($n = 2$), if data did not pull correctly from the electronic health record ($n = 1$), or if they had a prior hospitalization for COVID-19 ($n = 7$).

Results

Demographic and Risk Exposure Summary

The 208 patients seen in the VOMC between March 24, 2020, and April 10, 2020, received testing between March 12, 2020, and April 9, 2020. The referring screening clinics tested 2766 patients for SARS-CoV-2 between March 12, 2020, and April 9, 2020, of whom 817 (29.5%) were positive. After exclusion criteria were applied, 208 (25.5%) COVID-19-positive patients were included in the study population. The mean age was 47.8 (SD 15.1) years, with nearly a quarter (24.5%) between the ages of 19 to 34 and 87.5% younger than 65 years (Table 1). The patients included more women (69.2%) than men (30.8%) and a greater proportion were non-Hispanic African American (49.5%) than non-Hispanic white (22.6%), Hispanic (2.4%), or other/unknown (25.5%). English was the primary language spoken by 67.8%. Most did not travel outside Georgia for 21 days prior to baseline evaluation (85.2%), and more than half did not have contact with a person known or suspected to be positive for COVID-19 (52.9% and 56.7%, respectively) (Table 1). Of those

Table 1 Demographic and clinical characteristics of COVID-19 VOMC patients

Characteristics	No. (%) of patients
Demographics	
Age, mean (SD) (range)	47.8(15.1)[21–88]
19–24	6 (2.9)
25–34	45 (21.6)
35–44	33 (15.9)
45–54	46 (22.1)
55–64	52 (25.0)
65–74	18 (8.7)
≥ 75	8 (3.8)
Sex	
Women	144 (69.2)
Men	64 (30.8)
Race	
Non-Hispanic white	47(22.6)
Non-Hispanic Black or African American	103 (49.5)
Hispanic	5 (2.4)
Other/unknown	53 (25.5)
Marital status	
Single	60 (28.8)
Married	71 (34.1)
Divorced, widowed, separated	12 (5.8)
Other/unknown	65 (31.3)
Primary language spoken	
English	141(67.8)
Other/unknown	67(32.2)
COVID-19 information	
Location of testing	
Emory outpatient screening site	151(72.6)
Emergency department	23(11.1)
Other/unknown	34(16.3)
Travel outside Georgia in the last 21 days	
No	177(85.1)
Yes: domestic	14(6.7)
Yes: unknown location	4(2.4)
Unknown travel	12(5.8)
Known contact with confirmed positive	
No	110(52.9)
Yes: family/household member	18(8.7)
Yes: community	7(3.4)
Yes: non-clinical work setting	19(9.1)
Yes: clinical work setting	36(17.3)
Unknown	18(8.7)
Known contact with suspected positive	
No	118(56.7)
Yes: family/household member	9(4.3)
Yes: community	6(2.9)
Yes: non-clinical work setting	9(4.3)
Yes: clinical work setting	24(11.5)
Unknown	42(20.2)

N = 208 patients seen in the Emory Healthcare COVID-19 Positive Virtual Outpatient Management Clinic 3/24/2020–4/10/2020

with known contact with a confirmed COVID-19-positive individual, the most common place of exposure was through work (26.4%) rather than home (8.7%) or in the community (3.4%). In our patients, since testing was preferentially offered to healthcare workers, a high percentage of those exposed through work (56.5%) were employed in a clinical setting.

Comorbidities

In this population of non-hospitalized adults with COVID-19, almost 70% reported at least one preexisting medical condition. In those reporting any preexisting medical condition, the most common were hypertension (37.5%), obesity with BMI ≥ 30 kg/m² (32.2%), asthma (16.8%), and diabetes mellitus (14.4%) (Fig. 1 and Appendix Table 4). Of note, hypertension and BMI < 40 kg/m² are not considered high risk conditions¹⁸. Other preexisting medical conditions included cancer (12.5%), immunosuppression (10.6%), chronic lung disease (5.8%), coronary arterial disease (4.8%), and chronic kidney disease (3.8%).

Symptoms and Severity

The most common presenting symptoms were cough (75.5%), loss of smell or taste (63%), headache (62%), and body aches (54.3%) (Fig. 2 and Appendix Table 5). Only 16.8% reported a fever but 45.2% experienced chills. Upper respiratory symptoms (sinus congestion 50%, sore throat 35.1%) and gastrointestinal symptoms (nausea 35.6%, diarrhea 37.5%, abdominal pain 13.5%) were common. Dizziness (32.7%), joint pains (27.9%), chest tightness (35.6%), shortness of breath at rest (15.4%), confusion (3.8%), and rash (3.4%) were also reported. Most patients rated their symptoms as mild (51.9%) and improving (58.7%) (Table 2). At the time of evaluation, the symptoms reported to have lasted the longest in duration were cough (mean 8.9 days, SD 5.8), sinus congestion (mean 8.4 days, SD 5.9), and loss of smell or taste (mean 7.1 days, SD 3.5). All other symptoms were reported to have resolved within 1 week. The percentage of patients without any symptoms was 10.1%.

The risk for medical complications assessed at the time of baseline evaluation was low for 45.2% of patients, medium for 37%, and high for 17.8%. The overall risk of complications, based on an internally created guideline that used age, social factors, underlying medical condition, and illness severity, was assessed by the intake medical provider to be low in 45.7%, medium in 37%, and high in 17.3% of patients (Table 2).

Social Characteristics

While most people (96.2%) did not have a limitation to home care, such as a restriction due to mobility, memory, mental health, socioeconomic, food availability, or other causes, only slightly more than a half (55.3%) had a caregiver available (Table 3). Caregivers were most often a significant other (22.5%) or alternative family member (28.8%). Most (91.4%) lived with one or more household members, with a quarter (25.5%) living with 4 or more people. Nearly a fourth of household members (22.1%) had an underlying high-risk medical condition. Self-isolation was reported by 93.3% of patients, with the majority initiating self-isolation either before

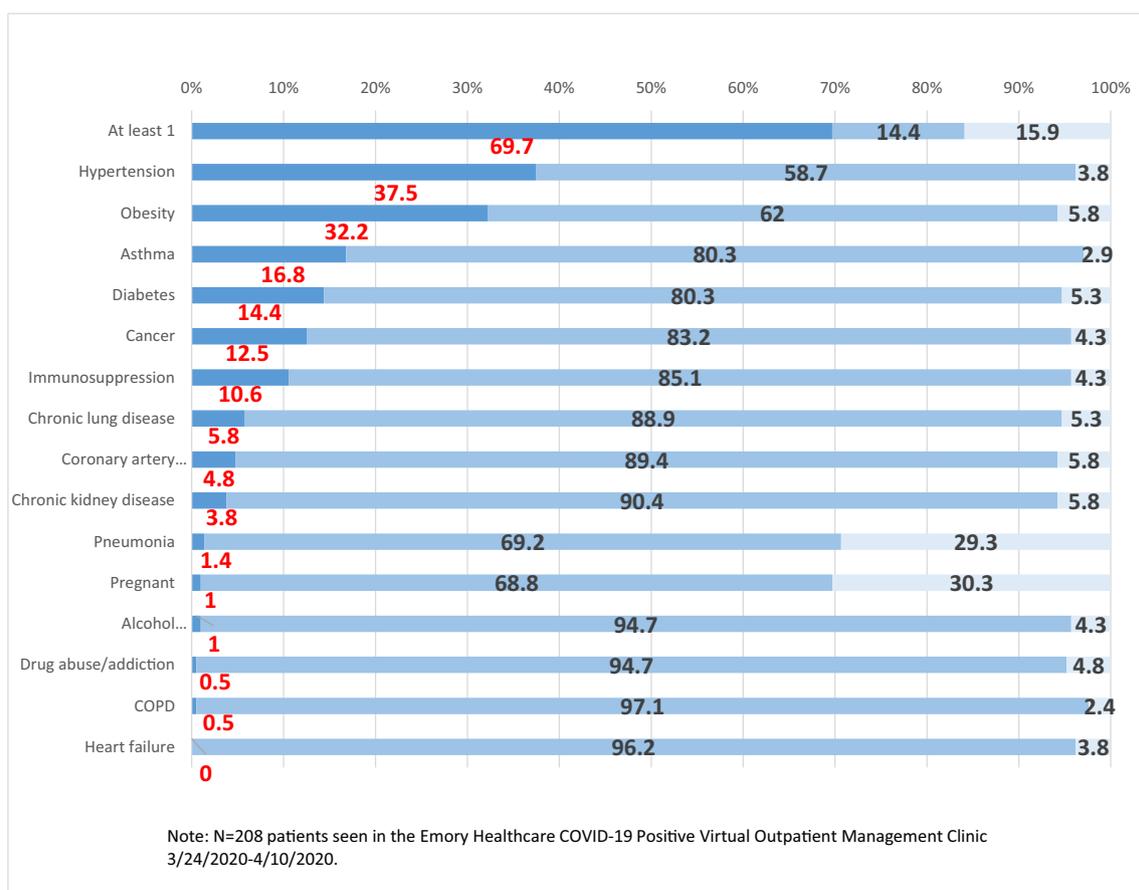


Fig. 1 Comorbidities of COVID-19 VOMC patients. Percentage with comorbidity (x-axis). Type of comorbidity (y-axis). Color key: Yes/No/Unknown

(63%) or upon testing (20.2%). During baseline evaluation, fewer than five patients (<2.4%) were assessed to be inappropriate for outpatient management and 83.2% had their care needs adequately met per clinical judgment.

Discussion

Characterization of COVID-19 patients has thus far been primarily limited to hospitalized patients. Our results suggest that demographic and clinical characteristics of COVID-19 may differ in non-hospitalized patients. Hospitalized patients in the US have been mostly older adults, with median age 60 years or higher, with underlying medical conditions, in up to 94% of cases when non-high-risk conditions have been included^{7, 10}. In contrast, 87.5% of patients in our outpatient population were younger than 65 years old and 30.3% did not have an underlying medical condition, with the inclusion of non-high risk conditions¹⁸. With over 70% of those with COVID-19 illness managed outside the hospital setting^{4, 5}, our findings raise the possibility that the risk of severe illness may be higher in medically vulnerable older people while the prevalence of mild and moderate COVID-19 illness may be higher in younger, healthier individuals. The demographic and

clinical characteristics of our patients reinforce the need for all adults, regardless of age or underlying medical condition, to consider themselves at risk for COVID-19 illness. Additionally, prior studies have shown higher rates of hospitalization among men and African Americans^{7, 8}. The higher prevalence of comorbidities among African-Americans may contribute to the disproportionate number of cases and mortality, with higher obesity trends alone among African-Americans having been associated with increased mortality in COVID-19 patients¹⁹. In our non-hospitalized COVID-19 patients, however, most were female (69.2%) and African Americans were not over-represented relative to the population demographics of the Atlanta metropolitan area (49.5% in study versus 51.8% city of Atlanta²⁰). Further investigation is needed to understand the risk associated with gender and race/ethnicity across the continuum of COVID-19 illness.

The most common signs and symptoms of COVID-19 illness, present in more than half of hospitalized patients, have included cough, fever, and dyspnea^{7, 12}. In our non-hospitalized patients, 75.5% had cough but clinical presentation differed in that loss of smell or taste (63%), headache (62%), and body aches (54.3%) were among the most common symptoms. Interestingly, fever was not frequently reported (16.8%), but we did not query regarding the use of

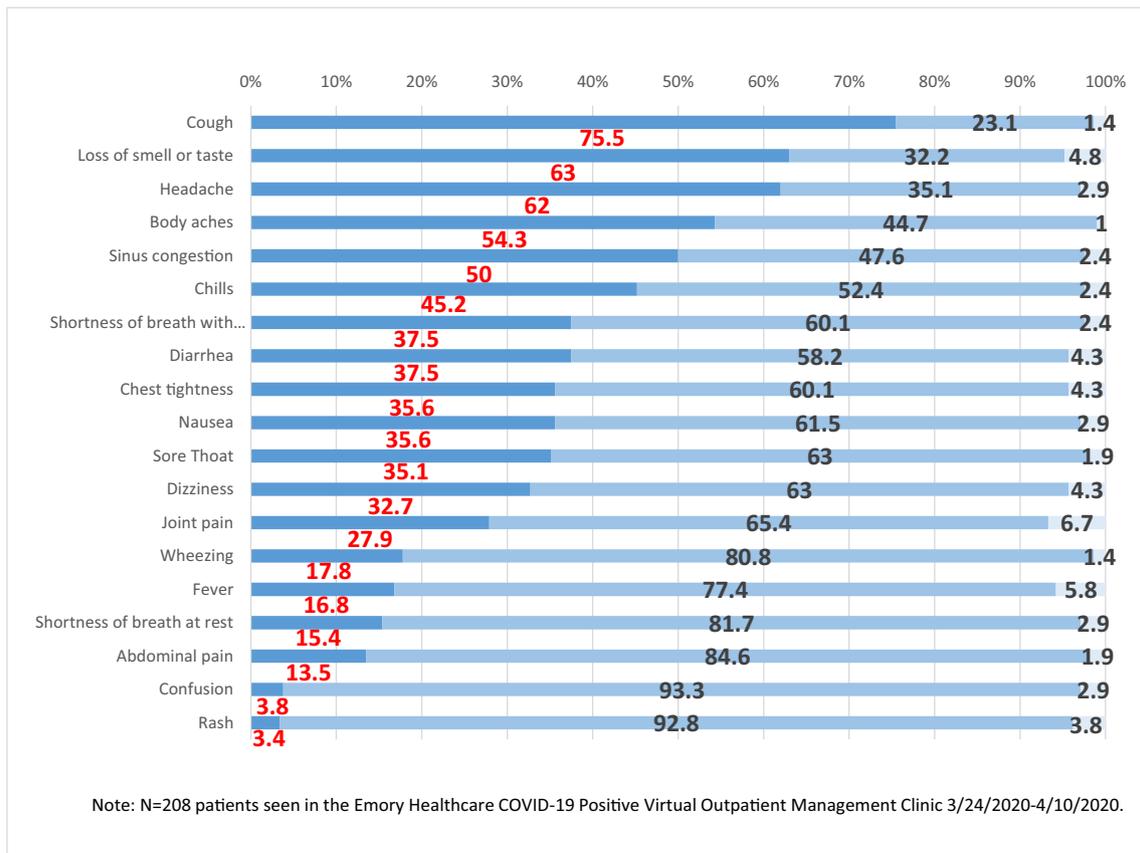


Fig. 2 Clinical symptoms of COVID-19 VOMC patients. Percentage with symptom (x-axis). Type of symptom (y-axis). Color key: Yes/No/Unknown

antipyretics. The high prevalence of loss of smell or taste was similar to that previously reported in a mildly symptomatic outpatient COVID-19 population¹³ and may be attributed to the highest expression of the SARS-CoV-2 receptor, angiotensin-converting enzyme 2, being in nasal epithelial cells²¹. In this group of mostly mild to moderately ill patients, at least a third presented with upper respiratory symptoms (sinus congestion 50%, sore throat 35.1%), gastrointestinal symptoms (nausea 35.6%, diarrhea 37.5%), dizziness (32.7%), or chest tightness (35.6%). The wide range of presenting symptoms in the outpatient setting warrants increased awareness about the diverse manifestations of COVID-19 illness and may support a broader indication for testing and self-isolation. The percentage of asymptomatic patients in this study may be under-represented relative to the general population due to limited supply of test kits available during the study period.

Self-isolation is a key component of community mitigation efforts²². Previous studies have shown that socioeconomic factors, such as concern over loss of compensation, may affect compliance with public health isolation recommendations²³. A key strength of our study is the description of social characteristics that may influence care outcomes and adherence to preventive strategies. In our patients, 93.3% self-reported that they were following home isolation measures. However,

32.7% did not have an available caregiver, which may reduce the ability to strictly adhere to home isolation. In the future, a better understanding of factors contributing to non-compliance with mitigation strategies is needed to assess feasibility and efficacy of current public health recommendations. Additionally, we found that over half of the people with COVID-19 did not have known contact with a person confirmed or suspected to be positive for SARS-CoV-2. This supports the need for maintaining vigilance about social distancing to reduce viral transmission. Further inquiry about the suspected place or person of potential exposure may be informative for future studies. Lastly, our population was diverse, with potentially up to a third (32.2%) speaking a language other than English as their primary language. Consideration should be given for designing public health messaging that reflects the cultural and language backgrounds of local communities.

Limitations

This study had several limitations. Our sample was relatively small and limited to one geographic location. The patients do not necessarily represent all patients testing positive for SARS-CoV-2 infection in the Emory Healthcare Network or within Georgia. Therefore, our results may not be

Table 2 Risk assessment factors of COVID-19 VOMC patients

Factor	No. (%) of patients
Age > 60	
No	160 (76.9)
Yes	48 (23.1)
Underlying pertinent medical condition per clinician judgment	
No	88 (42.3)
Yes	120 (57.7)
Immunosuppression	
No	187 (89.9)
Yes	21 (10.1)
Inadequate care available	
No	200 (96.2)
Yes	8 (3.8)
Severity of symptoms	
None	21 (10.1)
Mild	108(51.9)
Moderate	63(30.3)
Severe	3(1.4)
Unknown	13(6.3)
Symptom course	
Improving	122(58.7)
Stable	51(24.5)
Worsening	14(6.7)
Unknown	21(10.1)
Care needs can be adequately met	
No	4(1.9)
Yes	173(83.2)
Unknown	31(14.9)
Risk for medical complications	
Low risk	94(45.2)
Medium risk	77(37.0)
High risk	37(17.8)
Overall risk for complications (based on age, medical, and social factors)	
Low risk (Tier 1)	95(45.7)
Medium risk (Tier 2)	77(37.0)
High risk (Tier 3)	36(17.3)

N = 208 patients seen in the Emory Healthcare COVID-19 Positive Virtual Outpatient Management Clinic 3/24/2020–4/10/2020

generalizable to other populations. Testing restrictions during the study time period may have also led to a higher proportion of symptomatic adults and healthcare workers relative to SARS-CoV-2 infection in the general outpatient population. Our method of data collection included medical record information and patient-reported history. The latter, as a result of reliance on recollection and inadvertent biases, may have led to inaccuracies in descriptions or durations of presenting symptoms and omissions or misclassifications of comorbidities. The cross-sectional design of this study also

Table 3 Social background of COVID-19 VOMC patients

Characteristics	No. (%) of patients
Limitations to home care	
None	200 (96.2)
At least 1 identified	8 (3.8)
Caregiver available	
No	68 (32.7)
Yes	115 (55.3)
Significant other	47 (22.6)
Other family member	60 (28.8)
Friend	6 (2.9)
Unknown	25 (12.0)
Number of family/contacts living in same residence	
None	5 (2.4)
1	38 (18.3)
2	59 (28.4)
3	40 (19.2)
≥ 4	53 (25.5)
Unknown	13 (6.3)
Household members with high-risk medical conditions	
No	141 (67.8)
Yes	46 (22.1)
Unknown	21 (10.1)
Isolation	
Yes: prior to testing	131 (63.0)
Yes: upon testing	42 (20.2)
Yes: prior to notification of status	11 (5.3)
Yes: upon notification of status	10 (4.8)
Unknown	14 (6.7)

N = 208 patients seen in the Emory Healthcare COVID-19 Positive Virtual Outpatient Management Clinic 3/24/2020–4/10/2020

limits the ability to make conclusions about causality, course of illness, or patient outcomes.

Conclusions

In summary, our findings suggest that the demographic and clinical characteristics of non-hospitalized adults with COVID-19 illness differ from hospitalized patients with regard to age, gender, race/ethnicity, and prevalence of underlying medical conditions. Our results support the need for greater awareness of risk among younger and healthier individuals and for consideration of testing and recommending self-isolation for a wide spectrum of clinical symptoms by clinicians. Additionally, we found characterization of social factors informative for understanding feasibility of outpatient management, patient outcomes, and compliance with community mitigation strategies. Future studies on outpatient

populations with COVID-19 are needed to better understand the epidemiology and manifold characteristics of COVID-19 illness.

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Acquisition, analysis, or interpretation of data: MM, SB.

Drafting of the manuscript: SB, MM.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: MM.

Final approval of the submission: All authors.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

Meeting Presentations None.

Data Sharing Statement N/A.

Appendix

Table 4 Comorbidities of COVID-19 VOMC patients

Condition	No. (%) of patients
Any condition	
None of these	30 (14.4)
At least 1 of these	145 (69.7)
Unknown	33 (15.9)
Chronic lung disease	
No	185 (88.9)
Yes	12 (5.8)
Unknown	11 (5.3)
Asthma	
No	167 (80.3)
Yes	35 (16.8)
Unknown	6 (2.9)
COPD	
No	202 (97.1)
Yes	1 (0.5)
Unknown	5 (2.4)
Diabetes	
No	167 (80.3)
Yes	30 (14.4)

Table 4 (continued)

Condition	No. (%) of patients
Unknown	11 (5.3)
Chronic kidney disease	
No	188 (90.4)
Yes	8 (3.8)
Unknown	12 (5.8)
Immunosuppression	
No	177 (85.1)
Yes	22 (10.6)
Unknown	9 (4.3)
Hypertension	
No	122 (58.7)
Yes	78 (37.5)
Unknown	8 (3.8)
Coronary arterial disease	
No	186 (89.4)
Yes	10 (4.8)
Unknown	12 (5.8)
Heart failure	
No	200 (96.2)
Yes	0 (0.0)
Unknown	8 (3.8)
Obesity (BMI \geq 30)	
No	129 (62.0)
Yes	67 (32.2)
Unknown	12 (5.8)
Alcohol abuse/addiction	
No	197 (94.7)
Yes	2 (1.0)
Unknown	9 (4.3)
Drug abuse/addiction	
No	197 (94.7)
Yes	1 (0.5)
Unknown	10 (4.8)
Cancer	
No	173 (83.2)
Yes	26 (12.5)
Unknown	9 (4.3)
Pneumonia	
No	144 (69.2)
Yes	3 (1.4)
Unknown	61 (29.3)
Pregnancy	
No	142 (68.3)
Yes	2 (1.0)
N/A	64 (30.8)

$N=208$ patients seen in the Emory Healthcare COVID-19 Positive Virtual Outpatient Management Clinic 3/24/2020–4/10/2020

Table 5 Clinical symptoms of COVID-19 VOMC patients

Symptom	No. (%) of patients Mean (SD)
Fever	
No	161 (77.4)
Yes	35 (16.8)
Unknown	12 (5.8)
Duration (days)	6.5 (3.7)
Sore throat	
No	131 (63.0)
Yes	73 (35.1)
Unknown	4 (1.9)
Duration (days)	5 (4.3)
Chills	
No	109 (52.4)
Yes	94 (45.2)
Unknown	5 (2.4)
Duration (days)	5.6 (4.6)
Body aches	
No	93 (44.7)
Yes	113 (54.3)
Unknown	2 (1.0)
Duration (days)	5.9 (4.1)
Sinus congestion	
No	99 (47.6)
Yes	104 (50.0)
Unknown	5 (2.4)
Duration (days)	8.4 (5.9)
Cough	
No	48 (23.1)
Yes	157 (75.5)
Unknown	3 (1.4)
Duration (days)	8.9 (5.8)
Shortness of breath at rest	
No	170 (81.7)
Yes	32 (15.4)
Unknown	6 (2.9)
Duration (days)	5.1 (3.2)
Shortness of breath with exertion	
No	125 (60.1)
Yes	78 (37.5)
Unknown	5 (2.4)
Duration (days)	6.5 (3.6)
Wheezing	
No	168 (80.8)
Yes	37 (17.8)
Unknown	3 (1.4)
Duration (days)	5.4 (4.4)
Chest tightness	
No	125 (60.1)
Yes	74 (35.6)
Unknown	9 (4.3)
Duration (days)	6.3 (3.7)
Confusion	
No	194 (93.3)
Yes	8 (3.8)
Unknown	6 (2.9)
Duration (days)	2.8 (2.9)
Dizziness	
No	131 (63.0)
Yes	68 (32.7)
Unknown	9 (4.3)
Duration (days)	3.4 (2.5)
Headache	
No	73 (35.1)
Yes	129 (62.0)
Unknown	6 (2.9)

Table 5 (continued)

Symptom	No. (%) of patients Mean (SD)
Duration (days)	6.7 (5.1)
Diarrhea	
No	121 (58.2)
Yes	78 (37.5)
Unknown	9 (4.3)
Duration (days)	4.1 (3.1)
Abdominal pain	
No	176 (84.6)
Yes	28 (13.5)
Unknown	4 (1.9)
Duration (days)	4.3 (5.3)
Nausea	
No	128 (61.5)
Yes	74 (35.6)
Unknown	6 (2.9)
Duration (days)	5.3 (5.7)
Rash	
No	193 (92.8)
Yes	7 (3.4)
Unknown	8 (3.8)
Duration (days)	7 (5.9)
Joint pain	
No	136 (65.4)
Yes	58 (27.9)
Unknown	14 (6.7)
Duration (days)	6.2 (4.5)
Loss of smell or taste	
No	67 (32.2)
Yes	131 (63.0)
Unknown	10 (4.8)
Duration (days)	7.1 (3.5)

N = 208 patients seen in the Emory Healthcare COVID-19 Positive Virtual Outpatient Management Clinic 3/24/2020–4/10/2020

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