Coronavirus Related Mortality in the Geriatrics Ambulatory Practice

Claudene J. George¹ and Alice Guo¹

Abstract

Background: Older adults often have atypical presentations of common diseases and COVID-19 is no exception. Presentations range from asymptomatic to overwhelming symptoms that result in hospitalization, intubation, or death. The number of COVID-19 related deaths among older adults in the outpatient practice during the peak of the pandemic is unclear. Methods: The objective is to describe the COVID-19 status and clinical characteristics of patients in a Geriatrics Ambulatory Practice who died during the peak of the COVID-19 pandemic. Design: Retrospective chart review Participants: 54 adults age 65 years and older. Methods: COVID-19 status defined by positive test result and presumed COVID-19 status based upon clinical presentation. Results: Out of 1200 active patients in the Geriatrics Ambulatory Practice, 54 (4.5%) died between January 1st, 2020 and June 30th, 2020. The study sample was 63% female, 33% Hispanic/Latino, 27% Black/African American, and 22% white. The mean (SD) age was 86(8.6) years, range (72-107 years). The most prevalent medical comorbidities in decreasing order of frequency were hypertension (88.9%), diabetes (51.9%), and cognitive impairment (51.9%). Nineteen (35%) were COVID-19 positive and 8 had presumed COVID-19. There were no statistically significant differences in age, gender, race/ethnicity, and medical comorbidities between the COVID-19 or presumed COVID-19 group compared to those with No COVID-19. Conclusion: Approximately 35% of Geriatric patients who died during the first 6 months of 2020 had confirmed COVID-19 and an additional 15% had presumed COVID-19. The actual number of COVID-19 related deaths among older adults in the ambulatory practice during the peak of the pandemic is difficult to estimate and likely underestimated.

Keywords

COVID-19, geriatrics, mortality, ambulatory practice, health outcomes

Dates received: 16 March 2021; revised: 26 May 2021; accepted: 27 May 2021.

Introduction

Older adults and those with chronic medical conditions are particularly susceptible to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or COVID-19. According to the Centers for Disease Control (CDC) 8 out of 10 COVID-19 related deaths in the United States are among individuals 65 years and older.¹ Symptoms of COVID-19 can appear 2 to 14 days after exposure and can range from fever and chills, cough, shortness of breath, fatigue, muscle aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea.² Older adults often have atypical presentations of common diseases and COVID-19 is no exception. Patients can be asymptomatic, have vague symptoms that are not respiratory in origin, or have an overwhelming presentation that requires hospitalization, intubation, or can lead to death.³ Patients with dementia may simply have a change in behavior such as increased agitation or confusion,⁴ making it challenging for caregivers and physicians to determine how aggressively to investigate or triage such patients for further evaluation. It is unclear if presentations that were consistent with COVID-19 were deemed to be unrelated early in the pandemic. The number of COVID-19 related deaths among older adults in the outpatient practice during the peak of the pandemic is unclear and perhaps underestimated. Therefore, the objectives of the present study are to describe the COVID-19 status of patients in a Geriatrics Ambulatory Practice who died during the first 6-month period of the COVID-19 pandemic, and to compare the clinical characteristics of patients who died of COVID-19.

¹Albert Einstein College of Medicine, Bronx, NY, USA

Corresponding Author:
Claudene J. George, Montefiore Medical Center, Division of Geriatrics, Albert Einstein College of Medicine, 111 East 210th Street, Bronx, NY 10467, USA.
Email: Cjgeorge@montefiore.org

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to patients whose deaths were not COVID-19 related. A better understanding of the characteristics and presentations of patients who died from COVID-19 could help clinicians to consider COVID-19 in the differential diagnosis even when patients present with symptoms that may not be respiratory in origin.

Methods

This retrospective chart review was conducted at the Geriatrics Ambulatory Practice of an Academic Institution. The practice serves a diverse group of approximately 1200 community dwelling older adults who are 65 years or older. Approval was obtained from the Institutional Review Board. Providers were asked to identify patients in their panels who died of any cause between January 1st, 2020 to June 30th, 2020. This 6-month period was chosen in order to include deaths that were unrelated to the pandemic, to ensure that COVID-19 cases would not be missed and to allow for a comparison group of non-COVID-19 related deaths. Furthermore, the 6-month interval allowed for an estimate of the number of deaths that occurred in the months prior the start of the pandemic. In order to capture additional patients who might not have been captured by the primary care provider, a query was also performed in the Electronic Health Record (EHR) to identify all patients who were seen for a home visit or at the Geriatrics Ambulatory Practice within the last year who were documented as deceased. Furthermore, after July 2020, a second request was made to physicians to review their patient panels to determine if they were notified of patient deaths occurring between January 1st and June 30th that were not previously reported. Patients who were seen for a consult visit were not included. One investigator (CJG) examined the medical records to identify COVID-19 status, clinical characteristics, and reported symptoms just prior to death.

The main outcome measure was COVID-19 status categorized as positive or negative based upon SARS-CoV-2 PCR or antibody testing. The chart was further examined for the presence of both pulmonary and extrapulmonary symptoms consistent with COVID-19 including fever, chills, cough, shortness of breath, fatigue, muscle aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea, in order to capture patients with presumed COVID-19. Patients who were not tested for COVID-19, and had symptoms consistent with COVID-19 were categorized as “presumed COVID-19.” Presumed COVID-19 cases were likely true COVID-19 cases based upon symptomology, but these patients did not receive SARS-CoV-2 PCR or antibody testing. Both confirmed COVID-19 positive patients (by testing) and “presumed COVID-19” patients were compared to the No COVID-19 category of patients in Table 1. Patients who died during the months of January or February were excluded from the “presumed COVID-19” categorization given that the first reported case of COVID-19 in New York City was March 1st, 2020.

Additional data abstracted from the medical records included sociodemographic characteristics (age, gender, race/ethnicity) and clinical characteristics such as presence of diabetes, hypertension, cognitive impairment, chronic kidney disease, and lung disease. Characteristics of participants were compared using descriptive statistics; two-sample T-test for continuous variables and Chi Square test for categorical variables. Model assumptions were examined and met. All tests are two-sided with significance level .05. Data Analysis was performed using SPSS version 25.

Results

Out of 1200 active patients in the Geriatrics outpatient practice, 54 (4.5%) died between January 1st, 2020 to June 30th, 2020. Table 1 lists the demographic and clinical characteristics of the sample. The mean (SD) age was 86(8.6) years, range (72-107 years). The prevalence of specific medical comorbidities in decreasing order of frequency was hypertension (88.9%), diabetes (51.9%), cognitive impairment (51.9%), chronic kidney disease (40.7%), congestive heart failure (22.2%), and chronic obstructive pulmonary disease or asthma (18.5%). Three participants (5.6%) had end stage renal disease and 17 (31.5%) had a diagnosis of dementia. Eight percent of patients were part of the Geriatrics home visiting program. The location of death for most patients was the hospital (66.7%) and 31.5% died at home (Table 1). The peak number of deaths occurred in April (n = 23), then fewer amounts during other months: May (n = 9), February (n = 6), March (n = 5), January (n = 5), and June (n = 3). There were 3 patients whose month of death was unclear since they died at some point between the months of March to April (n = 2) and January to February (n = 1).

Among the 54 patients who died, 19 (35%) were COVID-19 positive confirmed by testing. An additional 8 were not tested for COVID-19 but had symptoms or exposures suggestive of a COVID-19 illness (respiratory symptoms [n = 4], new malaise, weakness and poor oral intake without obvious source [n = 3], and cardio pulmonary arrest when found by emergency medical services [n = 1]) and were categorized as presumed COVID-19 positive. The remaining 27 patients were categorized as having No COVID-19. The clinical characteristics of patients categorized as COVID-19 or presumed COVID-9 compared to those with No COVID-19 is shown in Table 1. There were no statistically significant differences between the two groups.

Discussion

Though 35% of Geriatric patients who died during the first 6 months of 2020 had confirmed COVID-19, the actual number of COVID-19 related deaths is closer to 50% when
one considers both presumed and confirmed cases of COVID-19. This highlights the significant impact of the pandemic on the geriatric outpatient sample. During the peak of the pandemic in New York City, there was an excess of 18 deaths during the month of April in comparison to an average of 5 deaths in the preceding month.

It was hypothesized that those who died of a COVID-19 related illness would be of more advanced age and that the prevalence of certain conditions such as diabetes and hypertension would be higher among those who died of presumed or confirmed COVID-19 than those who died of other causes. This was not the case. Geriatrics patients who died with COVID-19 or presumed COVID-19 were not significantly different with respect to medical comorbidities, age, gender, and race/ethnicity when compared to those who died of other causes. This was an unexpected finding. It is likely that the patients' clinical characteristics had more of an impact on their deaths than the presence or absence of a COVID-19 infection. The patients were vulnerable, and while COVID-19 could have accelerated the onset their deaths, it is also likely that another illness could have also resulted in their deaths. This is important to note because clinicians wondered if they could have prevented the deaths of their patients by making note of the clinical characteristics of those who died of COVID-19 compared to those who died of other causes.

Estimating the true prevalence of deaths from COVID-19 in the outpatient setting is challenging for a number of reasons. Approximately 30% of patients in this sample died at home. Many patients who died at home were not tested for COVID-19 and were treated symptomatically for presumed COVID-19 based upon the presence of respiratory symptoms.

During the early months of the pandemic, it was not known that extrapulmonary symptoms could be related to COVID-19. The retrospective nature of this study allowed for consideration of extrapulmonary symptoms in the designation of the “presumed COVID-19” category. More recent publications have highlighted extrapulmonary symptoms such as myalgia and fatigue, anorexia, diarrhea, acute kidney injury, thrombocytopenia, myocardial ischemia, and rashes unrelated to recent drug exposure as presenting symptoms or complications of COVID-19.

The healthcare system was overwhelmed and healthcare resources such as emergency department and hospital beds, personal protective equipment, and ventilators were limited. Many outpatient sites were closed for in-person visits. Many patients with new symptoms did not present to the emergency department, urgent care or to the outpatient practice for evaluation or testing. In most cases, telephonic visits were provided, and symptoms were managed at home. Patients with any illness had limited direct interaction with

| Table 1. Baseline Characteristics of COVID-19 and Non-COVID-19 Patients Who Died. |
|----------------|----------------|----------------|----------------|
|                | Total          | COVID-19*      | No Covid-19    |
| N=54           | N=27           | N=27           | P value        |
| Age, years     | 86 ± 8.6       | 84 ± 8.0       | 87 ± 9.0       | .278          |
| Gender         |                |                |                |
| Female (n, %)  | 34 (63.0)      | 14 (51.9)      | 20 (74.1)      | .158          |
| Race/ethnicity |                |                |                |
| Black          | 15 (27.8)      | 7 (25.9)       | 8 (29.6)       | .214          |
| Hispanic       | 18 (33.3)      | 10 (37.0)      | 8 (29.6)       |              |
| Asian          | 3 (5.6)        | 3 (11.1)       | 0 (00.0)       |              |
| White          | 12 (22.2)      | 4 (14.8)       | 8 (29.6)       |              |
| Not reported   | 6 (11.1)       | 3 (11.1)       | 3 (11.1)       |              |
| Comorbidities  |                |                |                |
| Hypertension   | 48 (88.9)      | 25 (92.6)      | 23 (85.2)      | .669          |
| Diabetes       | 28 (51.9)      | 14 (51.9)      | 14 (51.9)      | 1              |
| Cognitive Impairment | 28 (51.9) | 14 (51.9) | 14 (51.9) | .607 |
| Chronic Kidney Disease | 22 (40.7) | 10 (54.5) | 12 (44.4) | .782 |
| Congestive Heart Failure | 12 (22.2) | 3 (11.1) | 9 (33.3) | .099 |
| Chronic obstructive pulmonary disease/asthma | 10 (18.5) | 6 (22.2) | 4 (14.8) | .728 |
| Stroke         | 7 (13.0)       | 4 (14.8)       | 3 (11.1)       | .5            |
| Home visit     | 8 (14.8)       | 3 (11)         | 5 (18.5)       | .704          |
| Location of death |          |                |                |
| Hospital death | 36 (66.7)      | 20 (74.1)      | 16 (44.4)      | .307          |
| Home           | 17 (31.5)      | 7 (25.9)       | 10 (37)        |              |
| Unknown        | 1 (1.9)        | 0 (0.0)        | 1 (3.7)        |              |

*Includes confirmed COVID-19 positive (n = 19) and presumed COVID-19 positive (n = 8).
the healthcare system thereby prohibiting investigation and treatment of reversible conditions unrelated to COVID-19. It would be reasonable to consider an additional category called “COVID-19 associated deaths” for patients without COVID-19 who could not efficiently engage with the healthcare system and were casualties during the peak of the pandemic. A recent analysis reported that only 65% of excess deaths reported in the US between March 1st, 2020 and April 25th, 2020 were linked to COVID-19.6

This study has a number of limitations. As with most retrospective chart reviews, there was a high reliance on physician documentation in the medical chart. It is possible that there was misclassification of presumed COVID-19 and No COVID-19, but efforts were made to be as conservative as possible. Patients may have sought care outside of the primary care provider’s hospital network thereby limiting access to information about death or cause of death for patients who were hospitalized. Deaths occurring at home could have been missed, however this was less likely since primary care providers receive notification of deaths at home so that a death certificate can be completed.

Conclusions and Implications
The actual number of COVID-19 related deaths among older adults in the ambulatory practice during the peak of the pandemic is difficult to estimate and likely underestimated. Given the similarities in clinical characteristics and medical comorbidities among those who died of COVID-19 and those who died of other causes, as well as the limitation in accessing available healthcare resources; it is unclear if further evaluation in the outpatient setting or urgent care setting would have changed patient outcomes during the peak of the pandemic. Clinicians should broaden their differential diagnosis early to include the possibility of a COVID-19 related illness. Since all participants in this sample had an outcome of death, further investigation to compare the COVID-19 and presumed COVID-19 patients to those who survived the illness would be helpful in further identifying risk factors for death. Early identification of patients who are at risk could lead to more thorough discussions of the goals of care and expectations and allow clinicians to make more informed decisions about resource allocation.

Acknowledgments
We thank the patients and their families and the physicians who responded to questions and provided care to the patients. CG contributed in conceptualization, data entry and analysis, and manuscript writing and editing. AG contributed to manuscript writing and editing.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD
Claudene J. George https://orcid.org/0000-0002-0710-027X

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