Epidemiology, Clinical Characteristics, and Outcomes of a Large Cohort of COVID-19 Outpatients in Michigan

Alexandra Halalau (ahalalau@beaumont.edu)  
Beaumont Health  
https://orcid.org/0000-0002-1805-992X

Fadi Odish  
Beaumont Health

Zaid Imam  
Beaumont Health

Aryana Sharrak  
Oakland University William Beaumont School of Medicine

Evan Brickner  
Oakland University William Beaumont School of Medicine

Paul B. Lee  
Oakland University William Beaumont School of Medicine

Adam Foglesong  
Beaumont Health

Adrian Michel  
Beaumont Health

Inayat Gill  
Beaumont Health

Lihua Qu  
Beaumont Health

Amr E. Abbas  
Beaumont Health

Christopher Carpenter  
Beaumont Health

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Abstract

Background: Most individuals with COVID-19 do not initially demonstrate severe features requiring hospitalization. Understanding this population's epidemiological and clinical characteristics to allow outcome anticipation is crucial in healthcare resource allocation. We aim at describing the epidemiology, clinical characteristics and associated outcomes of high-risk patients diagnosed with COVID-19 at the largest healthcare system in Michigan.

Methods: Retrospective, multicenter (8 hospitals) study reporting on 821 patients diagnosed with COVID-19 by real-time reverse transcriptase–polymerase chain reaction (RT-PCR) assay of nasopharyngeal swabs and discharged home to self-isolate after evaluation in Emergency Departments (EDs) within Beaumont Health System in March, 2020. Outcomes were collected through April 14, 2020, with a minimum of 12 day follow up and included subsequent ED visit, admission status, and mortality.

Results: Of the 821 patients, mean age was 49.3 (SD 15.7), 46.8% were male and 55.1% were African-American. Cough was the most frequent symptom in 78.2% of patients with a median duration of 3 days (IQR 2-7), and other symptoms included fever 62.1%, rhinorrhea or nasal congestion 35.1% and dyspnea 31.2%. ACEI/ARBs usage was reported in 28.7% patients and 34.0% had diabetes mellitus. Return to the ED for re-evaluation was reported in 19.2% of patients from whom 54.4% were admitted. The patients eventually admitted to the hospital were older (mean age 54.4 vs 48.7, p=.002), had higher BMI (35.4 vs 31.9, p=.004), were more likely male (58.1% vs 46.8%, p=.026), and more likely to have hypertension (52.3% vs 29.4%, p<0.001), diabetes mellitus (74.4% vs 29.3%, p<0.001) or prediabetes (25.6% vs 8.4%, p<0.001), COPD (39.5% vs 5.4%, p<0.001), and OSA (36% vs 19%, p<0.001). The overall mortality rate was 1.3%.

Conclusions:

We found that 80.8% of patients did not return to the ED for re-evaluation. Sending patients with COVID-19 home if they experience mild symptoms is a safe approach for most patients and would likely mitigate some of the financial and staffing pressures on healthcare systems.

Introduction

On December 31, 2019, the first case of the 2019 novel coronavirus disease (COVID-19) was reported in Wuhan, China. The virus responsible for this infection was identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that is likely of zoonotic origin. SARS-CoV-2 is transmitted mainly through respiratory droplets, but may also spread via the fecal-oral route and through aerosolization. As of April 10, 2020, more than 1,696,580 cases have been confirmed worldwide across 213 countries, with greater than 105,950 deaths. In the United States, more than 532,330 cases have been confirmed with more than 21,400 deaths. Currently, Michigan is a new hotspot of COVID infections.
with more than 23,990 confirmed cases and more than 1,390 deaths thus far, with 4 people dying each hour from COVID-19.\textsuperscript{8}

Testing for COVID-19 has become increasingly available across the United States, resulting in greater disease detection. The vast majority of patients who test positive will demonstrate a non-lethal course of illness. In order to conserve hospital resources for patients with severe forms of COVID-19, stable patients are sent home, with instructions to self-isolate and monitor their symptoms. The largest cohort of greater than 44,000 confirmed COVID-19 patients in China showed that 81\% displayed “mild” illness severity, defined as non pneumonia or mild pneumonia,\textsuperscript{9} but these patients were immediately isolated within designated wards in existing hospitals and received hospital care during their illness. No deaths were reported among mild or severe cases while the case-fatality rate was 49\% among “critical” cases (respiratory failure, septic shock, and/or multiple organ dysfunction or failure).\textsuperscript{9} Based on current data, only 19\% of patients with known COVID-19 in the United States are hospitalized with 6\% admitted to the intensive care unit.\textsuperscript{10}

The data on the variability of symptoms and outcomes for patients who are found to have COVID-19 and sent home to self-isolate is limited. We describe the demographics, initial clinical presentation and outcomes of a large cohort of patients with COVID-19 at high risk for severe disease but whose symptoms did not require admission to the hospital.

**Design And Methods**

This multicenter observational retrospective cohort study aims at describing the epidemiologic, clinical characteristics and prognostic factors for more severe disease of patients presenting with symptoms suggestive of COVID-19 and diagnosed with the novel coronavirus infection, who were subsequently sent home to self-isolate without being admitted to the hospital. The study was conducted at Beaumont Health, the largest healthcare system in Michigan, which includes 8 hospitals in Southeast Michigan, providing care for approximately one third of patients in the Detroit Metropolitan area. Patients were included in the study if they tested positive for SARS-CoV-2 at any date up to April 1, 2020, after evaluation at any of the EDs across the eight hospitals, and subsequently discharged home. All patients with a negative test for SARS-CoV-2 were excluded from the study. Prior to data collection, the study was determined exempt per the Beaumont Institutional Review Board.

Per the WHO guidance, laboratory confirmation for COVID-19 was defined as a positive result of real-time reverse transcriptase–polymerase chain reaction (RT-PCR) assay of nasopharyngeal swabs.\textsuperscript{11} Based on Michigan Department of Health requirements over the study period, testing was offered if patients experienced moderate cough or fever over 100.4°F, and if they had chronic kidney disease, heart disease, diabetes, chronic lung disease, are receiving immunosuppression medication, or are immunocompromised due to cancer treatment, recent surgeries or other conditions, suggesting high risk for severe disease.\textsuperscript{12}
The majority of the data was abstracted through automated reports generated through ToadDataPoint multi-platform database query tool from Beaumont’s electronic medical record (EPIC System, Verona, WI, USA). A manual retrospective chart review was performed to confirm that the patients were sent home after being tested and to collect the clinical symptomatology upon initial presentation. Outcome data was reported as follows: when patients had multiple follow up ED visits, admitted inpatient outcome was considered as any ED visit for the patient that resulted in admission. Time to the ED visit was reported based on visits, not per patient. Manual collection of the admission outcomes was performed for patients transferred to another institution or to hospice to ensure the completeness of the reported data. Statistical analysis of the data was performed by the biostatistics department at Beaumont Health. Continuous variables were reported as means and standard deviations (SD) or medians and interquartile ranges (IQR) depending on normality. Categorical variables were reported as frequencies and percentages. $t$-tests were utilized to compare differences among continuous variables. Chi-squared ($\chi^2$) tests were used to compare categorical variables, and $p$-values <0.05 demonstrated statistical significance.

Results

**Demographic data & comorbidities** (table 1): From the first day when testing for SARS-CoV-2 became available within our health system until April 1, 2020, 821 patients were evaluated in the ED, tested positive for SARS-CoV-2 and discharged home to self-isolate without a hospital admission. The mean age was 49.3 (SD 15.7), 46.8% were male, and 55.1% were African-American. Mean BMI was 32.4 (SD 7.7) and 73.4% were non-smokers.

The most commonly reported comorbidity in this cohort was diabetes mellitus (34%), followed by hypertension (31.8%), obstructive sleep apnea (20.8%) and chronic kidney disease (10.5%).

**Clinical characteristics data** (table 2): Cough was the most frequent symptom, reported in 78.2% of patients. Other symptoms frequently reported were fever 62.1%, rhinorrhea or nasal congestion 35.1%, dyspnea 31.2%, myalgias 29.1%, fatigue 22.8% and chills 22.2%. The median duration of cough to ED presentation was 3 days (IQR 2-7). Headache was the most common neurological symptom reported in 12.2% of patients. Diarrhea was found in 8.9% of patients. Presenting vital signs showed a median heart rate of 93 bpm (IQR 51-155) and median temperature 99.2$^\circ$ F (IQR 96.8- 103.7).

**Home medications** (table 3): Nonsteroidal anti-inflammatory drugs (NSAIDs) use were reported in 35.8% of patients and angiotensin-converting enzyme inhibitors (ACEI) or angiotensin II receptor blockers (ARBs) in 28.7%. About a third of patients (33.1%) were taking a vitamin D supplement, and 5.5% were on anticoagulation.

**Outcome data**: The outcome data was collected through April 12, 2020. Out of 821 COVID-19 positive patients who were discharged home at the time of the coronavirus test, 158 patients (19.2%) returned for at least one subsequent visit to ED. Twenty one patients (13.3%) returned twice to the ED for reevaluation, and one patient returned 4 times to the ED but was never admitted to the hospital. The
median time to the initial follow up ED visit was 5 days (IQR 3-7). From the patients that had a follow up ED visit, 86/158 (54.4%) resulted in admissions to the hospital, with an overall admission rate for the entire cohort of 10.5%. Of the patients admitted, 11 (12.8%) died with an overall mortality of 1.3%, and the median time to death was 7 days (IQR 3-13) from the admission date. (Table 4) At the time of outcome collection, 10 patients were still admitted to the hospital, including 6 patients in the intensive care unit (ICU). Assuming the worst-case scenario, if none of the ICU patients survive, the inpatient mortality of this cohort could be as high as 2.1%. The mortality rate would be 2.6% if none of the patients currently in the hospital survive. From our cohort, most COVID-19 patients (80.8%) never returned to the ED for follow-up.

The patients eventually admitted to the hospital were older (mean age 54.4 vs 48.7, p=.002), had higher BMI (35.4 vs 31.9, p=.004), were more likely male (58.1% vs 46.8%, p=.026), and were more likely to have hypertension (52.3% vs 29.4%, p<0.001), diabetes mellitus (74.4% vs 29.3%, p<0.001) or prediabetes (25.6% vs 8.4%, p<0.001), COPD (39.5% vs 5.4%, p<0.001), and OSA (36% vs 19%, p<0.001), dementia (34.9% vs 16.7%, p<0.001), chronic kidney disease (CKD) (17.4% vs 9.7%, p=0.026) or cancer (16.3% vs 8.3%, p=0.015).

Discussion

In this large cohort of patients with COVID-19 and underlying comorbid conditions who were sent home to self-isolate, the majority were younger females of African American descent with an average body mass index within the obesity class I range and never smokers. The patients eventually admitted to the hospital were older, had higher BMI (obesity class II) and were more likely male. The literature on the demographics of patients with COVID-19 at high risk for severe disease who are sent home to self-isolate is limited. According to the Michigan Department of Health and Human Services, overall cases aged 30-59 constitute 59% of the affected population with 53% females and 33% are African-Americans. Currently, African Americans make up 14% of the population in Michigan and in our analysis they have been disproportionately affected by COVID-19.13

Our study also found that the most common symptoms reported upon ED presentation were: fever, dyspnea, rhinorrhea, cough, myalgia, fatigue and chills. These results are consistent with WHO findings of fever, fatigue, and dry cough as the most common COVID-19 symptoms, along with previously reported less common symptoms including myalgias, nasal congestion, rhinorrhea, sore throat, and diarrhea.14 Among 138 hospitalized patients with COVID-19 pneumonia in Wuhan, the most common clinical features at the onset of illness were also fever (99%), fatigue (70%), dry cough (59%), anorexia (40%), myalgias (35%), dyspnea (31%), and sputum production (27%).15 It appears that the inpatient and outpatient commonly reported symptoms are similar.

Diabetes mellitus was the most common comorbidity in our cohort, followed by hypertension, hyperlipidemia and obstructive sleep apnea. Although a requirement for testing included comorbid conditions, more than a third of the patients from our cohort did not have evidence of these medical problems in our database. This finding could have been because the cohort was truly healthier than the
previously reported inpatient cohort and did not fully meet MDHHS criteria and/or their medical records were incomplete with missing data about risk factors for severe disease. Comparing the patients who were eventually admitted to the hospital with the patients who never required an admission, hypertension, diabetes mellitus, prediabetes, OSA, COPD, hyperlipidemia, cognitive impairment or dementia, CKD and cancer were associated with more severe disease requiring hospital admission. Worse outcomes have been reported before in patients with COPD, diabetes mellitus, hypertension, and malignancy.\textsuperscript{16}

Furthermore, a cumulative increased risk of severe disease has been reported with an increase in the number of medical comorbidities. There are other comorbidities that are more unique to our patient population, and their impact on disease progression is less understood. The CDC states that patients suffering from severe obesity (BMI $\geq 40$ kg/m$^2$) and chronic kidney disease (CKD) who are undergoing dialysis, are at increased risk for severe illness. In 2018, an estimated 32.5\% of Michigan adults were classified as obese (BMI $\geq 30$kg/m$^2$), with an additional 35\% classified as overweight (BMI 25 to <30).\textsuperscript{17} Likewise, more than one million Michigan adults (or 1 in 7) suffer from chronic kidney disease.\textsuperscript{18} Future studies should investigate associations between disease progression and comorbidities like obesity and CKD, which are more specific to the American population.

Many patients were taking NSAIDs, ACEIs or ARBs. The effects of NSAIDs on clinical outcomes in COVID-19 infections remain unclear, and the World Health Organization (WHO) have retracted their prior recommendation to avoid NSAID use. The Food and Drugs Administration (FDA) reports the absence “of current scientific evidence connecting use of NSAIDs to worsening COVID-19 symptoms”.\textsuperscript{19,20} The American College of Cardiology/American Heart Association (ACC/AHA) guidelines currently state that there are no experimental or clinical data demonstrating beneficial or adverse outcomes with background use of ACEI, ARBs or other renin-angiotensin aldosterone system (RAAS) antagonists in COVID-19 or among COVID-19 patients with a history of cardiovascular disease treated with such agents. Continuation of RAAS antagonists for those patients who are currently prescribed such agents for indications for which these agents are known to be beneficial, such as heart failure, hypertension, or ischemic heart disease is recommended.\textsuperscript{21}

The current worldwide COVID-19 mortality is 6.9\%, with large variations within different countries with US mortality being 3.8\%, Spain 10.2\%, Italy 12.8\% and China 4.0\%.\textsuperscript{22,23} Our cohort had a low mortality rate likely because a third of the patients had a mild clinical presentation and no overt comorbidities. Among 44,672 confirmed cases of COVID-19 in China, the fatality rate for patients without reported comorbidities was 0.9\%, while the fatality rate for patients with cardiovascular disease, diabetes mellitus, and chronic respiratory disease were 10.5\%, 7.3\%, and 6.3\%, respectively.\textsuperscript{24}

\textbf{Limitations \\ \\ \\ Strengths:}

This study is limited by the retrospective nature of its design. Most of the data was limited to the electronic medical record documentation and adjudication of outcomes via individual chart review was not performed. Outcomes were reported only if the events occurred in our health system. Strengths of this study include a large sample size and thorough manual data collection confirming the disposition of the
patients at the time of the COVID-19 assessment and their clinical symptoms upon presentation to ED. Follow up time was sufficient to capture 92.4% of the outcomes. The patient population in this cohort is very diverse and representative of all the racial minorities.

**Conclusion**

This is the first large retrospective multicenter cohort to report on clinical characteristics and outcomes of COVID-19 patients that were discharged home to self-isolate after initial ED visit. Only 19.2% of patients returned to ED for re-evaluation from which 54.4% got admitted. Overall mortality rate was 1.3%. A better understanding of disease progression among COVID-19 patients as they self-isolate will prove useful in minimizing the burden of disease.

**Declarations**

**Ethics approval and consent to participate:**

The Beaumont Institutional Review Board under the exempt category approved the current study. The consent to participate was waived.

**Consent for publication:**

Not applicable

**Availability of data and materials:**

The datasets used and / or analyzed during the current study are available from the corresponding author on reasonable request.

**Competing interest:**

The authors declare that they have no competing interests.

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**Author Contributions:** A.H. was involved with the development and implementation of the study design and methods, prepared the manuscript draft and multiple revisions based on author's feedback. S.Q.
assisted with data collection. All authors were involved with manuscript preparation, multiple draft revisions, conception of tables and have reviewed and approved the manuscript for submission.

A.H., F.O., Z.I. and Julie George had full access to all the data in the study and take full responsibility for the integrity of the data and the accuracy of the data analysis.

References

1. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. Int J Antimicrob Agents. 2020. doi:10.1016/j.ijantimicag.2020.105924

2. Ji W, Wang W, Zhao X, Zai J, Li X. Cross-species transmission of the newly identified coronavirus 2019-nCoV. J Med Virol. 2020. doi:10.1002/jmv.25682

3. Rothen HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Autoimmun. 2020. doi:10.1016/j.jaut.2020.102433

4. del Rio C, Malani PN. COVID-19—New Insights on a Rapidly Changing Epidemic. JAMA. 2020. doi:10.1001/jama.2020.3072

5. Hindson J. COVID-19: faecal–oral transmission? Nat Rev Gastroenterol Hepatol. 2020. doi:10.1038/s41575-020-0295-7

6. Practice BB. Coronavirus disease 2019. World Health Organ. 2020;2019(April):2633. doi:10.1001/jama.2020.2633

7. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. Lancet Infect Dis; published online Feb 19, 2020. https://doi.org/10.1016/S1473-3099(20)30120-1.

8. Michigan Data: Coronavirus. Department of Michigan Health and Human Services; published online April 2020. https://www.michigan.gov/coronavirus/0,9753,7-406-98163-520743--,00.html

9. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China. JAMA. 2020. doi:10.1001/jama.2020.2648

10. Management of Patients with Confirmed 2019-nCoV. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html; published online April 6, 2020.

11. Laboratory testing strategy recommendations for COVID-19. World Health Organ; published online March 21, 2020. https://apps.who.int/iris/bitstream/handle/10665/331509/WHO-COVID-19-lab_testing-2020.1-eng.pdf

12. Frequently Asked Questions About Coronavirus Disease 2019. Department of Michigan Health and Human Services; published online March 2020. https://www.michigan.gov/documents/mdhhs/2019-nCoV_Web_FAQ_Final_02.07.20_680693_7.pdf

13. Michigan Data. Department of Michigan Health and Human Services; published online April 2020. https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173--,00.html
14. WHO. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected: interim guidance, 25 January 2020. Published January 25, 2020. Accessed March 30, 2020. https://apps.who.int/iris/handle/10665/330854

15. Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. JAMA - J Am Med Assoc. 2020. doi:10.1001/jama.2020.1585

16. Guan W, Liang W, Zhao Y, et al. Comorbidity and its impact on 1590 patients with Covid-19 in China: A Nationwide Analysis. Eur Respir J. March 2020:2000547. doi:10.1183/13993003.00547-2020

17. Obesity in Michigan 2018 Update Prepared by the Michigan Department of Health and Human Services (MDHHS) Cardiovascular Health, Nutrition and Physical Activity Section Key Facts Obesity among Michigan Adults (2007-2016) Data Source: Michigan Behavioral Risk Factor Surveillance System (MiBRFSS) 2007-2016. http://www.michigan.gov/preventobesity. Accessed April 15, 2020

18. FOR IMMEDIATE RELEASE Chronic Kidney Disease Now Affects One Million Michigan Adults. www.nkfm.org. Accessed April 15, 2020. https://www.nkfm.org/sites/default/files/documents/pages/r_-_kidney_month_2020_-_web.pdf

19. Russell CD, Millar JE, Baillie JK. Clinical evidence does not support corticosteroid treatment for 2019-nCoV lung injury. Lancet. 2020;395(10223):473-475. doi:10.1016/S0140-6736(20)30317-2

20. FDA advises patients on use of non-steroidal anti-inflammatory drugs (NSAIDs) for COVID-19 | FDA. https://www.fda.gov/drugs/drug-safety-and-availability/fda-advises-patients-use-non-steroidal-anti-inflammatory-drugs-nsaids-covid-19. Accessed April 15, 2020.

21. American College of Cardiology. HFSA/ACC/AHA statement addresses concerns re: using RAAS antagonists in COVID-19. ACC News Story. 2020 Mar 17

22. Grasselli G, Zanrillo A, Zanella A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA. 2020. doi:10.1001/jama.2020.5394

23. Novel Coronavirus Pneumonia Emergency Response Epidemiology T. [The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China]. Zhonghua Liu Xing Bing Xue Za Zhi. 2020;41(2):145-151.

24. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. The Lancet. 2020. https://doi.org/10.1016/S0140-6736(20)30566-3

Tables

Table 1: Demographic Characteristics and Comorbidities of Patients With COVID-19; Comparison in between Outpatient Patients that Remained Home in Self-Isolation vs Admitted Patients to the Hospital
| Population | All patients No(%); N = 821 | Outpatient patients No(%); N = 735 | Admitted patients No(%); N = 86 | p-value |
|------------|-----------------------------|-----------------------------------|-------------------------------|---------|
| Age±SD, y  | 49.3±15.7                   | 48.7±15.7                         | 54.4±15.6                     | .002    |
| Ex, No (%)  | 384 (46.8%)                 | 334 (45.4%)                       | 50 (58.1%)                    | .026    |
| Sex        |                             |                                   |                               |         |
| Male       | 303 (36.9%)                 | 269 (36.6%)                       | 34 (39.5%)                    | .679    |
| Female     | 452 (55.1%)                 | 405 (55.1%)                       | 47 (54.6%)                    |         |
| Race       |                             |                                   |                               |         |
| Asian      | 66 (8.0%)                   | 61 (8.3%)                         | 5 (5.8%)                      |         |
| Asian      | 32.4±7.7                    | 31.9±7.7                         | 35.4±7.2                      | .004    |
| Hispanic   |                             |                                   |                               |         |
| Non-Hispanic | 41 (5.4%)                 | 34 (39.5%)                       | 3 (8.1%)                      | .000    |
| Hispanic   | 171 (20.8%)                 | 140 (19.0%)                       | 31 (36.0%)                    |         |
| Hypertension | 8 (1.0%)                 | 8 (1.1%)                         | 0 (0.0%)                      | 1.000   |
| Dyslipidemia | 6 (0.7%)                 | 4 (0.5%)                         | 2 (2.3%)                      | .123    |
| Diabetes   | 279 (34.0%)                 | 215 (29.3%)                       | 64 (74.4%)                    | <.001   |
| Gestational diabetes | 8 (10.2%) | 62 (8.4%) | 22 (25.6%) | <.001 |
| Diabetes   | 261 (31.8%)                 | 216 (29.4%)                       | 45 (52.3%)                    | <.001   |
| Gestational diabetes | 168 (20.5%) | 139 (18.9%) | 29 (33.7%) | .001   |
| Renal and thyroid disorders | 116 | 101 (13.7%) | 15 (17.4%) | .351   |
| Condition                      | Outpatient Patients | Admitted Patients | p value  |
|-------------------------------|---------------------|-------------------|----------|
| Fatigue                       | 125 (15.2%)         | 101 (13.7%)       | .001     |
| Failure                       | 18 (2.2%)           | 16 (2.2%)         | 1.000    |
|                               | 86 (10.5%)          | 71 (9.7%)         | .026     |
| **Organic Pathologies**       |                     |                   |          |
| Renal failure or atrophy      | 153 (18.6%)         | 123 (16.7%)       | <.001    |
| Neuronal disorder             | 150 (18.3%)         | 123 (16.7%)       | .001     |
| Ischemic                      | 48 (5.8%)           | 40 (5.4%)         | .149     |
| Ovarian                      | 71 (8.6%)           | 61 (8.3%)         | .299     |
| **Liver Disease**             |                     |                   |          |
| Carcinoma                    | 11 (1.3%)           | 11 (1.5%)         | .617     |
| Hepatitis B                   | 1 (0.1%)            | 1 (0.1%)          | 1.000    |
| Hepatitis C                   | 1 (0.1%)            | 1 (0.1%)          | 1.000    |
| Atologic                      | 146 (17.8%)         | 122 (16.6%)       | .010     |
| Intestinal bowel atresia      | 7 (0.9%)            | 7 (1.0%)          | 1.000    |
| Intestinal Disorder           | 103 (12.5%)         | 94 (12.8%)        | .538     |
| Sepsis                        | 75 (9.1%)           | 61 (8.3%)         | .015     |
| Sepsis suppression            | 11 (1.3%)           | 10 (1.4%)         | 1.000    |
| **of the above**              | 295 (35.9%)         | 292 (39.7%)       | <.001    |

Abbreviations: SD, standard deviation; No., number; y, year; CKD, chronic kidney disease; COPD: chronic obstructive pulmonary disease; OSA: Obstructive Sleep Apnea; HTN, hypertension; HLD, hyperlipidemia; VTE, venous thromboembolic disease; NA: Not applicable; p value applies for comparison in between Outpatient patients and Admitted patients

Table 2: Clinical Presentation
| Initial Presenting Symptoms | No. (%) | Initial Presenting Symptoms (continued) | No. (%) |
|----------------------------|---------|----------------------------------------|---------|
| Constitutional symptoms    |         | Lower Respiratory symptoms             |         |
| Fever                      | 510 (62.1%) | Cough                                  | 645 (78.2%) |
| Chills                     | 182 (22.2%) | Duration of cough, median (IQR), d     | 3.0 (2-7) |
| Fatigue                    | 187 (22.8%) | Sputum Production                      | 26 (3.2%) |
| Anoxia                     | 37 (4.5%)  | Hemoptysis                             | 33 (4.0%) |
| Malaise                    | 41 (5.0%)  | Dyspnea                                | 256 (31.2%) |
| Diaphoresis                | 24 (2.9%)  | Chest pain                             | 81 (9.9%) |
| Musculoskeletal symptoms   |         | Paroxysmal nocturnal dyspnea           | 1 (0.1%)  |
| Myalgias                   | 239 (29.1%) | Neurological symptoms                  |         |
| Arthralgia                 | 11 (1.3%)  | Headache                               | 100 (12.2%) |
| Lower extremity swelling   | 4 (0.5%)   | Confusion                              | 8 (1.0%)  |
| Gastrointestinal           |         | Dizziness                              | 14 (1.7%)  |
| Abdominal pain             | 28 (3.4%)  | Lightheadedness                        | 47 (5.7%)  |
| Nausea                     | 71 (8.6%)  | Syncope                                | 18 (2.2%)  |
| Vomiting                   | 34 (4.1%)  | Presenting Vital Signs                 |         |
| Diarrhea                   | 73 (8.9%)  | Blood pressure                         |         |
| Miscellaneous symptoms     |         | Dysguesia, hypogeusia or aguesia       | 11 (1.3%)  |
| Hyposmia, dysosmia or anosmia | 85 (10.4%) | Systolic (n=787)                       | 132.0 (86-230) |
| Rash                       | 2 (0.2%)   | Diastolic (n=787)                      | 74.0 (41-184) |
| Upper respiratory tract symptoms |         | Respiratory rate, breaths/min (n=785) | 18.0 (13-48) |
| Sore throat                | 103 (12.5%) | Temperature, °C (n=816)                | 99.2 (96.8-103.7) |
Rhinorrhea or nasal congestion 288 (35.1%)  Oxygen saturation, % (n=816) 97.0 (72 - 100)

Abbreviations: bpm, beats per minute; No., number; d, days; IQR: interquartile range

Table 3: Home Prescription Medications

| Medication                  | No. (%)  |
|-----------------------------|----------|
| **Study Population N = 821**|          |
| NSAIDs                      | 294 (35.8%) |
| Anticoagulants              | 45 (5.5%) |
| Antiplatelet agents         | 162 (19.7%) |
| Antihypertensives           |          |
| ACE-I                       | 138 (16.8%) |
| ARBs                        | 98 (11.9%) |
| Glucocorticoids             | 163 (19.9%) |
| Lipid lowering therapy      | 187 (22.8%) |
| Antiviral therapy           | 33 (4.0%) |
| Vitamin D supplements       | 272 (33.1%) |

Abbreviations: SD, standard deviation; No., number; y, year; NSAIDs: Non-steroidal anti-inflammatory medication; Anticoagulants include warfarin and direct oral anticoagulants; antiplatelet agents include aspirin, clopidogrel, prasugrel, and ticagrelor; Lipid lowering therapy: include statin therapy and ezetimibe; antiviral therapy include acyclovir/valacyclovir only; ACE-I: angiotensin converting enzyme-inhibitor; ARB: angiotensin receptor blocker

Table 4: Outcomes

| Outcomes                                             | No. (%)  |
|------------------------------------------------------|----------|
| **Outcomes (No=821)**                                |          |
| Follow up ED visit                                   | 158 (19.2%) |
| Time to ED visit, median(IQR), d (No=182)            | 5.0 (3-7) |
| Length of Stay (LOS), median(IQR), d (No=76)         | 4.0 (3-7) |
| Admitted inpatient after follow-up ED visit          | 86 (54.4%) |
| Mortality                                            | 11 (1.3%) |
| Time to death from admission, median(IQR), d         | 7 (3-13)  |
Abbreviations: No., number; ED: Emergency Department; IQR: interquartile range d: days