Presentation and Demographics of Veterans Tested for COVID-19 Infection

Braden Sciarra, MD[1]; Patrick Kennedy, DO[2]; Katherine Sherman, MS[3]; Nicole M. Held, DO[1]; Nathan Gundacker, MD[2,3]

[1]MCW Department of Internal Medicine, [2]MCW Department of Infectious Diseases, [3]Zablocki VA Medical Center
Medical College of Wisconsin, Milwaukee, WI

Introduction

COVID-19, the infection caused by the Severe Acute Respiratory Syndrome-related Coronavirus 2 (SARS-CoV-2), has been a major cause of morbidity and mortality in the United States since its emergence from Wuhan, China in late 2019. As of October 3, 2020 there have been 130,798 confirmed cases of COVID-19 and 1,372 deaths related to COVID-19 in Wisconsin. Milwaukee County was the epicenter of the early stages of COVID-19 disease in Wisconsin, and the majority of COVID-19 related deaths have occurred within Milwaukee County. It has been well documented that COVID-19 infections are disproportionately affecting minority communities across the United States. Presenting symptom and outcomes vary, with elderly patients and people with underlying health conditions appear to have a higher risk of morbidity and mortality due to the disease.

Methods

- This study was a retrospective chart review of all patients tested for COVID-19 infection from March 1 2020-May 30, 2020 at the Zablocki VA Medical Center in Milwaukee, WI.
- All patients tested for COVID-19 during this time period were included in data collection and analysis.
- Data collection includes samples obtained in the inpatient and outpatient setting.
- We constructed a comprehensive database of patient demographics, comorbidities, presenting symptoms, duration of symptoms, and clinical outcomes for all patients test for COVID-19 during the early stages of the COVID-19 pandemic.
- The primary outcomes analyzed included evaluation for differences in demographic data, comorbidities, presenting symptoms, and vital signs between patients testing *positive* or *not positive* for the SARS-CoV-2 virus.

Results

A total of 173 patients tested for COVID-19 were included during the study period, 82 positive and 91 otherwise. Univariate analysis of patient demographics and presenting symptoms are summarized in the tables below:

Table 1. Demographics and symptoms associated with testing positive for COVID-19

Variable	COVID-19 Positive N = 82; N(%)	COVID-19 Not Positive N = 91; N(%)	p-value
Sex			
Male	76 (92.68)	80 (87.92)	0.1193
Female	6 (7.32)	11 (12.09)	
Race			
White	29 (35.37)	57 (62.64)	
African American	49 (59.76)	23 (25.27)	<.0001
Other	4 (4.88)	11 (12.09)	
BMI			
Normal	14 (7.69)	27 (31.03)	
Overweight	31 (17.03)	28 (32.18)	0.1058
Obese	37 (20.33)	32 (36.78)	
Tobacco			
Yes	14 (17.01)	23 (25.27)	
No	23 (28.05)	31 (34.07)	0.0324
Former	45 (54.88)	33 (36.26)	
Unknown	0	4 (4.40)	
Chief Complaint			
Cough	43 (52.44)	69 (75.82)	0.0007
Shortness of Breath	40 (48.78)	51 (56.04)	0.0771
Fever	27 (32.93)	29 (31.87)	0.1277
Diarrhea	9 (10.98)	1 (1.10)	0.0053
Fatigue/Myalgias	12 (14.63)	26 (28.57)	0.0128
Symptoms			
Cough	63 (76.83)	78 (85.71)	0.0511
Shortness of Breath	48 (58.54)	58 (63.74)	0.0973
Rhinorrhea	18 (21.95)	32 (35.16)	0.0217
Sore Throat	8 (9.76)	24 (26.37)	0.0290
Diarrhea	29 (35.37)	10 (10.99)	<.0001
Nausea	14 (17.07)	8 (8.79)	0.0491
Vomiting	2 (2.44)	8 (8.79)	0.0556
Fatigue	33 (40.24)	21 (23.08)	0.0069
Myalgia/Arthralgia	28 (34.15)	34 (37.36)	0.1147
Loss of Appetite	16 (19.51)	5 (5.49)	0.0035
Change in Taste	6 (7.32)	0 (0)	0.0103

Table 2. Analysis of vital signs associated with testing positive for COVID-19

Vital Sign	COVID-19 Positive (n = 82) Mean ± STD	COVID-19 Not Positive (n = 92) Mean ± STD	p-value
Temperature	99.39 ± 1.43	98.36 ± 0.86	<.0001
Respiratory Rate	21.88 ± 7.63	18.99 ± 3.07	0.3070
Pulse	91.10 ± 16.56	86.13 ± 16.19	0.0479
Systolic BP	139.23 ± 22.76	142.98 ± 22.75	0.3070
Diastolic BP	78.08 ± 13.30	80.98 ± 12.59	0.1660
Oxygen Saturation	93.44 ± 6.33	96.69 ± 2.89	<.0001

Discussion

- A multivariable logistic regression using stepwise selection (AUC=0.7188) showed that patients testing positive for COVID-19, when controlling for demographics and comorbidities, were *more likely to be African-American than White* (OR 3.455, CI 1.733-6.887), and *more likely to have a diagnosis of diabetes* (OR 2.698, CI 1.36-5.353).
- The racial disparities in COVID-19 positivity rate raises concern regarding patient access to COVID testing at the early stages of the pandemic. The disproportionate number of African American veterans testing positive for COVID-19 may indicate provider bias in testing by providers or may be indicative that COVID-19 predominantly infected predominantly African American communities.
- Race and diabetes were not informative when symptoms were included in a subsequent model (AUC=0.8458); patients testing positive for COVID-19 were more likely to present with diarrhea (OR 6.926, CI 1.760- 6.926) and a higher temperature (OR 2.651, CI 1.533-4.584), but less likely to present with vomiting (OR 0.007, CI <.001-0.161) when compared to patients testing otherwise for COVID-19.
- Patients tested for COVID-19 most commonly presented with cough and/or shortness of breath; however, secondary symptoms of diarrhea, fatigue, and loss of taste were predictive of COVID-19 positive testing. The absence of an asymptomatic control group introduces challenges in interpreting the presenting symptoms of patients tested for COVID-19 in the early stages of the pandemic.

Conclusions

Veterans testing positive for COVID-19 in Milwaukee County are more likely to be African-American, and/or diabetic. This further highlights the racial disparities of COVID-19 that has been noted in cities throughout the United States. Patients symptomology at presentation is more related to a positive COVID-19 test results than patient demographics and comorbidities.

Resources:
- Esakandari H, Nabi-Afjadi M, Fakkari-Afjadi J, Farahmandian N, Miresmaeili SM, Bahreini E. A comprehensive review of COVID-19 characteristics. Biol Proced Online. 2020 Aug 4;22:19.
- Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, Transmission, Diagnosis, and Treatment of Coronavirus Disease 2019 (COVID-19): A Review. JAMA. 2020 Aug 25;324(8):782-793.