

Initial Experience with Hospitalized COVID-19 Patients in a Large Health System in Western Pennsylvania



Thejus Jayakrishnan MD, Adeel Nasrullah MD, Patrick Wedgeworth MD, Melissa Mosley MD, Aaron Haag DO, Kirtivardhan Vashistha MD, Max Jacobs DO, Fadi Khouri BS, Shane Mealy MD, Veli Bakalov MD, Abhishek Chaturvedi MD, Susan Manzi MD, Anastasios Kapetanos MD

Department of Internal Medicine; , Allegheny Health Network, Pittsburgh, PA

Introduction

- Coronavirus disease-19 (COVID-19) emerged in Wuhan, China during late 2019 and rapidly transformed into a global pandemic.
- We report our initial experience during the first two months of the pandemic as one of the largest integrated academic health systems in the region.

Methods

- We performed a retrospective cohort study of all patients admitted to the health system of Allegheny Health Network from March 1 through April 30, 2020 following Institutional Review Board approval.
- Primary outcomes included inpatient mortality and length of stay (LOS). Secondary outcomes included inpatient complications [intensive care unit (ICU) requirement, intubation, organ system failure], and discharge disposition.
- Categorical variables are resulted in percentages and continuous variables in median with interquartile range (IQR).
- Multivariate regression analysis was performed.

Results

- 7766 patients were tested for COVID-19 during the study period, with 444 positive results (5.7% test positivity rate). 98 patients were hospitalized in our institution
- Patient characteristics are outlined in Table 1 and the significant predictors of mortality are outlined in Table 2.
- 58 patients (59.2%) required ICU, 34.7% required intubation. Inpatient complications included ARDS (29 patients, 29.6%), shock (25, 25.5%), RRT (6, 6.1%) and cardiac arrest (3, 3.1%).

Table 1. Characteristics for Patients Hospitalized with COVID-19

Characteristics	Value
Age (in years)	62 (53.3-72.8)
Male	64 (65.3%)
Race	
Non-Hispanic White	67 (68.4%)
Non-Hispanic Black	21 (21.4%)
Hispanic	3 (3.1%)
Other/Unknown	7 (7.1%)
Suspected Mode of Transmission	
Family	18 (18.3%)
Patient (as HCP)	9 (9.2%)
Other/Unknown	71 (72.4%)
Travel History	
No Known Travel	83 (84.7%)
Interstate Travel	14 (14.3%)
International Travel	1 (1.0%)
Smoking	
Current Smoker	6 (6.1%)
Comorbidities	
Hypertension	64 (65.3%)
Obesity (BMI>30kg/m ²)	49 (50.0%)
Diabetes	38 (38.8%)
Arrhythmias	16 (16.3%)
Thyroid disorder	15 (15.3%)
Chronic kidney disease	14 (14.3%)
Asthma	14 (14.3%)
Coronary artery disease	13 (13.3%)
Congestive heart failure	13 (13.3%)
Depression	12 (12.2%)
Valvular Disease	10 (10.2%)
Non-Metastatic Cancer	9 (9.2%)
COPD	8 (8.2%)
Symptoms	
Cough	74 (75.5%)
Dyspnea	72 (73.5%)
Fever	69 (70.4%)
Fatigue	60 (61.2%)
Myalgia/Arthralgia	46 (46.9%)
Chills	34 (34.7%)
Anorexia	23 (23.5%)
Diarrhea	22 (22.4%)
Nausea/Vomiting	21 (21.4%)
Sore Throat	15 (15.3%)
Chest Pain	14 (14.3%)
Muscle Weakness	13 (13.3%)

Results

- Overall mortality was 20.4% (20 patients) and median length of stay (LOS) was 6 days (IQR 3.0-13.8).
- 50 patients, (51.0%) were discharged home while 22 patients (22.4%) were discharged to an outside facility including 5 patients (5.1%) to hospice.
- Of those discharged alive, 32.1% had a new oxygen requirement.

Table 2. Significant Factors Associated with Mortality

	Odds ratio	P-value
Age	1.04 (1.00-1.08)	0.03
Admission tachypnea	16.7 (2.1-131.1)	0.007
Hypoxia at admission	4.1 (1.2-13.2)	0.02
Lymphopenia at admission	3.9 (1.3-11.4)	0.014
Steroid use *	7.0 (2.4-20.7)	0.004
Plasmapheresis*	14.6 (1.4-149.7)	0.02
Proning*	8.4 (2.0-35.4)	0.03
APACHE at transfer to ICU	1.1 (1.02-1.24)	0.012
Shock	17.3 (5.2-57.7)	0.000
ARDS	11.9 (3.7-38.3)	0.000
Acute cardiac injury	15.2 (4.7-49.7)	0.000
Acute kidney injury	4.7 (1.6-13.3)	0.004

*Likely confounded by the severity of the disease

Conclusions

- The study highlights the high prevalence of comorbidities such as hypertension and obesity in these patients and a high probability of oxygen requirement at discharge.
- Most patients presented without a history of travel, indicating community transmission as early as the beginning of March.
- While inpatient mortality was comparable to other US studies (20.4% vs 16-25%), ICU level care was higher (59.2% vs 14-39%).
- Several factors associated with adverse outcomes were identified but will be updated with our larger subsequent data.

References

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3. Gold JAW. Characteristics and Clinical Outcomes of Adult Patients Hospitalized with COVID-19 — Georgia. *MMWR Morb Mortal Wkly Rep*. March 2020