Clinical Characteristics and Outcomes in Patients with Pneumonia secondary to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

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Background

- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first recognized as the etiology of an acute respiratory illness in Wuhan, China in December 2019, and has since spread across the globe resulting in a unique global public health emergency[1].
- Patients with multiple co-morbidities are generally considered higher risk for development of more severe disease with a worse prognosis.
- It remains unclear which risk factors result in a higher predilection for patients to develop more severe disease presentations requiring admission to intensive care units (ICUs), mechanical ventilation, or increased mortality after diagnosis with SARS-CoV-2.
- Previous studies documented clinical presentation and risk factors of patients diagnosed with SARS-CoV-2 pneumonia, including one study showing patients were more likely to require mechanical ventilation if they were male, obese, or had elevated inflammatory markers[1-4].
- The purpose of this study was to compare patient demographics and clinical characteristics in those diagnosed with pneumonia secondary to SARS-CoV-2 to identify characteristics associated with more severe disease and increased mortality in hospitalized patients.

Methods

- This was a single-center, retrospective, IRB-approved study at The Ohio State University Wexner Medical Center including patients diagnosed with SARS-Cov-2 from March 1, 2020 to April 20, 2020.

Inclusion Criteria	Exclusion Criteria
• Ages 18-89 years old • Positive nasopharyngeal swab for SARS-CoV-2 • Inpatient admission	• Prisoners • Pregnant Women

- 92 total patients.
- Baseline demographics, clinical characteristics, and patient outcomes were collected, and then compared between those patients who required admission to the general medicine floor and those admitted to the ICU.
- Statistical analysis: univariate and multivariate logistic regression analysis to evaluate the relationship between clinical characteristics and mortality.

Primary Outcome	To compare the association of patient demographics and clinical characteristics on patient outcomes following diagnosis with pneumonia secondary to SARS-CoV-2

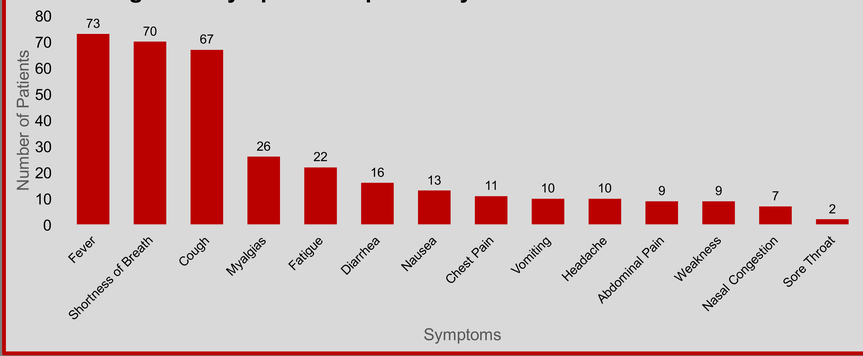
Results

Table 1: Patient Baseline Demographics (N = 92)*

Age, mean (minimum, maximum)	58 years (25 – 93)
Age Greater than 60 years	37 (40%)
Gender:	
Male	47 (51%)
Female	45 (49%)
Race:	
African American	40 (43%)
White	39 (42%)
Asian	6 (7%)
More than 1 Race	1 (1%)
Other	6 (7%)
Body Mass Index (BMI):	
Less than 18.5	2 (2%)
18.5-24.9	17 (18%)
25-29.9	16 (17%)
Greater than 30	57 (62%)
Charlson Comorbidity Index	3.12 (0 – 9)
Co-Morbidities:	
Coronary Artery Disease	15 (16%)
Asthma	17 (18%)
Chronic Obstructive Pulmonary Disease	11 (12%)
Cancer**	17 (18%)
History of Transplant***	8 (9%)
Chronic Kidney Disease	11 (12%)
Hemodialysis	2 (2%)
Diabetes Mellitus	31 (34%)
Rheumatoid Arthritis	1 (1%)
Systemic Lupus Erythematosus	2 (2%)
Obstructive Sleep Apnea	12 (13%)
Tobacco Use	23 (25%)
Admission from an Extended Care Facility	10 (11%)
Initial Admission Location:	
General Medicine Floor	80 (87%)
Intensive Care Unit (ICU)	12 (13%)
Required ICU During Admission	34 (37%)
Outcomes:	
Discharged from Hospital	80 (87%)
Deceased	12 (13%)

*Values presented as N (%) unless otherwise defined.
**Malignancy includes leukemia 1 (1%), lymphoma 2 (2%), Metastatic disease 3 (3%), and other 11 (12%)
***History of transplant includes renal transplant 4 (4%), bone marrow transplant 2 (2%), heart transplant 1 (1%), and renal/pancreas transplant with repeat renal transplant 1 (1%).

Figure 1: Symptoms Reported By Patients with SARS-CoV-2



Results

Table 2: Clinical Characteristics Association with Mortality in Patients with COVID-19

Clinical Characteristic	Odds Ratio	Confidence Interval	p-value
Male Gender	1.40	0.41 – 4.78	0.590
African American	0.61	0.17 – 2.19	0.450
Age Greater Than 60	3.86	0.97 – 15.3	0.055
Coronary Artery Disease	**7.88**	**2.09 – 29.7**	**0.002**
Living in Extended Care Facility	**6.17**	**1.43 – 26.6**	**0.015**
Tobacco Use	0.56	0.11 – 2.77	0.480
Diabetes Mellitus	3.27	0.94 – 11.3	0.060
Obesity (Body Mass Index >30)	2.00	0.50 – 7.95	0.320
Asthma	0.87	0.17 – 4.37	0.860
Chronic Obstructive Pulmonary Disease	**5.21**	**1.24 – 21.77**	**0.020**
Immunocompromised Patient*	**4.20**	**1.20 – 14.7**	**0.025**

*Immunocompromised patients include those with history of or active malignancy, history of transplant, or on immunosuppressive therapy for systemic lupus erythematosus or rheumatoid arthritis.

Table 3: Multivariate Analysis of Clinical Characteristics Associated With Mortality in COVID-19

Clinical Characteristic	Odds Ratio	Confidence Interval	p-value
Coronary Artery Disease	**13.1**	**2.77 – 61.8**	**0.001**
Living in Extended Care Facility	**12.1**	**2.13 – 68.3**	**0.005**

Conclusions

- Multivariate analysis showed a statistically significant higher mortality for patients diagnosed with pneumonia secondary to SARS-CoV-2 who had underlying coronary artery disease and those admitted from an extended care facility.
- Further studies are necessary to identify potential preventative strategies to mitigate mortality in this vulnerable population.

References

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