Assessment of Different Etiologies of Patients Mechanically Ventilated with COVID-19 from 7/1/2022 to 6/31/2023

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Published In/Presented At

Vaughan, E., Weaver, D., & Miller, K. (2023, July 28). *Assessment of Different Etiologies of Patients Mechanically Ventilated with COVID-19 from 7/1/2022 to 6/31/2023* . Poster presented at Research Scholars, Lehigh Valley Health Network, Center Valley, PA.

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Introduction

- COVID-19 is a respiratory disease that may require the utilization of mechanical ventilation
- Mechanical ventilation is a life support device that is utilized to help the patient breathe and it provides oxygen to them
- The **objective of this data review** was to determine if patients diagnosed with COVID-19 are mechanically ventilated for COVID-19 pneumonia or for some other etiology
- The **vaccination status** and **mortality rate** was also assessed for those patients who were intubated for COVID-19 pneumonia
- The COVID-19 results were stratified by variant type and time frame:

Alpha - 3/1/2020 to 10/31/2020
Delta - 11/1/2020 to 8/31/2021
Omicron BA.1 - 9/1/2021 to 1/31/2022
Omicron BA.2 - 2/1/2022 to 6/30/2022
Omicron BA.2.12.1 – 7/1/2022 to 9/31-2022
Omicron BQ.1/BQ.1.1 – 10/1/2022 to 1/31/2023
Omicron XBB.1.5 – 2/1/2023 to 6/31/2023

Methods

DATA COLLECTION

- Patient data was collected via the five Lehigh Valley Health Network (LVHN) locations for patients that were ventilated with COVID-19 using EPIC data
- The data was stratified into specific categories based on admission/discharge diagnosis
  - Resp*, Neuro*, Cardiac, Sepsis, Inc.*, Misc*

DATA ANALYSIS

- Those patients admitted for respiratory sequala were further analyzed for specific etiologies during their hospitalization
- COVID-19 variants patient outcomes were analyzed from both previous and current data collection

Results

Resp. (%,n)	Neuro. (%,n)	Cardiac (%,n)	Sepsis (%,n)	Inc. (%,n)	Misc. (%,n)	Pts. Survival	Pts. Exp.	Pts. Vax.	Pts. Unvax.
39.3 (33)	19.0 (16)	13.1 (11)	9.5 (8)	8.3 (7)	10.7 (9)	51.0 (42)	49.4 (41)	62.7 (52)	37.3 (31)

Table 1. Patients' Principal Diagnosis upon Admission and Clinical Characteristics 7/1/2022 to 6/31/2023

COVID Pneumonia (%,n)	Pneumonia Viral/Bacteria (%,n)	ARDS (%,n)	COPD/Asthma (%,n)	Aspiration (%,n)	Upper Airway Obstruction (%,n)
33.3 (11)	9.1 (3)	3.0 (1)	24.2 (8)	24.2 (8)	6.1 (2)

Table 2. Respiratory Patient Breakdown of Specific Conditions 7/1/2022 to 6/31/2023

COVID-19 Variant	Patients Survived (%,n)	Patients Expired (%,n)	Survived Vaccinated (%,n)	Expired Unvaccinated (%,n)
Alpha	48.7 (94)	51.3 (99)	N/A **	N/A **
Delta	33.1 (136)	**66.9 (275)**	42.5 (58)	92.8 (255)
Omicron BA.1	23.7 (76)	**76.3 (245)**	30.4 (23)	83.1 (204)
Omicron BA.2	60.0 (30)	40.0 (20)	32.1 (10)	66.7 (13)

Table 3. COVID-19 Variant Breakdown 3/1/2020 to 6/30/2022 of 975 Patients

COVID-19 Variant	Patients Survived (%,n)	Patients Expired (%,n)	Survived Vaccinated (%,n)	Expired Unvaccinated (%,n)
Omicron BA.2.12.1	N/A	N/A **	N/A **	N/A **
Omicron BQ.1/BQ.1.1	25.0 (2)	75.0 (6)	89.0 (2)	100.0 (6)
Omicron XBB.1.5	33.0 (1)	67.0 (2)	33.0 (1)	50.0 (1)

Table 4. COVID-19 Pneumonia Variant Breakdown from 7/1/2022 to 6/31/2023 of 11 Patients

Conclusions

- Patients Intubated for Respiratory Disease from 7/1/2022 to 6/31/2023
  - Of the 84 patients with COVID-19, **39.7% (33 patients)** were intubated due to respiratory disease
  - Of the 33 patients with respiratory disease, **33.3% (11 patients)** were intubated due to COVID-19 pneumonia
  - The incidence of mechanical ventilation during the most recent variants is much lower than the historical variants
- Vaccination Status & Mortality Rate
  - Unvaccinated patients mechanically ventilated for COVID-19 pneumonia had a higher degree of mortality compared to patients vaccinated
- COVID-19 Variant Mutation
  - Delta and Omicron BA.1 had the worst mortality rate of all the variants
  - Omicron BQ.1/BQ.1.1 continued to show a high mortality rate due to its low sample size (n=11)

Future Directions

- Educate the community on the importance of getting vaccinated to reduce the incidence of mortality associated with COVID-19
- Assess patient demographics and clinical characteristics for COVID-19 pneumonia patients for an increased factor of morbidity and mortality
- Compare LVHN statistics to similar medical centers using Vizient

Clinical Observations

- **Clinical rounds:** NICU/PICU, MICU/SICU, Trauma Neuro ICU, Inpatient Rehabilitation Center. Open Heart Surgery, Emergency Department, PFT Lab, Respiratory Services, MSICU discharge planning meeting

- * = Respiratory, Neurology, Incidental, and Miscellaneous
- ** = Not Applicable (No Data Available)
- ARDS = Acute Respiratory Distress Syndrome
- COPD = Chronic Obstructive Pulmonary Disorder
- Patients Expired, Vaccinated

Scan QR Code to Access "Assessing the Patient Demographics and Clinical Characteristics of Mechanically Ventilated Patients with COVID-19 at Lehigh Valley Health Network (LVHN)" by Danielle Weaver and Kenneth Miller

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