CLABSIs in the Time of COVID

Maria Rosa Velasquez MD[1], Mary Dundas MS[2], Donald Chen MD[1], Marina Keller MD[1]

[1]Department of Internal Medicine, Division of Infectious Diseases, New York Medical College, Westchester Medical Center, New York, NY, USA
[2]Department of Quality, Westchester Medical Center, New York, NY, USA

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BACKGROUND

With the COVID-19 pandemic, acute care facilities experienced an initial increase in hospital-acquired infections, most notably Central Line-Associated Bloodstream Infections (CLABSIs) [1].

Interestingly, the positive correlation between COVID-19 and CLABSIs appeared to wane post-surge.

OBJECTIVES

We sought to define the pre and post-pandemic CLABSI rates in the medical Intensive Care Unit (ICU) and to describe the clinical characteristics of patients that developed CLABSIs during the study period.

METHODS

Single-center, retrospective review of the CLABSIs that our institution reported to the National Healthcare Safety Network (NHSN) for the five years before COVID and through to the First Quarter of 2022 (January 1, 2015, and March 31, 2022).

Only adults admitted to our medical ICU were included in the study.

Cases during Quarters 1 and 2 of 2020 were excluded from the study since there was no NHSN reporting performed at that time.

All analyses (Wilcox, Chi-square, and T-student test depending on the variables) were done with R programming language using R Studio Graphical interface with α = 0.05 and 95% confidence intervals.

RESULTS

A total of 30 cases met the definition of CLABSI during the study period.

- 15 were identified from 2015 to 2019.
- 15 were identified from October 2020 to March 2022.
  - 8 cases between Oct 2020 to March 2021
  - 7 cases between April 2021 to March 2022

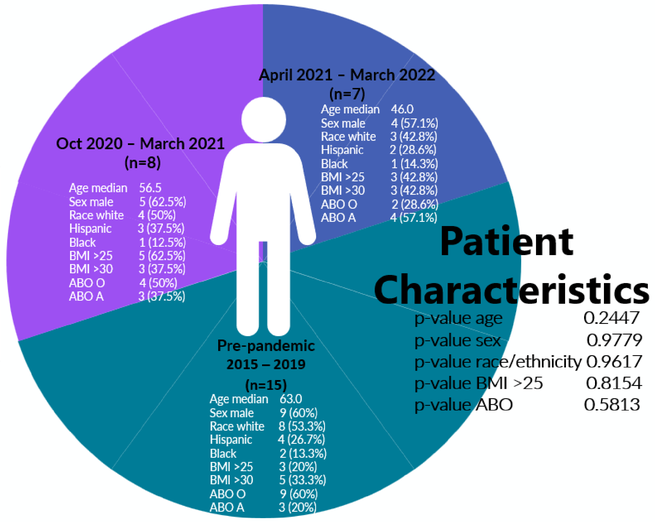

Table 1. Co-morbidities

	2015 – 2019 (n=15)	Oct 2020 - March 2021 (n=8)	April 2021 – March 2022 (n=7)	p-value
Lung disease	5 (33.3%)	3 (37.5%)	2 (28.6%)	0.5158
Diabetes	7 (46.7%)	1 (12.5%)	1 (14.3%)	0.1371
Hypertension	13 (86.7%)	2 (25%)	3 (42.8%)	0.0091
CHF	3 (20%)	0	0	0.1889
Hyperlipidemia	9 (60%)	3 (37.5%)	2 (28.6%)	0.3226
CAD	4 (26.7%)	1 (12.5%)	0	0.2753
Liver disease	6 (40%)	2 (25%)	2 (28.6%)	0.7329
Chronic kidney disease	11 (73.3%)	3 (37.5%)	3 (42.8%)	0.1793
Malignancy	9 (60%)	0	3 (42.8%)	0.0196
Immunosuppression	10 (66.7%)	2 (25%)	4 (57.1%)	0.1578
COVID-19 PCR positive	0	7 (87.5%)	3 (42.8%)	

Table 2. Use of steroids and other immunosuppressant drugs

	2015 – 2019 (n=15)	Oct 2020 - March 2021 (n=8)	April 2021 – March 2022 (n=7)	p-value
Steroid use 30 days prior to CLABSI	11 (77.3%)	8 (100%)	7 (100%)	0.0994
Use an equivalent of at least 30mg/day of prednisone the week prior to CLABSI	7 (46.7%)	6 (75%)	5 (71.4%)	0.3259
Use of immunosuppressive drugs other than steroids	9 (60%)	3 (37.5%)	5 (71.4%)	0.3895

Table 3. Outcomes

	2015 – 2019 (n=15)	Oct 2020 - March 2021 (n=8)	April 2021 – March 2022 (n=7)	p-value
Days from admission to CLABSI				
Mean	31.67	16.38	17	
Median	16	10	14	0.1243
Standardized Infection Ratio (SIR)	1.007 p-value 0.9457 CI 0.585 – 1.623	4.601 p-value 0.0005 CI 2.137 – 8.737	2.026 p-value 0.0869 CI 0.886 – 4.008	
Mortality	10 (66.7%)	7 (87.5%)	5 (71.4%)	0.5557

DISCUSSION

No significant demographic or co-morbidity differences were found among the groups, likely reflecting the regular census of our institution (pre and post covid pandemic) that brings care to a critically ill population, including solid organ and bone marrow transplants, acute leukemias, and patients requiring extracorporeal membrane oxygenation.

After 2019, patients with CLABSI tended to be younger and had a higher Body Mass Index, but this was not statistically significant, possibly due to low study power. The same could be hypothesized regarding the increased use of steroids and the higher mortality rate in patients who developed CLABSI during the pandemic.

CONCLUSIONS

We reported a spike in CLABSIs in our adult medical ICU during the second wave of COVID-19 that affected the Northeast United States in the winter of 2020/2021. Despite experiencing a sharp rise, our CLABSI rates are returning to pre-pandemic low levels even during subsequent surges in COVID-19, including the recent Omicron surge.

It remains to be determined if the improvements in infection control measures, differences in the patient illness severity, and/or variations of COVID management have contributed to the stabilization of the CLABSI rate.

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BIBLIOGRAPHY

1. Patel PR, Weiner-Lastinger LM, Dudeck MA, et al. Impact of COVID-19 pandemic on central-line-associated bloodstream infections during the early months of 2020, National Healthcare Safety Network. Infect Control Hosp Epidemiol. 2021;1-4. doi:10.1017/ice.2021.108