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## Letter to the Editor

### Nosocomial methicillin-resistant *Staphylococcus aureus* bacteremia in incarcerated patients with severe COVID-19 infection



As Coronavirus disease 2019 (COVID-19) infections swiftly entered the correctional healthcare system, routine infectious disease management changed dramatically. Personal Protective Equipment (PPE) became universal in order to decrease viral spread among a crowded and vulnerable population.<sup>1,2</sup> We theorized that the increase in PPE use would decrease nosocomial infections overall. However, within 3 months, 3 inmates from the same local state prison admitted as inpatients to our county hospital for COVID-19 infections, developed nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia. During this period, one other patient from a skilled nursing facility also developed nosocomial MRSA bacteremia but was COVID-19 negative. For comparison, prior to the COVID-19 pandemic, the hospital has had no more than 5 nosocomial MRSA bacteremia infections identified in the last 4 years. The 3 patients with COVID-19 infection and nosocomial MRSA bacteremia are detailed below:

Patient 1 was a 60-year-old male admitted in April 2020 for several days of fever, cough, and dyspnea. The patient had a history of chronic obstructive pulmonary disease, hypothyroidism, and coronary artery disease. He tested positive for COVID-19 and was initially admitted to the medical floor. Nasopharyngeal MRSA testing was negative on admission. The patient received systemic steroids. On hospital day 3, the patient developed worsening respiratory distress, was intubated, and had a central venous catheter placed for hypotension. The patient died this day; blood cultures drawn grew MRSA.

Patient 2 was an 83-year-old male admitted in late May 2020 with hypoxia and known COVID-19 infection. His medical history included atrial fibrillation and hypertension. Nasopharyngeal MRSA testing was negative on admission. The patient was treated with Remdesivir and systemic steroids. On hospital day 13, the patient required intubation and developed hypotension. On hospital day 14, a central venous catheter was placed; blood and throat cultures obtained were both MRSA positive. The patient died the same day from septic shock.

Patient 3 was a 60-year-old male admitted in June 2020 with severe hypoxia and COVID-19 infection. His medical history included type II diabetes, hypertension, and hepatitis C cirrhosis. Nasopharyngeal MRSA testing was negative on admission. Initially, he was admitted to the intensive care unit but improved and was transferred to

the medical floor. He was treated with systemic steroids but was not a candidate for Remdesivir. On hospital day 4, he had a cardiopulmonary arrest and was transferred back to the intensive care unit. On hospital day 9, blood cultures were positive for MRSA. On hospital day 10, the patient died from pneumonia after the family signed a Do-Not-Resuscitate order.

## DISCUSSION

MRSA nasopharyngeal swabs and blood cultures are routinely performed at our hospital, with results reported to the Center for Disease Control and Prevention. We differentiate community versus nosocomial MRSA bacteremia following National Healthcare Safety Network definitions, based on date of admission to the unit and culture date. When the first COVID-19 cases were identified, multiple measures were initiated to avoid COVID-19 transmission in the hospital, including having a dedicated COVID-19 unit, extensive PPE use throughout the hospital, and a hand-washing initiative. Hand sanitizer use increased in the hospital to almost double the amount compared to the same time period 1 year ago.

With the extensive protective measures in place, we were surprised by the multiple cases of nosocomial MRSA bacteremia within a short period. Was this merely a result of systemic steroid treatment? Or could there be a biological relationship between COVID-19 and MRSA? Was there something significant about the COVID-19 RNA makeup that might make a patient more susceptible to nosocomial infection? In the setting of MRSA bacteremia and COVID-19 infection, should viral genetic testing be considered and implemented?

We write this letter to the editor to highlight a series of patients that could lead to further research into the relationship between the COVID-19 virus and other infections. As information about the COVID-19 virus continues to grow, this may help to identify correlations and interactions with the virus and guide hospital policies to decrease associated nosocomial infections.

## References

1. Akiyama MJ, Spaulding AC, Rich JD. Flattening the curve for incarcerated populations—Covid-19 in jails and prisons. *N Engl J Med*. 2020;382:2075–2077.
2. Hawks L, Woolhandler S, McCormick D. COVID-19 in prisons and jails in the United States. *JAMA Intern Med*. 2020;180:1041–1042.

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