What If We Don't? A Retrospective Review of Standard Precautions for MRSA

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ABSTRACT

Background: There are conflicting data in the literature about the need for contact isolation for active methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

Methods: In this retrospective review, we compared the MRSA bloodstream standardized infection ratio for 1 year while contact precautions were in place for MRSA infections and for 1 year after routine contact precautions for MRSA were no longer in place.

Results: There was no change in the MRSA bloodstream standardized infection ratio between the two time periods.

Conclusions: With cessation of contact precautions for MRSA infections, there was no change in bloodstream MRSA standardized infection ratios across a large health system. While standardized infection ratios would not detect asymptomatic horizontal transmission of a pathogen, it is reassuring that bloodstream infections – a known complication of MRSA colonization status – did not rise with cessation of contact precautions.

BACKGROUND

Treating and preventing antimicrobial-resistant organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA) continues to pose a challenge for health care workers worldwide.[1,2] Historically, patients with MRSA infections have been placed in contact isolation although, due to a shortage in the supply of personal protective equipment (PPE), some institutions have reduced isolation protocols in the past few years.[2] While some reports suggest contact precautions for MRSA can help prevent nosocomial transmission,[1,2] other data suggest that cessation of isolation does not lead to higher rates of nosocomial infections.[3,4]

Catholic Health Initiatives, Midwest Division (CHI-MD), is a health system composed of 10 acute-care hospitals and 18 critical-access hospitals in Nebraska, Iowa, North Dakota, and Minnesota. In March 2020, CHI-MD stopped routine contact isolation for active MRSA infections in anticipation of a PPE shortage due to the SARS-CoV-2 pandemic. We later evaluated our standardized infection ratio (SIR) for MRSA bacteremia, comparing a 1-year time period in 2019 from prior to cessation of routine isolation to a 1-year time period in 2021-2022 after the change in isolation had been implemented for some time and the acute increase in hospitalizations due to the SARS-CoV-2 pandemic had diminished. In this retrospective analysis, we assessed the impact of discontinuation of routine contact precautions for active MRSA infections on the MRSA SIR.

METHODS

This was a retrospective evaluation using data from CHI-MD hospital facilities comparing 4 quarters of data from 2019 to 4 quarters of data from 2021-2022. Data were obtained by the infection prevention department from information reported to the National Healthcare Safety Network for hospital-associated MRSA blood stream infections. The baseline time period was the 4 quarters of calendar year 2019, prior to the change in isolation policy and prior to local issues of the SARS-CoV-2 pandemic. The time period of March 2021 to April 2022 was chosen as the postintervention evaluation period. This time period was chosen for a period of 1 year after the change in policy to make sure that it was well-established and to remove the significant impact that

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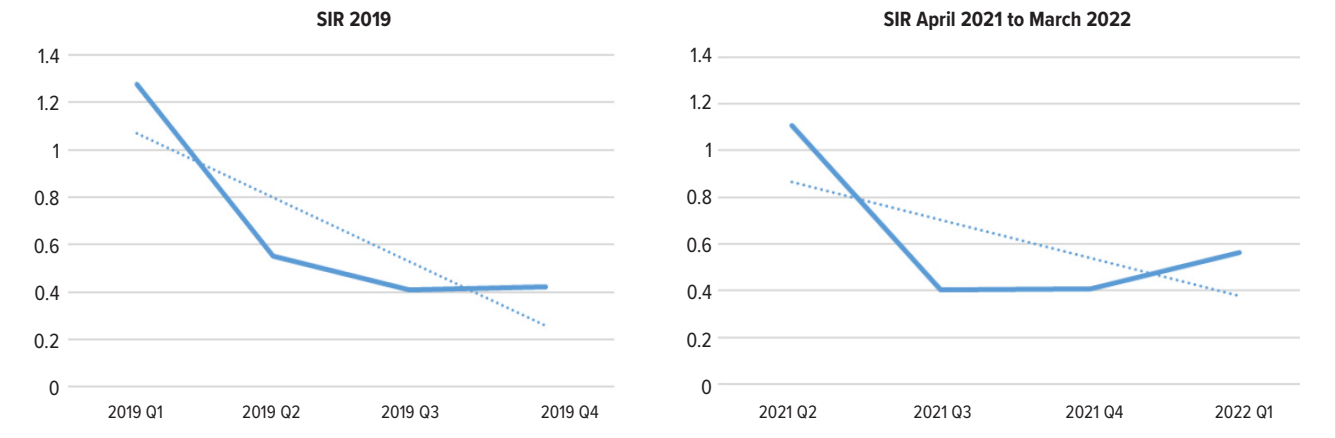
Figure. Methicillin-resistant *Staphylococcus aureus* (MRSA) Bloodstream Infection Standardized Infection Ratio (SIR) for Each Quarter



the increase in hospitalizations due to the SARS-CoV-2 pandemic may have on hospital-acquired infections.[5] The MRSA bloodstream SIR from the two time periods were compared to evaluate for any change that might be associated with the change in the isolation policy.

RESULTS

The MRSA SIR for the study time periods are outlined in the Table and Figure. Overall, the MRSA bloodstream infection SIR for the 2019 (baseline) time period was 0.698 (95% CI, 0.406-1.202). The overall MRSA bloodstream infection SIR for the 2021-2022 time period was 0.615 (95% CI, 0.357-1.060). Although there was a slight absolute reduction in SIR in the post-intervention time period (11.9%), this did not reach statistical significance (SIR difference as ratio 0.881, 95% CI, 0.409-1.900)

Table. Methicillin-Resistant *Staphylococcus Aureus* (MRSA) Bloodstream Infection Standardized Infection Ratio (SIR) for Each Quarter

Timeframe	SIR	SIR *P* value	SIR 95% CI
2019 Q1	1.278	0.5253	0.518 – 2.658
2019 Q2	0.553	0.3031	0.141 – 1.504
2019 Q3	0.408	0.1765	0.068 – 1.347
2019 Q4	0.424	0.2025	0.071 – 1.402
2021 Q2	1.107	0.7586	0.449 – 2.303
2021 Q3	0.405	0.1727	0.068 – 1.339
2021 Q4	0.407	0.1761	0.068 – 1.346
2022 Q1	0.565	0.3249	0.144 – 1.537

DISCUSSION

Contact isolation is not a benign intervention. It has been estimated that 71 pounds of waste is generated weekly by a patient on contact precautions for MRSA.[6] In addition to financial and environmental costs,[3] there can be decreased patient satisfaction scores,[7] reduced interaction between patients and health care providers,[8] and even increased patient adverse events.[9,10] Similar to other recent studies,[3] our data suggest that there was no increase in MRSA bacteremia SIR with discontinuation of contact isolation for this pathogen.

There are limitations to our evaluation. Our health system does not routinely screen for MRSA carriage on hospital admission; in-house MRSA acquisition may not be noticed unless an active infection develops during the hospital stay, leading to its inclusion in the overall MRSA bloodstream infection SIR. The presumptive goal of contact precautions is not to prevent bloodstream infections; it is to prevent the in-house horizontal transmission of potential pathogens. However, if there were a marked increase in MRSA colonization acquisition among patients due to cessation of contact precautions, this might be reflected in MRSA bloodstream SIRs since pathogens involved with bacteremia are typically part of the host flora. To truly determine whether contact precautions are effective in decreasing horizontal transmission of MRSA, it would be necessary to universally screen all patients on both admission and discharge during time periods when contact precautions are in place and when they are not. In addition, this data analysis does not include data on the facilities' compliance with contact isolation protocols; it is assumed that practice follows the established policies. Finally, analysis of data for other potential complications of in-house acquisition of MRSA (such as MRSA pneumonia or soft tissue infections) also could be examined to see if these rates change with the presence or absence of contact precautions.

One strength of our evaluation is the size of the health system involved. CHI-MD includes 10 acute care facilities, including a large tertiary level I trauma center, that contribute to this SIR data, as well as 18 critical access facilities. Collection of data from multiple facilities in several geographic regions increases the overall generalizability of the results.

CONCLUSIONS

Our results suggest that discontinuation of routine contact isolation for MRSA infection did not lead to an increase in nosocomial bloodstream MRSA infections. While a cost analysis was not performed for savings due to decreased PPE use, other analyses have shown that discontinuation of isolation is associated with significant cost savings.[3,4] While there may be some benefit for the use of contact isolation for active MRSA infections (eg, facilities with poor hand hygiene rates or a high baseline MRSA SIR), our results suggest that on a system-wide level, discontinuation of contact isolation for active MRSA infections does not lead to an increase in MRSA SIR.

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