2173. Suspending Use of Contact Precautions in Patients Colonized with Methicillin-Resistant *Staphylococcus aureus* in a Level III Neonatal ICU and Its Effects on Rates of Transmission

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Session: 242. HAI: MRSA, MSSA, and Other Gram-positives
Saturday, October 7, 2017: 12:30 PM

Background. There is limited evidence to support whether contact precautions (CP) for MRSA-colonized patients in a Neonatal ICU (NICU) reduces rates of transmission, given current endemic MRSA. This study assesses rates of hospital-associated MRSA (HA-MRSA) in the NICU before and after discontinuation of CP for patients colonized with MRSA.

Methods. Active screening for MRSA colonization occurs on admission and weekly for all NICU patients. Clinical infections were identified on routine cultures. Decolonization with Mupirocin and Chlorhexidine bathing was done for all MRSA-positive patients. Rates of HA-MRSA pre, during, and post CP suspension were assessed. MRSA isolates from before and after the contact precautions suspension period were saved and sent for pulse-field gel electrophoresis (PFGE). PFGE results from previous clusters of HA-MRSA isolates were also reviewed. Furthermore, 11 highly-ranked level III NICUs were surveyed to compare infection prevention practices for MRSA isolation. Overt hand hygiene auditing, family education, and enhanced environmental cleaning were in place during the entire study timeframe.

Results. Rate of HA-MRSA during 6 month pretrial, 2 month suspension period, and 3 month post-trial was 0.94, 2.24, and 1.05 per 1000 patient-days respectively. During previous outbreaks 14 isolates were sent for PFGE testing resulting in 2 isolates matching. Six isolates from the CP suspension period resulted in 2 matching pairs. Three isolates from post-trial were different from each other and from previous isolates. Survey results revealed 100% of facilities use CP for MRSA-positive patients. Three of 11 NICUs have a decolonization protocol in place, while 10 actively screen for MRSA.

Conclusion. Preliminary results demonstrated an increase in HA-MRSA after suspending CP for MRSA-colonized patients. According to the survey results, the standard of care appears to be the use of CP for all MRSA-positive patients, although decolonization practices varied. Given the limited size of our study, more data is needed to determine whether CP is necessary to prevent transmission of HA-MRSA in the presence of an active screening and decolonization program, a robust hand hygiene program, and enhanced environmental cleaning in the NICU setting.

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2174. Risk of Methicillin-Resistant *Staphylococcus Aureus* (MRSA) Infection during a Hospitalization among MRSA Carriers and Non-Carriers in the Absence of Contact Isolation

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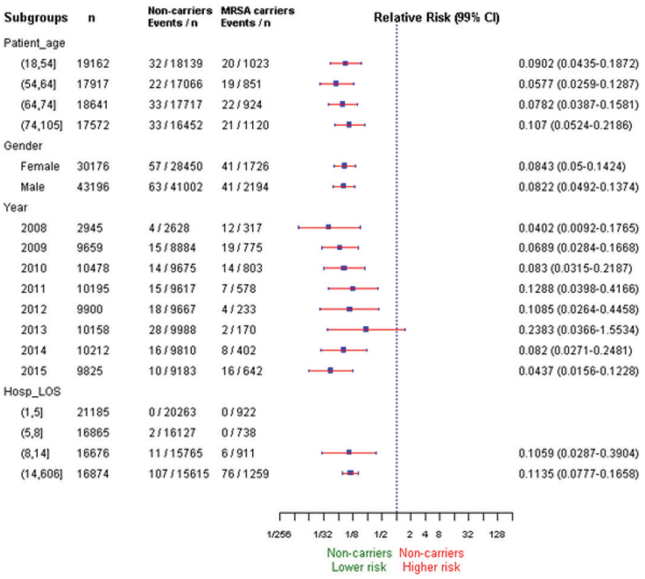
Background. Contact isolation of methicillin-resistant *Staphylococcus aureus*(MRSA) carriers is designed to "protect" non-carriers from MRSA infection. The Cleveland Clinic does not place MRSA carriers in contact isolation. The purpose of this study was to examine the value of contact isolation by comparing the risk of MRSA infection in MRSA carriers and non-carriers, in the absence of contact isolation.

Methods. Adult patients hospitalized at Cleveland Clinic from Jan 1, 2008 to December 31, 2015, who were tested for *S. aureus*colonization by PCR or culture of a nasal swab at least once during the hospitalization were screened for inclusion. Only the first hospitalization per patient was considered. Included patients were divided into MRSA carriers and non-carriers, based on the result of their first nasal MRSA test result. Among these patients, the risk of subsequent MRSA bloodstream infection (BSI) and non-bacteremic MRSA infection during the same hospitalization were determined, and compared, for non-carriers vs. carriers.

Results. Of 74595 patients identified, 1223 were excluded because they had a *S. aureus* infection within 3 days of admission to the hospital. Of the remaining 73372 patients, 5% were MRSA carriers. One hundred and twenty (0.2%) of 69,452 non-carriers developed an MRSA infection during the same hospitalization compared with 82 (2.1%) of the 3,920 MRSA carriers (RR 0.08, 99% CI 0.06–0.12, p-value 3.62×10^{-50}). Relative risks were very similar when analyzed separately for bacteremic and non-bacteremic infection. A Monte Carlo simulation with 1,000 trials simulating corrections for false positive and false negative nasal MRSA tests found very similar results. The magnitude of the effect was similar across subgroups of age, sex, year, and hospital length of stay (figure).

Conclusion. Non-carriers are at much lower risk of developing MRSA infection during a hospitalization than are MRSA carriers. The absolute risk of MRSA infection in non-carriers is one-fifth of 1%, even in the absence of "protection" by contact isolation of MRSA carriers. These findings suggest that the focus of preventing MRSA infections should be on protecting MRSA carriers, not the non-carriers.

Figure: Relative Risk, across subgroups, of MSSA carriers developing MRSA infection compared with MRSA carriers.



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2175. Intra-Facility Acquisition of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Southern Wisconsin Skilled Nursing Facilities

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Background. Studies have shown that skilled nursing facilities (SNFs) are reservoirs for methicillin-resistant *Staphylococcus aureus* (MRSA). The extent to which resident-to-resident transmission accounts for the high burden of MRSA in these facilities remains poorly understood. The objective of this study was to estimate the frequency of intra-facility MRSA acquisition in a sample of SNFs participating in a longitduinal study in Wisconsin.

Methods. MRSA colonization among a cohort of 449 subjects residing in six SNFs in Southern Wisconsin was measured using serial, multi-anatomical surveillance culturing. Phenotypic acquisitions events (i.e., MRSA [-] to MRSA[+]) were identified and further characterized both temporally (calendar date) and genetically (pulse-field gel electrophoresis). An intra-facility acquisition event was defined as incident recovery of an MRSA isolate that was genetically identical to at least one other strain previously recovered in a study facility. A Marascuilo procedure for comparing multiple proportions was employed to determine whether the proportion of intra-facility MRSA acquisitions differed across study facilities. Linear regression was employed to assess if certain facility-level characteristics were associated with rates of intra-facility MRSA acquisition.

Results. 129 acquisition events were identified that met our criteria, of which 74 were determined to be intra-facility (57.4%) [95% CI: 45.5–67.6%]. Statistically significant differences were found between the intra-facility acquisition proportion of multiple SNFs. A facility's baseline MRSA prevalence was significantly associated with its intra-facility MRSA acquisition rate ($R^2 = 0.784$, P-value = 0.012).

Conclusion. Intra-facility acquisition represents a large proportion of the burden of MRSA observed in SNFs. The rate of intra-facility acquisition is variable between facilities but may, in part, be explained by the prevalent burden of MRSA in the facility (i.e., MRSA colonization pressure to characteristics of the facility). Whether other facility characteristics, including infection prevention practices are contributing to these transmission dynamics requires further study.

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2176. A Multidisciplinary Evaluation of *Staphylococcus aureus* Screening, Decolonization and Patient Adherence to Pre-Operative Decolonization Procedures

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