Methicillin-Resistant *Staphylococcus aureus* Burden in Nursing Homes Associated with Environmental Contamination of Common Areas

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I  Background

- Nursing homes (NH) can have high prevalence of MRSA colonization (5-50%), often exceeding hospitals (6-12%) and ICU(10-16%).
- Differences in infection control policies or practices in different NH may explain differences in MRSA burden and variable levels of environmental MRSA contamination.
- Environmental contamination has been linked to MRSA transmission in hospitals and may be influential in NH too.

II Objective of the study: To determine whether environmental cleaning and contamination are associated with variation in the prevalence of MRSA between nursing homes.

III Methods review: Prospective study of environmental contamination and cleaning quality.

- Population chosen: Ten California nursing homes.
- Intervention: None.
  1. Environmental sampling for MRSA by culturing common areas.
  2. Assessing removal of intentionally applied marks visible only under UV light.
  3. Administering surveys on infection control and cleaning.
- Outcome chosen: To determine associations between MRSA contamination, cleaning quality, and infection control practices.
- Statistics: Bivariate and Multivariate Analyses of Environmental MRSA.

IV Results

- Median MRSA admission prevalence was 12% (4-31%), and median MRSA point prevalence was 24% (7-51%).
- 6 of the 10 NH were in the high MRSA delta prevalence group.
- A higher proportion of MRSA-positive objects was found in the high than in low MRSA delta prevalence NH groups (19% vs 10%, *P* = 0.005)
- Marks were removed twice as often on flat as on non-flat objects (35% vs 17%,*P*<0.001).
- Cleaning mark removal was similar in high and low delta prevalence groups (23% vs 21%).
• MRSA positive objects were associated with higher MRSA admission prevalence (P<0.001), lower % of administrator time dedicated to infection control (P =0.006), greater number of rooms assigned per cleaning staff member (P<0.001) and less time spent cleaning per room (P<0.001).
• See table.

V Authors’ conclusions:
• One of the first studies to show that environmental contamination with MRSA may contribute to the burden of MRSA in nursing homes.
• Higher MRSA contamination levels of NH fomites were associated with a larger number of MRSA carriers at point prevalence than at admission prevalence, which may suggest that MRSA contamination contributes to transmission.
• Modifying cleaning practices may reduce MRSA environmental contamination and burden in NH mainly by increasing the time spent cleaning per room and improving cleaning in common areas.

VI Limitations
• Although a substantial difference in MRSA point and admission prevalence may result from transmission, residents were not serially swabbed to determine whether transmission occurred.
• Higher MRSA point prevalence may also result from unmasking of prior colonization.
• Genetic testing of environmental MRSA strains was not performed.
• Threshold of cleaning quality that must be achieved to reduce MRSA contamination could not be determined.

VII Summary for practice implications
Does it apply to our practice? YES
• Implementation of improved cleaning practices in high MRSA burden NH may allow for less-stringent contact precaution polices.