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The Effect of Daily Bathing with Chlorhexidine on the Acquisition of Methicillin-Resistant Staphylococcus aureus, Vancomycin-resistant Enterococci, and Healthcare-associated Bloodstream Infections: Results of a Quasi-experimental Multicenter Trial*

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OBJECTIVE:: Spread of multidrug-resistant organisms within the intensive care unit (ICU) results in substantial morbidity and mortality. Novel strategies are needed to reduce transmission. This study determined if the use of daily chlorhexidine bathing would decrease the incidence of colonization and bloodstream infections (BSI) because of methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant Enterococcus (VRE) among ICU patients.

DESIGN, SETTING, AND PATIENTS:: Six ICUs at four academic centers measured the incidence of MRSA and VRE colonization and BSI during a period of bathing with routine soap for 6 months and then compared them with a 6-month period where all admitted patients received daily bathing with a chlorhexidine solution. Changes in incidence were evaluated by Poisson and segmented regression modeling.

INTERVENTIONS:: Daily bathing with a chlorhexidine containing solution.

MEASUREMENTS AND MAIN RESULTS:: Acquisition of MRSA decreased 32% (5.04 vs. 3.44 cases/1000 patient days, $p = 0.046$) and acquisition of VRE decreased 50% (4.35 vs. 2.19 cases/1000 patient days, $p = 0.008$) following the introduction of daily chlorhexidine bathing. Segmented regression analysis demonstrated significant reductions in VRE bacteremia ($p = 0.02$) following the introduction of chlorhexidine bathing. VRE colonized patients bathed with chlorhexidine had a lower risk of developing VRE bacteremia (relative risk 3.35; 95% confidence interval 1.13-9.87; $p = 0.035$), suggesting that reductions in the level of colonization led to the observed reductions in BSI.

CONCLUSION:: We conclude that daily chlorhexidine bathing among ICU patients may reduce the acquisition of MRSA and VRE. The approach is simple to implement and inexpensive and may be an important adjunctive intervention to barrier precautions to reduce acquisition of VRE and MRSA and the subsequent development of healthcare-associated BSI.

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