The Role of Negative Methicillin-resistant Staphylococcus Aureus Nasal Surveillance Swabs in Predicting Need for Empiric Vancomycin Therapy in Patients at Intensive Care Unit

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Background: The role of methicillin-resistant Staphylococcus aureus (MRSA) nasal surveillance swabs (nasal swab) in guiding decisions about prescribing vancomycin is unclear.

Objectives: We aimed to 1) determine the likelihood that patients with negative MRSA nasal swabs could develop subsequent MRSA infections; 2) assess avoidable vancomycin days for patients with negative nasal swabs; and 3) identify risk factors for having a negative nasal swab and developing a MRSA infection during the intensive care unit (ICU) stay.

Methods: This retrospective cohort study was conducted in six ICUs at a tertiary care hospital from December 2013 - June 2015. The negative predictive value (NPV), defined as the ability of a negative nasal swab to predict no subsequent MRSA infection, was calculated. Days of vancomycin continued or restarted after 3 days from the collection time of the first negative nasal swab were determined. A matched case-control study identified risk factors for having a negative nasal swab and developing MRSA infection.

Results: Of 11,441 MRSA-nasal swab negative patients, the proportion of subsequent MRSA infection was 0.22%. A negative nasal swab had a NPV of 99.4% (95% CI, 99.1-99.6%). Vancomycin was continued or started after nasal swab results were available in 1,431 patients, translating to 7,364 vancomycin days. No risk factors associated with MRSA infection were identified.

Conclusion: Following a low prevalence of MRSA transmission, a negative MRSA nasal swab was helpful in identifying patients with low risk of MRSA infection, whom empiric vancomycin can be stopped and subsequent initiation of vancomycin during the ICU admission should be avoided.

Keywords: MRSA, vancomycin, Antimicrobial stewardship
Figure. Receipt of vancomycin among patients with negative MRSA nasal surveillance swabs.