Predictive Value of the Methicillin-Resistant Staphylococcus Aureus (MRSA) Nasal Swab for MRSA Ventilator Associated Pneumonia (VAP) in the Trauma Patient

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Objectives: Many trauma centers have empiric treatment algorithms for ventilator associated pneumonia (VAP) treatment prior to culture results that include antibiotics for methicillin-resistant staphylococcus aureus (MRSA) coverage that can have potentially harmful side effects. This is the only study to evaluate risk factors and MRSA nasal swabs to risk stratify trauma patients for MRSA VAP thereby limiting the need for empiric vancomycin.

Materials and Methods: This was a single institution retrospective cohort study. Adult patients admitted to the trauma ICU between 1/2013-12/2017 who had a MRSA nasal swab and subsequently met criteria for VAP were included. Demographics, risk factors for MRSA pneumonia, and culture results were collected.

Results: A total of 140 patients met inclusion criteria. Smokers were significantly more likely to develop MRSA pneumonia, odds ratio: 7.0 (P=0.02). The negative predictive value (NPV) of MRSA nasal swab at predicting subsequent MRSA pneumonia was 97%. The sensitivity, specificity and positive predictive value were 50.0%, 96.2%, 44.4%, respectively. When considering non-smokers with a negative MRSA nasal swab, NPV was 100%.

Conclusions: This is the only study to date that assesses the utility of MRSA nasal swab and risk factor data to guide empiric VAP antibiotics in trauma patients. Smoking was found to be a significant risk factor for MRSA pneumonia. The use of MRSA nasal swabs in combination with smoking status to guide empiric use of MRSA coverage antibiotics is recommended due to a 100% NPV. When utilized, as many as 68% of patients may safely be spared MRSA coverage antibiotics and the related side effects.