Nasal and Pharyngeal Carriage of Methicillin-resistant Staphylococcus aureus (MRSA) in Undergraduate Nursing Students

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Methicillin-resistant Staphylococcus aureus (MRSA) accounts for high numbers of opportunistic infections in hospitals. Healthcare workers are believed to serve as transmitters of the pathogen and pose a transmission risk to patients. Nursing students may be at risk for acquiring MRSA carriage through patient contact during clinical rotations. To begin understanding the relationship between clinical exposure and MRSA carriage, noses and throats of UNC Wilmington nursing students were tested for MRSA. Sixty-five undergraduate nursing students at UNCW were asked to participate in this study by filling out consent forms and having background information on possible past exposure to MRSA. Swab samples of the anterior nares and pharynx were obtained and spot-transferred to CHROMagar™ plates to identify S. aureus. Prospective S. aureus isolates were tested for coagulase activity and for the presence of mecA and meca genes by PCR. Antibiotic sensitivity of each isolate was tested by disk diffusion. MRSA was defined as being cefoxitin-resistant and meca-positive. Fifty-one percent of test subjects were S. aureus carriers with 35% testing positive in the nose and 31% testing positive in the throat. Fifteen percent of the subjects were exclusive throat carriers, indicating that the pharynx was an important testing site. Ten S. aureus isolates were D-Test positive, indicating inducible clindamycin resistance. Only one student had nasal carriage of MRSA, which was resistant to cefoxitin but sensitive to erythromycin and clindamycin. This study highlights the importance of testing the throat for S. aureus colonization. Other studies have reinforced the importance of testing for throat carriage especially among young people. Although the reason is still unclear, people under the age of 30, like our participating nursing students, were more likely to carry S. aureus in their throats (3). Even though 40-50% of participants colonized with S. aureus, surprisingly only one student in each trial presented with MRSA, each in the nose. This result was similar to that of a study of S. aureus nasal colonization in Texas nursing students where only one of 87 tested positive for MRSA (4). The low levels of MRSA carriage could be the result of nursing students being so well informed about protecting themselves against MRSA or by colonization among nursing students by other species of Staphylococcus during clinical exposure (3). Therefore, one could speculate that MRSA was not acquired despite repeated exposure because most participants were already colonized with non-resistant S. aureus. These isolates were methicillin-sensitive. Therefore, the study did not cover the higher prevalence of methicillin-resistant S. aureus (MSSA) and the lower occurrence of MRSA in this study.

Our current cohort study will track pre-nursing students from the time they enter the nursing program to the beginning of their clinical experience until their graduation from UNCW with a BSN. Only 29 of 50 (58%) pre-nursing students participated in the fall 2013 collection. We hope that they will continue to return for testing in each of their four semesters. By doing so, we can compare the prevalence of MRSA carriage and the rate of MRSA colonization increases their likelihood of being colonized with MRSA. This study also will allow us to observe whether detection of carriage in either site changes over time. Data from the spring 2014 suggests that this does occur. Thus, further investigations have been made between demographic data or risk factors from the questionnaire and S. aureus carriage.

REFERENCES

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