American Journal of Infection Control 42 (2014) 834-40

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major article

Perceptions of methicillin-resistant *Staphylococcus aureus* and hand hygiene provider training and patient education: Results of a mixed method study of health care providers in Department of Veterans Affairs spinal cord injury and disorder units

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Key Words:
Provider training
Patient education
Methicillin-resistant *Staphylococcus aureus*
Spinal cord injury and disorders

Background: The goal of this study was to assess current practices for training of spinal cord injury and disorder (SCI/D) health care workers and education of veterans with SCI/D in Department of Veterans Affairs (VA) spinal cord injury (SCI) centers on methicillin-resistant *Staphylococcus aureus* (MRSA) prevention.
Methods: Mixed methods. A Web-based survey was distributed to 673 VA SCI/D providers across 24 SCI centers; 21 acute care and 1 long-term care facility participated. There were 295 that responded, 228 had complete data and were included in this analysis. Semistructured interviews were conducted with 30 SCI/D providers across 9 SCI centers.
Results: Nurses, physicians, and therapists represent most respondents (92.1%, n = 210); over half (56.6%, n = 129) were nurses. Of providers, 75.9% (n = 173) reported receiving excellent or good training on how to educate patients about MRSA. However, nurses were more likely to report having excellent or good training for how to educate patients about MRSA ($P = .005$). Despite this, only 63.6% (n = 82) of nurses perceived the education they provide patients on how MRSA is transmitted as excellent or good.
Conclusion: Despite health care workers reporting receiving excellent or good training on MRSA-related topics, this did not translate to excellent or good education for patients, suggesting that health care workers need additional training for educating patients. Population-specific MRSA prevention educational materials may also assist providers in educating patients about MRSA prevention for individuals with SCI/D.

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Conflict of interest: None to report.

This study was supported by the United States Department of Veterans Affairs, Office of Research and Development, Health Services Research and Development Service, and Quality Enhancement Research Initiative (Grant: RRP09-163). The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs.

0196-6553/$00.00 - Published by Elsevier Inc. on behalf of the Association for Professionals in Infection Control and Epidemiology, Inc.
http://dx.doi.org/10.1016/j.ajic.2014.04.026

Methicillin-resistant *Staphylococcus aureus* (MRSA) colonization and health care–associated infections (HAIs) are prevalent in the United States.[1] Effective prevention strategies are necessary in combating the morbidity, mortality, and cost of MRSA HAIs.[2]

In 2007, the Department of Veterans Affairs (VA) launched a national initiative to prevent the spread of MRSA in VA acute care facilities.[1] An extension of this effort occurred in VA's spinal cord injury (SCI) centers starting with collaboration between the VA's MRSA prevention and spinal cord injury and disorder (SCI/D) service program offices. This collaboration resulted in the development of the Guidelines for Implementation of MRSA Prevention Initiative in the Spinal Cord Injury Centers, released in July 2008.[3] The guidelines were designed to aid SCI/D units in the implementation of the MRSA Prevention Initiative but allow for full patient participation in rehabilitation activities. An MRSA bundle based on published evidence was used in guidelines that included the following across hospital units: (1) universal nasal surveillance for MRSA, (2) contact precautions for patients colonized or infected with MRSA, (3) hand hygiene for everyone, (4) a change in institutional culture where infection control became the responsibility of everyone coming into contact with a patient,[1] and (5) finally, MRSA prevention coordinators at each facility tasked with coordinating implementation of the bundle.[4] In the first 45 months of the initiative, the rate of MRSA HAIs in SCI/D units declined 81% from 1.217 to 0.237 HAIs/1,000 patient-days.[5] Patients with SCI/D and health care providers who work with them face different organizational- and patient-level factors than the broader population. Patients with SCI/D are at higher risk for MRSA[6] HAIs due, in large part, to factors, including longer lengths of stay, frequent exposure to bodily fluids, pressure ulcers, other recurrent infections, increased antibiotic use,[7] and an admission prevalence of 38%[5] compared with 15% of the general population.[1] Efforts to control spread of the organism may be further complicated by the frequent use of shared rehabilitation equipment and implications of impaired hand function (common among individuals with tetraplegia)[8] for performing recommended hand hygiene.

Health care providers play a critical role in the communication of quality information and education about MRSA to patients[9]; however, this is only possible if providers have a thorough knowledge of MRSA and the ability to accurately answer patient questions.[10] Evidence suggests that education and training play an important role in provider knowledge, attitude, and behavior related to infection control practices.[2] Studies of providers in various patient care settings have shown that some providers lack knowledge of infection control[11] and may also lack confidence in their ability to answer patient questions related to infection control.[10] These providers may be eager to receive more training about such topics[12] to improve their knowledge and confidence. The purpose of this study was to assess provider perceptions of the training that they received about MRSA and the education that they provided to patients.

METHODS

Setting and design

The VA's SCI/D system of care includes 24 SCI/D centers across the United States, which provide comprehensive, coordinated lifelong care delivered by interdisciplinary teams. This mixed methods study included a cross-sectional, anonymous, Web-based survey fielded to health care providers in 24 VA SCI/D centers (22 acute care, 2 long-term care) located throughout the U.S. In an effort to expand on the survey findings, audio-recorded semistructured interviews were subsequently conducted with SCI/D health care providers at 9 of the 22 SCI/D centers providing acute care. The appropriate institutional review board approvals were secured through the Edward Hines Jr. VA Hospital prior to administering the survey and conducting the interviews.

Survey content and administration

The online survey consisted of 40 questions representing a range of topics, including provider demographics, perceptions of MRSA-related training that they received and the modalities in which the trainings were delivered, and modalities for frequency of and perceptions of MRSA-related education that they provided to patients, visitors, and family members. Survey questions included a combination of yes or no questions and 5-point Likert-type questions (where was 1 was strongly disagree and 5 was strongly agree or where 1 was not at all frequently and 5 was extremely frequently); most questions also included do not know as a response option.

Initial lists of potential survey participants were assembled using relevant VA group email lists and updated provider lists from administrative personnel at each facility. These lists were combined yielding a final list of eligible participants. The survey was administered using Inquisite Web Survey System 7.0 (Catapult Systems Corp, Austin, TX). Respondents were provided a unique electronic link through an e-mail invitation generated by the system, and the survey was available for 3 weeks. There were 2 reminder e-mails sent during this period to those who had not completed the survey.

Semistructured interview content and conduct

Semistructured interviews were conducted via telephone with 3-4 SCI/D staff members from 9 different SCI centers. The process used for identifying these sites began by the research team selecting a set of survey questions intended to gather information about frequency of engaging in practice behaviors that are both expected and critical to MRSA prevention (ie, conducting active surveillance, placing patients who are positive on contact precautions, educating patients and others on MRSA prevention). The percentage of respondents from each facility who reported that they usually or always perform these prevention behaviors was used to create a summary score for their respective facility. The scores were then used to organize facilities into low, medium, and high scores, and a sample of 2-4 facilities was selected from within each of these groups for a total of 9 facilities.

The study team contacted SCI chiefs at each of the 9 participating facilities to explain the purpose of the study and to ask for initial recommendations of staff members who might be appropriate to complete an interview. Our goal was to develop a purposive sample[13,14] where, in the context of this study, included individuals had direct experience with local efforts in MRSA prevention. We requested that leaders recommend staff members for an interview based on the individual's involvement in direct patient care; therefore, clinical practices related to MRSA prevention were represented as fully and accurately in the interview data as possible. We strove to stratify our sample by staff member role and represent the perspectives of at least 1 physician, 1 nurse, and 1 therapist from each facility. We also invited MRSA prevention coordinators at each facility to complete an interview. Recommended individuals were then invited to participate in the study via an informational letter.

A total of 43 providers were invited to participate in an interview via an informational letter; 35 (81.4%) individuals participated in interviews, and 8 (18.6%) did not respond to the request (ie, no one directly refused participation). In an effort to avoid the biases that can result from using a single interviewer, 4 authors (J.N.H.,