Brief report

Relationship between knowledge and attitudes of methicillin-resistant Staphylococcus aureus and hand hygiene behavior in Veterans with spinal cord injury and disorder

Swetha Ramanathan MPH a,*, Jennifer N. Hill MA a, Kenzie A. Cameron PhD, MPH b, c, Nasia Safdar MD d, Marylou Guihan PhD a, Charlesnika T. Evans PhD, MPH a, c

a Department of Veterans Affairs, Center of Innovation for Complex Chronic Healthcare and Spinal Cord Injury Quality Enhancement Research Initiative, Edward Hines Jr. Veterans Affairs Hospital, Hines, IL
b Division of General Internal Medicine and Geriatrics, Department of Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL
c Department of Preventive Medicine and Center for Healthcare Studies, Feinberg School of Medicine, Northwestern University, Chicago, IL
d Department of Medicine and Department of Population Health Sciences, University of Wisconsin Hospitals and Clinics, University of Wisconsin and William S. Middleton Memorial Veterans Hospital, Madison, WI

Key Words:
Methicillin-resistant Staphylococcus aureus
Veterans
Spinal cord injury
Knowledge
Attitudes
Hand hygiene behavior

The objective of this analysis was to understand the relationship between knowledge and attitudes regarding methicillin-resistant Staphylococcus aureus and hand hygiene behavior based on a baseline survey administered to Veterans with spinal cord injuries and disorders. Higher knowledge was associated with higher attitude scores ($r = 0.35, P = 0.003$), but knowledge and attitudes were not associated with behavior. Also, those with quadriplegia had higher knowledge scores ($P = 0.03$). Knowledge and attitudes, although related, do not appear to fully explain patients’ hand hygiene behavior.

Published by Elsevier Inc. on behalf of the Association for Professionals in Infection Control and Epidemiology, Inc.

Methicillin-resistant Staphylococcus aureus (MRSA) causes an estimated 80,461 severe infections each year.1 Persons with spinal cord injuries and disorders (SCI/D) are at high risk for infections such as MRSA because of frequent contact with body fluids, use of catheters, high prevalence of pressure ulcers, and frequent antibiotic use.2

Despite the importance of patient knowledge as necessary for prevention of MRSA, studies have shown that patients have little knowledge about MRSA infection.3-6 This article highlights a portion of data from a pilot randomized controlled trial to implement an educational intervention about MRSA, including improving hand hygiene practice. Therefore, the objective of this analysis was to assess the relationship between an individual’s knowledge of and attitudes toward MRSA infection and hand hygiene practices in Veterans with SCI/D.

METHODS

Study design and recruitment

This analysis reports baseline survey data from a pilot, blinded, block randomized controlled trial to assess the feasibility of an intervention targeting patient education on MRSA in Veterans with SCI/D.3 Participants were eligible and informed consent was obtained if they had a diagnosis of SCI/D, were 18 years of age, were cognitively intact, and were available for a telephone posttest evaluation within 1-2 weeks after administration of the intervention. Further details are published elsewhere.3 Seventy-two Veterans from 2 Veterans Affairs’ spinal cord injury units were assessed for eligibility; 3 declined to participate, leaving a total of 69 participants.

Survey design and analysis

A survey to assess the domains of MRSA and infection control knowledge, attitudes, and hand hygiene behavior was administered to participants at baseline and follow-up.7 The current analysis is based on the baseline survey; a detailed description of the survey content and procedures has been published elsewhere.7 The survey questions were developed based on the existing literature and...
content of the educational materials from the randomized controlled trial intervention. The survey was piloted with a sample of patients with SCI/D to assess patient understanding of the questions and revised accordingly. Examples of items include the following: “MRSA is a bacterium” (knowledge); “MRSA is a serious health care problem” (attitude); and “How often do you wash your hands before doing bowel or bladder care?” (behavior). Knowledge questions received a value of 0 for incorrect or do not know and a value of 1 for correct responses. Questions assessing attitudes were coded 0-4 (strongly disagree = 0, strongly agree = 4). Hand hygiene behavior responses were coded 0-4 (never and do not know = 0, always = 4). All responses to survey questions were summed within each domain, with a maximum knowledge score of 16, attitude score of 48, and behavior score of 32.

We conducted a reliability analysis of the survey items using Cronbach alpha analysis. Removal of questions made no significant difference in the alpha; therefore, all questions were retained for each domain.

Further analysis was conducted to assess if each scored domain was related to the level of SCI injury, prior infections, or ever having MRSA infection because it has been suggested in the literature that those with prior health care–associated infections (HAIs) have better awareness about infections, and SCI/D injury can limit the ability to perform hand hygiene.

We used SAS software version 9.3 (SAS Institute, Cary, NC) to generate descriptive and univariate statistics to describe demographics and knowledge, attitudes, and behavior.

RESULTS

Sixty-nine Veterans with SCI/D were enrolled. Most participants were white (65.2%), men (92.7%), >50 years of age (92.7%), and had some college or a college degree (71.0%) (Table 1). Over a third of the participants reported ever having MRSA.

Cronbach alpha for the knowledge, attitude, and behavior scores were 0.84, 0.84, and 0.88, respectively. The mean knowledge, attitude, and behavior scores were 12.2, 38.4, and 21.5, respectively (Table 1). Correlation analysis revealed that higher knowledge was associated with higher attitude scores (r = 0.35, P = .003); however, knowledge and attitude scores were not significantly correlated with behavior scores (Table 2).

Knowledge scores were higher for those who had ever had MRSA compared with those who had not (14.9 vs 10.4, P = .003). Knowledge scores also were higher for those who had quadriplegia or tetraplegia compared with those with paraplegia (12.9 vs 11.1, P = .03). No other significant relationships were found among the other independent variables and the domains. However, correlation analyses showed a significant positive correlation between knowledge and attitudes (r = 0.33, P = .03) in those who never had MRSA infection and a moderate positive correlation between attitudes and behavior (r = 0.38, P = .05) in those who ever had MRSA (Table 2).

DISCUSSION

Educatings patients is an important yet often unrecognized factor in preventing MRSA infection. Such education is especially relevant in populations with prior history of HAI and complex chronic conditions who are at higher risk of developing MRSA. This study found that those with higher knowledge scores had more positive attitudes regarding the importance of prevention of MRSA and their hand hygiene practices.

We did not find a correlation between knowledge and behavior, unlike other studies, which have advocated increasing patient’s knowledge on MRSA and other HAIs to lower transmission and acquisition of MRSA. One possible explanation for our findings is that hand hygiene behavior may be influenced by a variety of environmental, educational, and cultural factors beyond knowledge.

Furthermore, our results showed that individuals who previously had a MRSA infection demonstrated higher knowledge scores, and we observed a positive correlation between their attitudes and behaviors. These outcomes are consistent with literature that has found that strong perceptions and attitudes about hand hygiene influence patients’ decisions when choosing a health care facility and physician, especially in those with a previous HAI.
Those with a history of HAI also have been shown to have greater awareness of infections, risk factors, health consequences, and prevention techniques. Additionally, those with quadriplegia or tetraplegia had higher knowledge scores. This outcome could be the result of impaired hand function in these individuals, which requires assistance for hand hygiene behavior. Because they require assistance, having higher knowledge of their risks may encourage them to ask for help with tasks such as handwashing.

There were several limitations in this study. The study population consisted primarily of patients who were men, and our sample size was small. Furthermore, respondents’ self-reported behaviors were not independently validated. In addition, the survey questions were evaluated for face validity, but we did not conduct psychometric property testing on the surveys to assess construct validity. We did not measure knowledge and attitudes toward hand hygiene specifically; however, hand hygiene is a critical part of MRSA prevention, and our findings have implications for devising strategies for MRSA prevention in those with SCI/D.

Knowledge and attitudes, although related, do not appear to fully explain patients’ hand hygiene behavior. However, our results suggest the relationship between knowledge and attitudes could be a start in improving hand hygiene behavior for MRSA and other HAI's in those with SCI/D. Future studies should examine the impact of other factors that influence hand hygiene behaviors to reduce infections caused by multidrug-resistant organisms such as MRSA.

References