Methicillin Resistant Staphylococcus Aureus

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Description

Results

Ten-year decrease of acquired methicillin-resistant Staphylococcus aureus (MRSA) bacteremia at a single institution: the result of a multifaceted program combining cross-transmission prevention and antimicrobial stewardship (2015)

Chaffne,A., Klitzs,M., Bezie, Y., Benallai, A., Pamiczani, L., Nguyen, J., Damaj, M., Gorint,J., Rejassa, G., Goldstein, F., Carlet, J., and Misset, B.

Researchers implemented a hospital-wide intervention program, and measured the effects of these implementations on the nosocomial MRSA rates throughout the hospital. From 2000 to 2003, active screening and decontamination of Intensive Care Unit (ICU) patients, hospital wide use of alcohol based hand rubs (ABHR), controlling the use of specific classes of antibiotics, compliance audits, and feedback to the health care providers were implemented. The program efficacy was evaluated by nosocomial MRSA colonization rates per 1000 patient days in patients who were hospitalized for more than 24 hours.

Overall, compliance with standard precautions increased during the years of this study. (2000-2009)

The use of ABHR also increased from 6.8 Liters to 27.5 Liters per 1000 patient days. The use of broad spectrum antibiotics decreased by 31 percent per 1000 patient days. Nosocomial MRSA colonization decreased by 84 percent from 1.09 to 0.17 per 1000 patient days, with p<10

Comparison of control strategies for methicillin-resistant Staphylococcus aureus (2013)

Besseens, M., Lopez, K., c Guern, K., Hendriksen, K., Williams, S., O'Connor-Wright S., Granger, D.

MRSA transmission rates were compared following implementation of a bundle of control measures that included institutional culture change, surveillance for MRSA infection and transmission, and active screening for colonization in 2 similar Veterans Health Administration hospitals. One hospital employed control interventions as defined by the Centers for Disease Control and Prevention, and the other hospital modified contact precautions, requiring only the use of gowns.

During the 4-year study period, there were 1.58 MRSA transmissions per 1,000 patient-days at hospital A and 1.56 MRSA transmissions per 1,000 patient-days at hospital B (P = .96). Both hospitals experienced significant reductions in MRSA health-care-associated infections (HAI). There was no difference between hospital A and hospital B in incidence of MRSA HAI and MRSA surgical site infections. Annual acquisition costs for cover gowns were $183.69 at hospital A and $25.912 at hospital B

A controlled trial of universal gloving versus contact precautions for preventing the transmission of multidrug-resistant organisms (2007)

Bearman, G., Marra, A., Sessler, C., Smith, W., Rosato, A., Laplante, J., Wenzel, R., Edmond, M.

A study was conducted to determine if universal gloving or contact precautions are more effective in preventing the spread of MRSA. The study was conducted in two phases and compared transmission and compliance of healthcare workers using the outlined methods.

Hand hygiene compliance increased from 41.7% to 72.1% after the procedure. Overall compliance was only 34.3%. Compliance also increased when dealing with high risk patients or when healthcare providers were exposed to blood.

Discontinuation of Contact Precautions for Methicillin-Resistant Staphylococcus aureus: A Randomized Controlled Trial Comparing Passive and Active Screening With Culture and Polymerase Chain Reaction (2013)

Shenoy, E., Kim, J., Rosenberg, E., Cotter, J., Lee, H., Walensky, R., Hooper, D.

Patients with a history of MRSA infection were randomly placed into either passive or active screening. The primary outcome was Discontinuation of CPs by trial arm based on 3 negative cultures. In the intervention arm, sensitivity, specificity, and positive and negative predictive values of the first PCR were compared to cultures.

CPs were discontinued significantly more often with the patients who were actively screened and the screening method was more effective at actually detecting if MRSA was prevalent with the patients.

Hospital infection control strategies for vancomycin-resistant Enterococcus, methicillin-resistant Staphylococcus aureus and Clostridium difficile (2009)

Johnston, L., Bryce, E.

Authors reviewed articles that in order to find patterns in the prevention of infection transmission. Specifically MRSA. The four areas that were studied were hand hygiene, compliance with hand hygiene, the presence of foreign microorganisms in the hospital care setting, the effectiveness of using some form of barrier precautions and the effectiveness of MRSA screening.

Hand hygiene is the single most important measure for preventing the spread of infections. Compliance with hand hygiene measures is poor, even among physicians. Patient care environments may be the source of microorganisms, and should be kept clean and tidy. Barrier precautions play a role in preventing cross-transmission of microorganisms in acute care facilities. Screening of patients at high risk for colonization with methicillin-resistant Staphylococcus aureus (MRSA) or vancomycin-resistant enterococci may be cost-effective if coupled with barrier precautions.

Methods

This translational research study utilized a literature review design. Students searched for and analyzed research articles published within the last ten years. The scientific databases used to uncover current research for this topic included: EBSCOhost, CINAHL, and PubMed.

Keywords searched in the databases included: MRSA, standard precautions, contact precautions, infection control, hand hygiene, cost effectiveness, nosocomial, infections, prevention.

Students successfully completed the National Institute of Health (NIB) Office of Extramural Research’s online training, “Protecting Human Research Participants” and hold current certifications.

Strengths & Limitations

Strengths and limitations of the studies and data in this literature analysis include the overall agreement among researchers that the validity of evidence-based standard precautions, along with appropriate hand by gene compliance, remain the driving component to the control and prevention of MRSA transmission rates. A key limitation to the aforementioned literature analysis is the lack of definitive data available. Limited research directly impacts patient quality of care outcomes and leads to efficacy, productivity, as well as cost setbacks. Further examination of the risks and benefits related to contact precautions versus standard precautions is essential in the advancement of acute care.

Discussion & Results

These findings are based on a research literature review analysis of the results directly correlating to recent trials, demonstrating MRSA control strategies. The primary control measures focus on health care provider (HCP) compliance with policies and procedures related to the efficacy of improved hand hygiene, the use of contact precautions, quality of care given, and potential adverse outcomes of contact precautions (CPs). Additional infection control strategies include but are not limited to: patient isolation, chlorhexidine bathing, maintenance of aseptic environment, antimicrobial management, and associated costs. The research identified no significant clinical evidence supporting the utilization of CPs versus evidence-based standard precautions for controlling the transmission of MRSA in the acute healthcare setting. The effectiveness of CPs as a component of a multifaceted program designed for infection control has been well documented and remains the primary recommendation by the Centers for Disease Control and Prevention (CDC) in the prevention of MRSA transmission. However, utilization of CPs alone has not confirmed reduced MRSA transmission rates, and the efficacy is determined by HCP’s level of compliance.

Conclusion & Recommendations

Through rigorous critical appraisal of current research conducted on the prevention of nosocomial MRSA infections in the acute healthcare setting, one can conclude that there was no difference in nosocomial MRSA infection rates, when standard precautions alone were utilized versus when contact precautions were utilized. Proper hand hygiene performed by healthcare providers is the number one preventative measure to decrease the spread of MRSA within the acute healthcare setting.

References


Results

Does the utilization of contact precautions (I) by healthcare providers (P) in the acute care setting decrease the rate of nosocomial Methicillin Resistant Staphylococcus Aureus infections (O) compared to standard precautions (C)?

Purpose

The purpose of the research study is to determine if the use of contact precautions is more effective than the use of standard precautions in preventing nosocomial (hospital-acquired) MRSA infection transmission in the acute care setting.

Background/ Clinical Significance

According to the Centers for Disease Control and Prevention (CDC), Methicillin-resistant Staphylococcus aureus (MRSA) is defined as (2016), "A type of staph bacteria that is resistant to many antibiotics. In the healthcare setting, MRSA can cause severe problems such as bloodstream infections, pneumonia and surgical site infections. If not treated quickly, MRSA infections can cause sepsis and death. (The presence of MRSA in the acute healthcare setting has contributed to mortality and an increase in healthcare costs. Standard precautions are used universally throughout the healthcare setting to prevent infection. To further spread the prevention between MSAs and patients, staff have implemented the use of standard precautions as well as contact precautions. Contact precautions include vigorous hand washing before and after patient care, gloves, disposable gowns, and the isolation of MRSA-infected patients.

PICO Question

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