Medical News

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Acquisition of VRE During Scheduled Antimicrobial Rotation in an ICU

Scheduled rotation of treatment with gram-negative antimicrobial agents has been associated with reduction of serious gram-negative infections. The impact of this practice on other nosocomial infections has not been assessed. Puzniak and colleagues from the St Louis University School of Public Health conducted a study to determine if scheduled antimicrobial rotation reduced rates of acquisition of enteric vancomycin-resistant enterococci (VRE) among 740 patients admitted to an intensive care unit (ICU). The preferred gram-negative agent was ceftazidime during rotation 1 and ciprofloxacin during rotation 2. Unadjusted VRE acquisition rates were 8.5 cases per 1,000 ICU days during rotation 1 and 11.7 cases per 1,000 ICU days during rotation 2 ($P<.01$). However, scheduled antimicrobial rotation of ceftazidime with ciprofloxacin had no effect on the risk of acquiring VRE in the ICU after adjustment for known risk factors.

Independent predictors of acquisition of VRE were enteral feedings, higher colonization pressure, and increased duration of anaerobic therapy. The study findings can confirm no additional beneficial or adverse effect on VRE acquisition among ICU patients as a result of this practice.

FROM: Puzniak LA, Mayfield J, Leet T, Kollef M, Mundy LM. Acquisition of vancomycin-resistant enterococci during scheduled antimicrobial rotation in an intensive care unit. *Clin Infect Dis* 2001;33:151-157.

Patient Education Increases Staff Hand Washing

"Partners in Your Care," a patient-education behavioral model for increasing handwashing compliance and empowering patients with responsibility for their care, was evaluated in an acute-care hospital in Oxford, United Kingdom. McGuckin and coinvestigators conducted a controlled prospective intervention study comparing medical and surgical patients. Ninety-eight patients were eligible for the study.

Thirty-nine patients (40%) agreed to participate in the program, "Partners in Your Care," by asking all healthcare workers who were going to have direct contact with them, "Did you wash your hands?" Compliance with the program was measured through soap and alcohol use and hand washings per bed day before and after introduction of the program.

"Partners in Your Care" increased hand washing an average of 50%. Healthcare workers washed hands more often with surgical patients than with medical patients ($P<.05$). Alcohol gel was used on less than 1% of handwashing occasions. Sixty-two percent of patients in the study felt at ease when asking healthcare workers, "Did you wash your hands?" Seventy-eight percent received a positive response (ie, washed hands). All patients asked nurses, but only 35% asked physicians.

"Partners in Your Care" increased handwashing compliance in the United Kingdom. This program empowers patients with responsibility for their care, provides infection control staff with a continuing means for delivering handwashing education without additional staff, and can save costs for a hospital.

FROM: McGuckin M, Waterman R, Storr J, Bowler IC, Ashby M, Topley K, et al. Evaluation of a patient-empowering hand hygiene programme in the UK. *J Hosp Infect* 2001;48:222-227.

Antimicrobial Resistance in Food Animals Reduced by Limiting Antimicrobial Use

From 1995 to 2000, as part of the Danish program of monitoring for antimicrobial resistance, a total of 673 *Enterococcus faecium* and 1,088 *Enterococcus faecalis* isolates from pigs, together with 856 *E faecium* isolates from broilers, were tested for susceptibility to four classes of antimicrobial agents used for growth promotion. The four antimicrobials were avilamycin, erythromycin, vancomycin, and virginiamycin. Major changes in the use of antimicrobial agents for growth promotion have occurred during the last 6 years in Denmark. The government banned the use of avoparcin in 1995 and of virginiamycin in 1998. Furthermore, the producers have voluntarily stopped all use beginning in 1999.

The avoparcin ban in 1995 was followed by a decrease in the occurrence of glycopeptide-resistant *E faecium* (GRE) in broilers, from 72.7% in 1995 to 5.8% in 2000. The occurrence of glycopeptide resistance among isolates from pigs remained constant at around 20% from 1995 to 1997. It was shown that, in GRE from pigs, the genes encoding macrolide and glycopeptide resistance were genetically linked and that, following the decrease in the use of tylosin during 1998 and 1999, the occurrence of GRE in pigs decreased to 6.0% in 2000.

From 1995 to 1997, the occurrence of erythromycin resistance among *E faecium* and *E faecalis* isolates from pigs was almost 90%. Use of tylosin decreased considerably during 1998 and 1999, and this decrease was followed by

decreases in the occurrence of resistance to 46.7% and 28.1% among *E faecium* and *E faecalis* isolates from pigs, respectively. Erythromycin resistance among *E faecium* isolates from broilers reached a maximum of 76.3% in 1997, but decreased to 12.7% in 2000 concomitantly with more limited use of virginiamycin. Use of virginiamycin increased from 1995 to 1997 and was followed by an increased occurrence of virginiamycin resistance among *E faecium* isolates in broilers—from 27.3% in 1995 to 66.2% in 1997. In January 1998, the use of virginiamycin was banned in Denmark, and the occurrence of virginiamycin resistance decreased to 33.9% in 2000.

Use of avilamycin increased from 1995 to 1996 and was followed by an increase in avilamycin resistance among *E faecium* isolates from broilers, from 63.6% in 1995 to 77.4% in 1996. Since 1996, avilamycin usage has decreased, followed by a decrease in resistance to 4.8% in 2000. These results show that it is possible to reduce the occurrence of antimicrobial resistance in a national population of food animals when the selective pressure is removed. Cases in which resistance to vancomycin was linked to resistance to erythromycin were exceptions. In such cases, resistance did not decrease until the use of both avoparcin and tylosin was limited.

FROM: Aarestrup FM, Seyfarth AM, Emborg HD, Pedersen K, Hendriksen RS, Bager F. Effect of abolishment of the use of antimicrobial agents for growth promotion on occurrence of antimicrobial resistance in fecal enterococci from food animals in Denmark. *Antimicrob Agents Chemother* 2001;45:2054-2059.

AHRQ Issues Report on Evidence-Based Practice for Patient Safety

The Agency for Healthcare Research and Quality (AHRQ) recently released a report, *Making Health Care Safer, A Critical Analysis of Patient Safety Practices.* The report reviews data on 79 specific patient safety practices. Among the 11 "highly proven" practices (mostly clinical interventions) are pre-operative administration of antibiotics to prevent infections and beta-blockers to prevent heart attacks during or after surgery. Researchers from the University of California at San Francisco, Stanford University, were commission by AHRQ to prepare the report for AHRQ. The report is based on a review of the medical literature on safety practices and on consultation with healthcare experts, focusing on issues relevant to care delivered in hospitals and on prevalent diseases and procedures. Practices were excluded if there were few or no scientific studies to support them, and more than a dozen practices long considered important by patient safety experts did not make the list.

The five chapters in the "Infection Control" section address handwashing compliance; barrier precautions; impact of antibiotic-use practices; and prevention of nosocomial urinary tract infections, intravascular catheter-associated infections, and ventilator-associated pneumonia. The chapters are all structured similarly, providing background on the practice in question, opportunities for impact, study design and outcomes, evidence for effectiveness, potential for harm, cost of implementation, and a concluding comment. The narrative is followed by a tabular listing of studies, including description of the interventions, type of study design, and statistical results. Each chapter concludes with actual study citations.

AHRQ recognizes that there are gaps in each area, that more research is needed to determine which practices are most effective in improving patient safety, and that it needs to be determined how complex or costly they would be to implement. The National Forum for Health Care Quality Measurement and Reporting, a coalition of providers, consumers, purchasers, employers, and accrediting bodies, intends to use the report to develop a checklist of measures that patients may use to determine the actions hospitals and health facilities have taken to improve safety.

The report can be obtained by calling the AHRQ Publications Clearinghouse at (800) 358-9295 or sending an e-mail message to ahrqpubs@ahrq.gov. The report can be downloaded from the AHRQ web site as a pdf file, or viewed or printed online by chapter at www.ahcpr.gov/clinic/ptsafety.

Enterococcus faecalis Surface Protein and Urinary Tract Infections

Enterococcus faecalis isolated from patients with bacteremia, endocarditis, and urinary tract infections more frequently express the surface protein Esp than do fecal isolates. Shankar and colleagues from the University of Oklahoma Health Sciences Center, Oklahoma City, conducted a study to assess the role of Esp in colonization and persistence of *E faecalis* in an animal model of ascending urinary tract infection. They compared an Esp(+) strain of *E faecalis* to its isogenic Esp-deficient mutant. Groups of CBA/J mice were challenged transurethrally with 10^8 colony-forming units of either the parent or mutant strain; bacteria in the urine, bladder, and kidneys were enumerated 5 days postinfection.

Significantly higher numbers of bacteria were recovered from the bladder and urine of mice challenged with the parent strain than from the bladder and urine of mice challenged with the mutant. Colonization of the kidney, however, was not significantly different between the parent and mutant strains. Histopathological evaluations of kidney and bladder tissue done at 5 days' postinfection did not show marked histopathological changes consistent with inflammation, mucosal hyperplasia, or apoptosis, and there was no observable difference between the mice challenged with the parent and those challenged with the mutant.

The authors concluded that, while Esp does not influence histopathological changes associated with acute urinary tract infections, it contributes to colonization and persistence of *E faecalis* at this site.

FROM: Shankar N, Lockatell CV, Baghdayan AS, Drachenberg C, Gilmore MS, Johnson DE. Role of