

## Medical News

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Additional news items in this issue: *Nosocomial Infections in a Neurosurgery ICU*, page 259; *Bacterial Contamination of Tube Feedings*, page 269; *Surgical-Site Infections in Mexico*, page 277; *Antibiotic and Biocide Resistance in MRSA and VRE*, page 284.

### Povidone Iodine Versus Chlorhexidine for Insertion of Peripheral Catheters

Traore and coinvestigators recently reported on a randomized study performed in two groups of 22 volunteers to compare the in vivo bactericidal effect of two rapid disinfection procedures, using povidone iodine (PVP-I) in scrub formulation followed by alcoholic PVP-I or chlorhexidine in scrub formulation followed by alcoholic chlorhexidine. The products were tolerated well in both groups. The two procedures had comparable rapid bactericidal activity in vivo. Bacteria were recovered using the cylinder scrub method.

Comparison of reductions in the aerobic and anaerobic flora from baseline levels to each of the three sampling times (30 seconds, 3 minutes, 2 hours) showed no significant difference between the two procedures (log<sub>10</sub> reduction after 30 seconds was approximately 1.5 for the aerobic flora and 1.1 for the anaerobic flora). After 3 minutes, the corresponding values were 2.1 and 1.8; after 2 hours, 2.0 and 1.3.

FROM: Traore O, Allaert FA, Fournet-Fayard S, Verriere JL, Laveran H. Comparison of in-vivo antibacterial activity of two skin disinfection procedures for insertion of peripheral catheters: povidone iodine versus chlorhexidine. *J Hosp Infect* 2000;44:147-150.

### Implications of Vancomycin-Resistant *Staphylococcus aureus*

Dr. Fred Tenover from the CDC's Hospital Infections Program indicates that strains of *Staphylococcus aureus* with reduced susceptibility to glycopeptides have been reported from Japan (multiple strains), Hong Kong, Korea, the United States (four strains), France, the United Kingdom, and Spain. The isolates from the United States and France, and strain Mu50 from Japan, demonstrate vancomycin minimum inhibitory concentrations (MICs) of 8 µg/mL by broth microdilution testing and appear to have developed from preexisting methicillin-resistant *S aureus* infections. The strain from the United Kingdom and other parts of Europe appears heteroresistant to vancomycin and has MICs in the 1 to 2 µg/mL range. Many of the isolates with reduced susceptibility to glycopep-

tides have been associated with therapeutic failures with vancomycin. Although nosocomial spread of the glycopeptide-intermediate *S aureus* (GISA) strains has not been observed in US hospitals or in Europe, spread of GISA strains has apparently occurred in Japan.

Laboratory studies have indicated that the disk-diffusion test, the Stoke's method, and several automated methods of antimicrobial susceptibility testing do not detect GISA strains. The requirement to choose from a relatively small number of acceptable techniques for screening may influence the ability of laboratories to conduct surveillance for these organisms. Finally, the isolation of such strains in three geographically distinct regions suggests that this phenomenon will continue to occur worldwide.

FROM: Tenover FC. Implications of vancomycin-resistant *Staphylococcus aureus*. *J Hosp Infect* 1999;43 (suppl):S3-S7.

### Residential Care and the Elderly: The Burden of Infection

Dr. Richard Garibaldi from the University of Connecticut Health Center, Department of Medicine, Farmington, Connecticut, recently reviewed the epidemiology of infections in long-term-care facilities. Included were different types of healthcare settings, each with their own unique infectious disease problems. The article focuses on the epidemiological considerations, risk factors, and types of infections that occur in elderly patients institutionalized in nursing home settings. Nursing home patients are uniquely susceptible to infections because of the physiological changes that occur with aging, the underlying chronic diseases of the patients, and the institutional environment within which residents socialize and live. Patients in nursing homes have more complicated medical conditions than they did 5 years ago, as they become even more elderly, and the trend continues toward shorter hospital stays in acute-care facilities.

In nursing home settings, problems with infections may be more difficult to diagnose because of their subtle presentations, the presence of co-morbid illnesses that obscure the symptoms of infection, and the lack of on-site diagnostic facilities. Delays in diagnosing and treating

infections allow transmission to occur within the facility. Both endemic and epidemic infections occur relatively commonly in nursing homes. The incidence of endemic infections, such as catheter-associated urinary tract infections, lower respiratory infections, and skin infections, is influenced by the debility level of the patients. Calculations of infection rates are influenced by the intensity of surveillance methods at each institution. Many endemic infections are unpreventable.

Epidemic infections account for 10% to 20% of nursing home infections. These include clusters of upper or lower respiratory infections, gastroenteritis, diarrhea, and catheter-associated urinary tract infections. Epidemic infections are potentially preventable with sound infection control practices. Special attention must be paid to promote Universal Precautions and give certain patients, such as those with known infection or colonization with *Clostridium difficile*, methicillin-resistant *Staphylococcus aureus*, or vancomycin-resistant enterococci, special consideration. The potential for epidemic infections with antibiotic-resistant organisms is real. In the nursing home setting, strong infection control programs must be in place to monitor the occurrence of institutionally acquired infections and to initiate control strategies to prevent the spread of epidemic infections. Education in infection control issues and attention to employee health are essential to enable staff to care appropriately for today's nursing home population and to prepare them for the even more complicated patients who will be cared for in this type of setting in future.

FROM: Garibaldi RA. Residential care and the elderly: the burden of infection. *J Hosp Infect* 1999;43 (suppl):S9-S18.

### Survival of Enterococci and Staphylococci on Hospital Fabrics and Plastic

The transfer of gram-positive bacteria, particularly methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE), among patients is a growing concern. One aspect of bacterial transfer is the ability of the microorganism to survive on various common hospital surfaces. Neely and Maley from the Shriners Hospitals for Children, University of Cincinnati College of Medicine, conducted a study to determine the survival of 22 gram-positive bacteria (vancomycin-sensitive and -resistant enterococci and methicillin-sensitive and -resistant staphylococci) on five common hospital materials: smooth 100% cotton (clothing), 100% cotton terry (towels), 60% cotton-40% polyester blend (scrub suits and laboratory coats), 100% polyester (privacy drapes), and 100% polypropylene plastic (splash aprons). Swatches were inoculated with  $10^4$  to  $10^5$  colony-forming units of a microorganism, assayed daily by placing the swatches in nutritive media, and examined for growth after 48 hours. All isolates survived for at least 1 day, and some survived for more than 90 days on various materials. Smaller inocula ( $10^2$ ) survived for shorter times, but still generally for days.

The authors concluded that antibiotic sensitivity had no consistent effect on survival. The long survival of these bacteria, including MRSA and VRE, on commonly used hospital fabrics, underscores the need for meticulous contact control procedures and careful disinfection to limit the spread of these bacteria.

*Editorial note:* The authors have confirmed that gram-positive bacteria such as enterococci and staphylococci are more hardy than most gram-negative bacteria and that antibiotic resistance does not affect survival in the environment. There have been a number of studies to determine the factors associated with the transmission of MRSA and VRE among hospitalized patients. Clearly, cross-contamination via hands of healthcare personnel has been found to be a major risk factor for transmission. Although bacteria have been shown to survive on fabrics, they have not been directly associated with transmission of VRE or MRSA.

FROM: Neely AN, Maley MP. Survival of enterococci and staphylococci on hospital fabrics and plastic. *J Clin Microbiol* 2000;38:724-726.

### Vancomycin Treatment and Hospital-Acquired VRE: A Meta-analysis

The association between vancomycin hydrochloride treatment and vancomycin-resistant enterococci (VRE) has been investigated in numerous studies with variable results. Carmeli and colleagues from Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, conducted a meta-analysis to estimate the magnitude of the association between vancomycin treatment and individual risk of VRE and to identify study characteristics that accounted for heterogeneity in study results.

Studies were identified using MEDLINE, searching the index with terms "*Enterococcus*," "*Enterococcus faecalis*," or "*Enterococcus faecium*" and "vancomycin," "drug resistance," "drug resistance, microbial," or "drug resistance, multiple or risk factors." Reports from conferences and reference lists of recent reviews were used. A total of 420 published reports and 98 conference reports were reviewed; 20 studies described in 15 published reports were included in the analysis. They recorded study period, hospital setting, case and control definitions, length of hospital stay, method of adjustment for differences in length of stay, and data on treatment with vancomycin.

The odds ratio (OR) of vancomycin treatment provided the measure of association analyzed. A random-effects model was used to estimate the pooled OR. When results from all 20 studies were combined, the pooled OR was 4.5 (95% confidence interval [CI<sub>95</sub>], 3.0-6.9), but the test for heterogeneity was highly significant ( $P < .001$ ). The 5 studies that used patients with vancomycin-susceptible enterococci as controls found a stronger association (pooled OR, 10.7; CI<sub>95</sub>, 4.8-23.8) than the 15 studies that used controls who had no VRE isolated (pooled OR, 2.7; CI<sub>95</sub>, 2.0-3.8). After restricting the analysis to the latter