Medical News

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Risk Factors for VRE Infection

Investigators at Cornell University Medical College in New York City conducted one of the largest case control studies to date to determine risk factors for vancomycin resistance and mortality in patients with *Enterococcus faecium* colonization or infection. The study was conducted by comparing 145 patients who had vancomycin-resistant *E faecium* (VREF) isolates (cases) to 145 patients with vancomycin-susceptible *E faecium* (VSEF) isolates (controls). The number of deaths per 100-person days of hospitalization after diagnosis did not differ significantly between VREF patients (1.2) and VSEF patients (0.8).

Multivariate analyses found that the duration of hospitalization (>7 days), intrahospital transfer between floors, use of antimicrobials (ie, vancomycin and third-generation cephalosporins), and duration of vancomycin use (>7 days) were independently associated with VREF infection or colonization. In addition, there was a significant association between hemodialysis and acquisition of VREF.

This study confirms earlier observations regarding VREF infection or colonization and identifies risk factors that may be used to develop strategies for prevention and control of this emerging nosocomial problem.

FROM: Tornieporth NG, Roberts RB, John J, et al. Risk factors associated with vancomycin-resistant *Enterococcus faecium* infection or colonization in 145 matched case patients and control patients. *Clin Infect Dis* 1996;23:767-772.

Reuse of Medical Devices

ECRI has developed a "Special Report on the Reuse of Single-Use Medical Devices: Making Informed Decisions." This report presents an objective assessment of reuse and offers decision-making support for healthcare providers, policy makers, and others investigating reuse as a cost-saving measure.

In the 1950s, plastic medical devices were introduced as an inexpensive alternative to durable reusable products. Because they could not withstand the rigors of steam sterilization, these plastic devices were considered disposable. Once introduced, the concept of single-use medical devices and their convenience swept through the medical-device industry. Many single-use devices can be costly, ranging from hundreds to thousands of dollars per device. Others, such as syringes, are less expensive, but are used in such large quantities that they have drawn attention as an opportunity for cost savings. Advances in the science of sterilization have made it possible to safely sterilize some single-use medical devices. However, the healthcare community continues to struggle with issues related to cost-effectiveness of reuse balanced against the potential impact on quality and safety of patient care.

Issues covered in this report include an analysis of evidence regarding safety of reuse, occupational safety and health risks, reuse protocols, economic analysis tools, analysis of clinical studies, information on outsourcing companies, and sample policies and procedures.

ECRI is a nonprofit health services research agency. For information about this report, contact ECRI, 5200 Butler Pike, Plymouth Meeting, PA 19462-1298; telephone 610-825-6000, or fax 610-834-1275.

FROM: ECRI. Press release: Reuse of single-use medical devices: does this cost cutting measure affect the quality of patient care? ECRI: Plymouth Meeting, PA. November 15, 1996.

New York City Outbreak Accounts for 25% of US Cases of MDR-TB

Many outbreaks of drug-resistant strains of *Mycobacterium tuberculosis* occurred in New York City, and several have involved one strain (referred to as strain W) predictably resistant to at least six, and usually seven, antituberculosis agents: isoniazid, rifampin, ethambutol hydrochloride, streptomycin sulfate, kanamycin sulfate, rifabutin, and, usually, ethionamide. Susceptibility to pyrazinamide, which was difficult to test, has been variable. These outbreaks largely have involved HIV-infected patients and healthcare workers. Mortality was 80% to 90% in the reported outbreaks, with death occurring a median of 1 to 4 weeks after onset of disease.

The New York City (NYC) Department of Health investigated every tuberculosis patient reported in New York City from January 1, 1990, to August 1, 1993, to determine the number who had disease caused by the W strain. Of the 357 patients who met the case definition and were found to be infected with the W strain, 267 had identical or nearly identical restriction fragment-length polymorphism (RFLP) analysis; isolates from the other 90 patients were not available.

Epidemiological linkages were identified for 70% of patients of whom 96% likely had nosocomially acquired disease at 11 hospitals. Survival was prolonged among patients who received medications to which their isolate was susceptible, especially capreomycin sulfate. Most patients had nosocomially acquired disease, were infected with HIV, and, unless promptly and appropriately treated, died rapidly. With appropriate directly observed therapy, especially combinations including an injectable medication, even severely immunocompromised patients had culture conversion and prolonged, tuberculosis-free survival.

The authors note that this was the most extensive and most highly resistant outbreak of multidrug-resistant tuberculosis reported to date. This outbreak accounted for nearly one fourth of the cases of multidrug-resistant tuberculosis in the United States during the 43-month period. Based on the number of days in the hospital, the estimated

direct cost of care for these patients exceeded $23 million.

Since this investigation ended (August 1, 1993), there were 82 additional RFLP-confirmed patients that met the case definition; the outbreak began with 15 RFLP-confirmed cases in 1990, peaked with 122 cases in 1992, and decreased to 19 cases in 1995.

FROM: Frieden TR, Sherman LF, Maw KL. A multi-institutional outbreak of highly drug-resistant tuberculosis. *JAMA* 1996;276:1229-1235.

Routine Cultures of Environment for *Legionella?*

Ever since *Legionella pneumophila* was isolated and characterized and typing systems became available, there has been a seemingly endless debate between those who promote the strategy of routinely monitoring hospital water for the microorganism and those (notably Centers for Disease Control and Prevention) who maintain that such monitoring is basically a waste of resources, because all hospital water is colonized with *L pneumophila,* and disease surveillance should be the prime priority.

Researchers at the VA Medical Center and the University of Pittsburgh School of Medicine in Pittsburgh, Pennsylvania, reported on a study that supports the case for routine environmental cultures of hospital water. Surveillance for Legionnaires' disease in hospitalized patients with fever and pulmonary infiltrates was done for 12 months. For every patient with nosocomial pneumonia, additional tests for legionellae were performed for urinary antigen, sputum culture, and serology. Cultures of the environment for legionellae was done in patient-care areas and the hot-water storage tanks of the hospital. Pulsed-field gel electrophoresis (PFGE) was used as a typing system to determine concordance between patient and environmental isolates.

Of 102 patients identified during the study period, 3 had nosocomial pneumonia caused by *L pneumophila* Serogroup 5. This serogroup was recovered from 4 of 5 hot-water storage tanks (10-1,000 CFU/mL). Furthermore, the hospital water supply was colonized with *L pneumophila* Serogroup 5, as shown by studies conducted over a 10-year period; isolates were available from 1984, 1986, and 1994. No other serotypes were isolated. The Serogroup Type 5 isolates from the three infected patients had the same PFGE pattern as the Serogroup 5 isolates from the water supply. In contrast, 12 *L pneumophila* serogroup isolates from eight other institutions had different PFGE patterns. The authors conclude that routinely obtaining cultures for legionellae from the environment may be important in stimulating the application of laboratory testing for *Legionella,* which can identify unsuspected patients with nosocomial Legionnaires' disease.

FROM: Chang FY, Jacobs SL, Colodny SM, Stout JE, Yu VL. Nosocomial Legionnaires' disease caused by *Legionella pneumophila* Serogroup 5: laboratory and epidemiologic implications. *J Infect Dis* 1996;174:1116-1119.

New Finding on Biofilm and Coagulase-Negative Staphylococci

Coagulase-negative staphylococci, for the most part *Staphylococcus epidermidis,* are the most frequent organisms responsible for infections of implanted medical devices. Strains of these organisms have been shown in the laboratory to produce a macroscopically visible, adherent biofilm on test tubes or plates, and the biofilm production occurs in two phases. First, there is rapid primary attachment of *S epidermidis* cells to a surface, followed by accumulation of cells in multilayered cell clusters. The latter phase requires intracellular adhesion, and a specific polysaccharide has been described: polysaccharide intercellular adhesin (PIA), which is different from the many other polysaccharides produced by the organism.

Researchers at the Institute for Medicine, Microbiology, and Immunology at the University of Eppendorf, Hamburg, Germany, studied the association of biofilm production with expression of PIA in 179 isolates of *S epidermidis.*

They found that there was a significant positive association between biofilm production and PIA expression: 86.8% of biofilm-producing strains produced PIA. In contrast, 88.6% of biofilm negative strains did not express PIA.

The authors conclude that PIA is an important factor involved in biofilm accumulation of the majority of *S epidermidis* clinical isolates and that studies to determine clinical relevance are needed.

FROM: Mack D, Haeder M, Siemssen N, Laufs R. Association of biofilm production of coagulase-negative staphylococci with expression of a specific polysaccharide intercellular adhesin. *J Infect Dis* 1996;174:881-884.

Restrict Antibiotics, Control VRE

Vancomycin-resistant enterococci (VRE) have evolved to the point where they are major nosocomial pathogens. They can be the infection control practitioners' worst nightmare when increasingly found in the gut of patients and the CDC's recommendations are not working. Such is the plight of investigators from the Brooklyn VA Center, who describe the battle with VRE that began in the fall of 1991. Cultures of nosocomial VRE were increasing, as were the number of patients who were colonized with VRE. In spring 1993, a number of infection control steps were initiated at the hospital: VRE patients were placed in private rooms in isolation; the inguinal and perineal areas of infected patients were washed with chlorhexidine; gloves were required by staff, and they also used chlorhexidine soap for handwashing; electronic thermometers were removed; and an infection control clinician made frequent rounds to reinforce adherence to these measures. In addition, a 1:100 dilution of household bleach was used to clean environmental surfaces.

When a point prevalence survey performed in January 1995 showed that there was still widespread gastrointestinal colonization with VRE, a second intervention