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

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