

tions and MRSA/VRE cultured from enteral feeding tubes used in the same neonatal intensive care unit during the same time period but in different neonates. DNA fingerprinting then was used to compare MRSA and VRE cultured from feeding tubes with MRSA/VRE isolates cultured from clinical infections.

There were 23 *S. aureus* isolates; 12 of 23 were methicillin resistant (MRSA). There were 4 MRSA infections in patients without feeding tubes. DNA fingerprinting showed that the MRSA species causing each of the clinical infections also was in the feeding tubes of other infants. There were no VRE infections during the study period.

The authors concluded that feeding tubes are a reservoir for antibiotic-resistant pathogens that can be transmitted to other infants.

FROM: Mehall JR, Kite CA, Gilliam CH, Jackson RJ, Smith SD. Enteral feeding tubes are a reservoir for nosocomial antibiotic-resistant pathogens. *J Pediatr Surg* 2002;37:1011-1012.

Intranasal Mupirocin to Prevent Postoperative *Staphylococcus aureus* Infections

Patients with nasal carriage of *Staphylococcus aureus* have an increased risk of surgical-site infections caused by that organism. Treatment with mupirocin ointment can reduce the rate of nasal carriage and may prevent postoperative *S. aureus* infections. Perl, from Johns Hopkins, Baltimore, Maryland, and co-investigators, from the University of Iowa Colleges of Medicine and Public Health, Iowa City, conducted a randomized, double-blind, placebo-controlled trial to determine whether intranasal treatment with mupirocin reduces the rate of *S. aureus* infections at surgical sites and prevents other nosocomial infections.

Of 4,030 enrolled patients who underwent general, gynecologic, neurologic, or cardiothoracic surgery, 3,864 were included in the intention-to-treat analysis. Overall, 2.3% of mupirocin recipients and 2.4% of placebo recipients had *S. aureus* infections at surgical sites. Of the 891 patients (23.1% of the 3,864 who completed the study) who had *S. aureus* in their anterior nares, 444 received mupirocin and 447 received placebo. Among the patients with nasal carriage of *S. aureus*, 4.0% of those who received mupirocin had nosocomial *S. aureus* infections, as compared with 7.7% of those who received placebo (odds ratio for infection, 0.49; 95% confidence interval, 0.25 to 0.92; $P = .02$).

The authors concluded that prophylactic intranasal application of mupirocin did not significantly reduce the rate of *S. aureus* surgical-site infections overall, but it did significantly decrease the rate of all nosocomial *S. aureus* infections among the patients who were *S. aureus* carriers.

FROM: Perl TM, Cullen JJ, Wenzel RP, et al. Intranasal mupirocin to prevent postoperative *Staphylococcus aureus* infections. *N Engl J Med* 2002;346:1871-1877.

Risk of Airborne Transmission of MRSA in an Otolaryngology Surgery Unit

Shiomori and colleagues from the University of Occupational and Environmental Health, School of Medicine, Kitakyushu, Japan, conducted a study to quantitatively investigate the existence of airborne methicillin-resistant *Staphylococcus aureus* (MRSA) in a hospital environment. They performed phenotyping and genotyping of MRSA isolates to study MRSA epidemiology. They also performed prospective surveillance of patients with MRSA infections or colonization. Air samples were taken by an air sampler; samples were also obtained from object surfaces. An epidemiologic study of MRSA isolates was performed with an antibiotic susceptibility test, coagulase typing, and pulsed-field gel electrophoresis. The study was conducted in three single-patient rooms in a 37-bed otolaryngology-head and neck surgery unit. Three patients with squamous cell head and neck cancer were observed to have been colonized or infected with MRSA after surgery.

The MRSA samples were collected from the air in single-patient rooms during both a period of rest and when bed sheets were being changed. Isolates of MRSA were detected in all stages (from stage 1 [$> 7 \mu\text{m}$] to stage 6 [0.65 to $1.1 \mu\text{m}$]). Approximately 20% of the MRSA particles were within a respirable range of less than $4 \mu\text{m}$. MRSA was also isolated from inanimate objects, such as sinks, floors, and bed sheets, in the rooms of the patients with MRSA infections and from the patients' hands. An epidemiologic study demonstrated that clinical isolates of MRSA in the patient ward were of one origin and that the isolates from the air and from inanimate objects were identical to the MRSA strains that caused infection or colonization in the patients.

The authors concluded that MRSA was recirculated among the patients, the air, and the inanimate objects, especially when there was movement in the rooms. Airborne MRSA may play a role in MRSA colonization in the nasal cavity or in respiratory tract MRSA infections. Measures should be taken to prevent the spread of airborne MRSA to control nosocomial MRSA infection in hospitals.

FROM: Shiomori T, Miyamoto H, Makishima K. Significance of airborne transmission of methicillin-resistant *Staphylococcus aureus* in an otolaryngology-head and neck surgery unit. *Arch Otolaryngol Head Neck Surg* 2001;127:644-648.

Nosocomial Outbreak of Fluoroquinolone-Resistant Salmonella Infection

Infection with fluoroquinolone-resistant strains of salmonella is rare, as is nosocomial salmonella infection. Olsen and colleagues from the Division of Bacterial and Mycotic Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, describe the first recognized outbreak of fluoroquinolone-resistant salmonella infections in the United States, which occurred in two nursing homes and one hospital in Oregon. They interviewed medical staff and reviewed patients' charts and death certificates. In

nursing home A, they conducted a case-control study. Patients were defined as residents of the nursing home from whom fluoroquinolone-resistant *Salmonella enterica* serotype Schwarzengrund was isolated between February 1996 and December 1998. Control patients were residents with similar medical conditions whose cultures did not yield salmonella. Isolates were compared using pulsed-field gel electrophoresis and sequence analysis. Pharmacy records were compared on the use of fluoroquinolone among several nursing homes.

Eleven patients with fluoroquinolone-resistant salmonellosis were identified at two nursing homes. The index patient had been hospitalized in the Philippines and had probably acquired the infection there. Transmission was probably direct (from patient to patient) or through contact with contaminated surfaces. Treatment with fluoroquinolones during the 6 months before a culture was obtained was associated with a significant risk of salmonella infection (4 of 5 patients had taken fluoroquinolones, as compared with 2 of 13 control patients). The patients were not significantly more likely than the control patients to have taken other antibiotics. More fluoroquinolones were used at nursing home A than at similar nursing homes in Oregon. The isolates from the outbreak had similar patterns on pulsed-field gel electrophoresis and the same *gyrA* mutations. The isolates from the outbreak were also similar to the only previous isolate of fluoroquinolone-resistant salmonella in the United States, which came from a patient in New York who had been transferred from a hospital in the Philippines.

This was a prolonged nosocomial outbreak of infection with fluoroquinolone-resistant *S. enterica* serotype Schwarzengrund. More outbreaks such as this are likely in institutional settings, particularly those in which there is heavy use of antimicrobial agents.

FROM: Olsen SJ, DeBess EE, McGivern TE, et al. A nosocomial outbreak of fluoroquinolone-resistant salmonella infection. *N Engl J Med* 2001;344:1572-1579.

Airplane Cabin Air Recirculation and Risk of Upper Respiratory Tract Infection

In recent years, new commercial aircraft have been designed to recirculate approximately 50% of the cabin air to increase fuel efficiency. Some older aircraft use only fresh air. Whether air recirculation increases the transmission of infectious disease is unknown; some studies have demonstrated higher rates of the common cold among individuals working in buildings that recirculate air.

Zitter and colleagues recently evaluated the role of air recirculation as a predictor of postflight upper respiratory tract infections (URIs). They conducted a natural experiment among 1,100 passengers departing the San Francisco Bay area in California and traveling to Denver, Colorado, during January through early April 1999, and who completed a questionnaire in the boarding area and a follow-up telephone interview 5 to 7 days later. Forty-seven percent traveled aboard airplanes using 100% fresh air for ventilation, and 53% traveled aboard aircraft that recirculated cabin air. The main outcome measure was the incidence of reporting new URI symptoms within 1 week of the flight.

Passengers on airplanes that did and did not recirculate air had similar rates of postflight respiratory symptoms. The rates of reporting a cold were 19% versus 21% ($P = .34$); a runny nose and a cold, 10% versus 11% ($P = .70$); and an aggregation of 8 URI symptoms, 3% in both groups ($P > .99$). Results were similar after statistical adjustment for potential confounders.

The authors found no evidence that aircraft cabin air recirculation increases the risk for URI symptoms in passengers traveling aboard commercial jets.

FROM: Zitter JN, Mazonson PD, Miller DP, Hulley SB, Balmes JR. Aircraft cabin air recirculation and symptoms of the common cold. *JAMA* 2002;288:483-486.