Suspected Airborne Transmission of MRSA on Surgical Ward

Shiomori and coinvestigators, from the University of Occupational and Environmental Health, School of Medicine, Kitakyushu, Japan, conducted a study to investigate quantitatively the existence of airborne methicillin-resistant *Staphylococcus aureus* (MRSA) in a hospital environment and to perform phenotyping and genotyping of MRSA isolates to study MRSA epidemiology. They performed prospective surveillance of patients with MRSA infections or colonization. Air samples were taken by an air sampler, and samples were obtained from object surfaces. An epidemiological study of MRSA isolates was performed with antibiotic susceptibility tests, 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 of the air sampler (from stage 1 [>7 μm] to stage 6 [0.65-1.1 μm]). Approximately 20% of the MRSA particles were within a respirable range of less than 4 μm. MRSA also was isolated from inanimate environments, such as sinks, floors, and bed sheets, in the rooms of the patients with MRSA infections, as well as from the patients' hands. An epidemiological study demonstrated that clinical isolates of MRSA in a patient ward were of one origin and that the isolates from the air and from inanimate environments were identical to the MRSA strains that caused infection or colonization in the inpatients.

The authors concluded that MRSA was recirculated among the patients, the air, and the inanimate environments, 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 Infection Surveillance in US Children's Hospitals

Nosocomial infections (NIs) and antimicrobial resistance are major causes of mortality and morbidity and have become a major public health focus. To date, most national and international NI surveillance and prevention activities have been focused on adults, despite the fact that pediatric patients are at high risk for NIs because of their immature immune systems and prevalent device use. In 1997 the Hospital Infections Program at the CDC and the National Association of Children's Hospitals and Related Institutions partnered to establish a Pediatric Prevention Network. Infection control professionals and their hospital administrators at all children's hospitals were invited to participate. The objectives of the network are to establish baseline infection rates; design, implement, and evaluate prevention interventions; establish benchmark rates and best practices; and serve as a site for multicenter studies to improve outcomes for hospitalized children. This network serves as a model for quality improvement systems in health care.

Fifty participating children's hospitals were surveyed in 1998 to determine NI surveillance methods used and neonatal intensive care unit (NICU) and pediatric intensive care unit (PICU) 1997 NI rates. Data were collected on standardized forms and entered and analyzed by using SPSS for Windows (SPSS, Chicago, IL).

Forty-three (86%) children's hospitals returned a completed questionnaire. All reported conducting NICU and PICU NI surveillance (range, 2-12; median, 12 months). Nineteen children's hospitals provided NICU NI rate data in one or more formats suitable for comparison. Denominators used for NICU NI rate calculations varied: 17 reported overall NI by patient-days; 19 reported bloodstream infection (BSI) by central venous catheter (CVC)-days, and 8 reported BSI by patient-days. Sixteen children's hospitals reported NICU BSI data stratified by CVC-days and birth-weight cohort, and ventilator-associated pneumonia (VAP) by birth-weight cohort was reported by 12. Twenty-four children's hospitals reported PICU NI rate data in one or more formats suitable for comparison. Denominators used for PICU NI rate calculations also varied: 20 reported overall NI rates by patient-days; 23 reported BSI rates by CVC-days, and 10 reported BSI rates by patient-days; 24 reported VAP by ventilator-days; and 15 reported urinary tract infections (UTIs) by urinary catheter-days. Median overall NI rates per 1,000 patient-days were 8.9 in NICUs and 13.9 in PICUs. Median NICU NI device-associated rates by birth weight (>2,500 g, 1,501-2,500 g, 1,001-1,500 g, and ≤1,000 g) were as follows: BSI: 4.4, 4.7, 8.9, and 12.6; and VAP: 0.9, 1.1, 4.9, and 3.5, respectively. Median PICU NI rates per 1,000 device-days were 6.5 for BSI; 3.7 for VAP; and 5.4 for UTI.

It was concluded that the number of months that NICU or PICU NI surveillance was conducted varied among hospitals. Reported NICU and PICU NI rates varied by hospital; some reported overall NI rates, and others focused on one or more particular sites of infection (eg, BSI or pneumonia). Many did not provide NICU device-associated rates stratified by birth-weight group. Denominators used to calculate device-associated infection rates also varied, with hospitals reporting either patient-days or device-days. These findings suggest the need to determine reasons for variations and to identify optimal NI surveillance methods at children's hospitals, so that valid interhospital NI rate comparisons can be made.

FROM: Stover BH, Shulman ST, Bratcher DF, Brady MT, Levine GL, Jarvis WR. Pediatric Prevention Network nosocomial infection rates in US children's hospitals'