Medical News

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Infection Rates in the Neonatal and Pediatric Intensive Care Units of U.S. Children's Hospitals

Nosocomial infections and antimicrobial resistance are major causes of mortality and morbidity and have become a major public health focus. To date, most national and international nosocomial infection surveillance and prevention activities have been focused on adults, despite the fact that pediatric patients are at high risk for nosocomial infections because of their immature immune systems and prevalent device use. In 1997, the Hospital Infections Program at the Centers for Disease Control and Prevention 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 nosocomial infection surveillance methods used and neonatal intensive care unit (NICU) and pediatric intensive care unit (PICU) 1997 nosocomial infection rates. Data were collected on standardized forms and entered and analyzed using SPSS software for Windows (SPSS, Inc., Chicago, IL).

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

It was concluded that the number of months that NICU or PICU nosocomial infection surveillance was conducted varied among hospitals. Reported NICU and PICU nosocomial infection rates varied by hospital; some reported overall nosocomial infection rates, and others focused on one or more particular sites of infection (eg, bloodstream infection 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 nosocomial infection surveillance methods at children's hospitals so that valid inter-hospital nosocomial infection rate comparisons can be made.

FROM: Girouard S, Levine G, Goodrich K, et al. Pediatric Prevention Network: a multicenter collaboration to improve health care outcomes. *Am J Infect Control* 2001;29:158-161.

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