

Medical News

EDITED BY GINA PUGLIESE, RN, MS; MARTIN S. FAVERO, PhD

Pseudomonas Outbreak From Bath Toys

Nosocomial outbreaks of *Pseudomonas aeruginosa* in pediatric hospitals frequently involve neonates and immunosuppressed patients and can cause substantial morbidity and mortality. Buttery and colleagues recently reported a multidrug-resistant *P aeruginosa* outbreak in a pediatric oncology ward at the Royal Children's Hospital, Melbourne, Australia.

Eight patients had clinical illnesses including bacteremia (5), infections of skin (2), central venous catheter site (1), and urinary tract (1). The environmental ward survey yielded isolates of multiresistant *P aeruginosa* from a toy box containing water-retaining bath toys, as well as from three of these toys. Pulsed-field gel electrophoresis of bacterial DNA demonstrated identical band patterns of the isolates from patients, toys, and toy-box water. A case-control study involving the 8 cases and 24 disease-matched controls demonstrated a significant association between *P aeruginosa* infection and use of bath toys ($P=.004$), use of bubble bath ($P=.014$), duration of stay ($P=.007$), and previous antibiotic exposure ($P=.026$). Cultures from the bubble-bath liquid were negative.

This is the first report of a nosocomial outbreak associated with bath toys. The authors caution against the use of water-retaining bath toys in wards treating immunocompromised children.

FROM: Buttery JP, Alabaster SJ, Heine RG, Scott SM, Crutchfield RA, Garland SM. Multiresistant *Pseudomonas aeruginosa* outbreak in a pediatric oncology ward related to bath toys. *Pediatr Infect Dis J* 1998;17:509-513.

Eye Injuries From Chlorine-Disinfected Tonometer

Too often, household bleach is used to disinfect medical devices that are used on patients. Sodium hypochlorite solutions are good microbicides but they are incompatible with many medical devices, and, if not rinsed properly, the device may cause injury to exposed tissues. Maldonado, from the Department of Ophthalmology, Albacete General Hospital, Valencia, Spain, recently reported a study in which the disinfection procedure caused eye injuries, not because of direct exposure to chlorine, but due to exposure to chlorine-damaged instruments.

This study aimed to describe a previously unreported complication associated with the use of chlorine-disinfected applanation tonometer heads for intraocular pressure measurement after excimer laser photorefractive keratectomy. Two weeks apart, two patients underwent, respectively, a 7-diopter and a 4-diopter myopic excimer-laser correction in the first eye. Complete epithelial closure of the ablated area was observed by biomicroscopy in the first-week examination. Four weeks after photorefractive keratectomy, a complete ophthalmic examination was performed. Goldmann applanation tonometry was performed bilaterally after thoroughly rinsing and drying the tonometer biprism, which had been immersed regularly in a solution containing 5,000 ppm chlorine (a 1/10 dilution of household bleach). Slit-lamp examination and corneal topographic surface regularity were measured.

A few minutes after applanation tonometry, both patients reported ocular discomfort in the excimer laser-treated eyes, whereas the untreated fellow eyes were painless. Punctate corneal lesions

and superficial epithelial-cell clumping were present in the first patient's treated eye, predominantly in the inferior aspect of the applanated cornea. Visual inspection showed a normal tonometer tip. In the second patient's treated cornea, a focal epithelial defect was identified biomicroscopically, which corresponded to the steeper region within the ablation zone on the videokeratograph. In this case, crystal deposits were found on the tonometer tip. The epithelial alterations resolved without sequelae in both cases. It was concluded that disinfecting solutions of chlorine can cause crystal deposit formation on the tonometer head. Applanation tonometry after repeated disinfection with chlorine solutions appears to have the potential for disrupting the epithelial layer of the healing cornea. Covered contact tonometry or noncontact tonometry should be evaluated as alternative methods to chemically disinfected contact tonometry for intraocular pressure measurement after excimer laser surgery, especially during the first postoperative month.

FROM: Maldonado MJ. Corneal epithelial alterations resulting from use of chlorine-disinfected contact tonometer after myopic photorefractive keratectomy. *Ophthalmology* 1998;105:1546-1549.

Nursery Outbreak of *Stenotrophomonas maltophilia*

Investigators from the University Hospital Nijmegen, The Netherlands, recently reported an outbreak of *Stenotrophomonas maltophilia* among preterm infants in a neonatal intensive-care unit (NICU). Between March and May 1996, *S maltophilia* was isolated from endotracheal aspirate samples from five preterm infants in the NICU. Four infants were colonized superficially, and a fifth infant died due to *S maltophilia* septicemia. *S maltophilia* was isolated from tap water from three outlets in the NICU, including one with a previously unnoticed defective sink drain. Water from these outlets was used to wash the preterm infants. Environmental and clinical *S maltophilia* isolates yielded identical banding patterns on random arbitrary polymorphic DNA polymerase chain reaction analysis. The outbreak was controlled by reinforcement of hand washing, limitation of the use of tap water for hand washing, and by using sterile water to wash the preterm infants. The authors concluded that tap water should not be used for washing preterm infants in the NICU, unless steps are taken to prevent microbial growth in the outlets.

FROM: Verweij PE, Meis JF, Christmann V, Van der Bor M, Melchers WJ, Hilderink BG, et al. Nosocomial outbreak of colonization and infection with *Stenotrophomonas maltophilia* in preterm infants associated with contaminated tap water. *Epidemiol Infect* 1998;120:251-256.

Acquisition and Mortality of MRSA in ICU

Investigators from the Department of Surgery, University Hospital Rotterdam Dijkzigt, The Netherlands, conducted a point-prevalence survey to evaluate the risk of patients in intensive-care units (ICUs) becoming infected with methicillin-resistant *Staphylococcus aureus* (MRSA) and to assess the mortality during a 6-week follow-up period, compared with patients who

developed methicillin-sensitive *S aureus* (MSSA) infection. They surveyed 1,417 ICUs in 17 Western European countries. There were 10,038 patients in ICUs who were part of the European Prevalence of Infection in Intensive Care (EPIC) study. Prevalence of MRSA and MSSA ICU-acquired infections, risk factors, and mortality were determined.

On the study day, 21% of patients had ICU-acquired infections. The most commonly reported pathogen was *S aureus* (30%). Overall, 60% of *S aureus* strains were resistant to methicillin (with a wide intercountry variation). The most commonly reported MRSA infections were pneumonia and lower respiratory tract infections. The most important risk factor for MRSA was the length of stay in the ICU. MRSA infection reduced the chance of survival, particularly when it was found in lower respiratory tract infections. The risk of mortality was three times higher in patients with MRSA than in those with MSSA. The authors concluded that patients in ICU are at high risk of becoming infected with MRSA; the longer they stay, the higher the risk. Patients with MRSA infections are less likely to survive than those with MSSA.

FROM: Ibelings MM, Bruining HA. Methicillin-resistant *Staphylococcus aureus*: acquisition and risk of death in patients in the intensive care unit. *Eur J Surg* 1998;164:411-418.

Impact of Clindamycin Restriction on *Clostridium difficile*

Widespread antibiotic use has been associated with increases in both bacterial resistance and nosocomial infection. Climo and coinvestigators from Hunter Holmes McGuire Veterans' Hospital characterized the impact of hospitalwide clindamycin restriction on the incidence of *Clostridium difficile*-associated diarrhea (CDAD) and on antimicrobial prescribing practices.

An outbreak of CDAD was found to be caused by a clonal isolate of clindamycin-resistant *C difficile* and was associated with increased use of clindamycin. Hospitalwide requirement of approval by an infectious disease consultant of clindamycin use led to an overall reduction in clindamycin use, a sustained reduction in the mean number of cases of CDAD (11.5 cases/mo vs 3.33 cases/mo; $P < .001$), and an increase in clindamycin susceptibility among *C difficile* isolates (9% vs 61%; $P < .001$). A parallel increase was noted in the use of, and costs associated with, other antibiotics with antianaerobic activity, including cefotetan, ticarcillin-clavulanate, and imipenem-cilastin. The hospital realized overall cost savings as a result of the decreased incidence of CDAD.

Hospital formulary restriction of clindamycin was found to be an effective way to decrease CDAD. It also can lead to a return in clindamycin susceptibility among isolates and can effect cost savings to the hospital.

FROM: Climo MW, Israel DS, Wong ES, Williams D, Coudron P, Markowitz SM. Hospital-wide restriction of clindamycin: effect on the incidence of *Clostridium difficile*-associated diarrhea and cost. *Ann Intern Med* 1998;128:989-995.

Chart Reminders for Pneumococcal Vaccination

Researchers from the University of Oklahoma Health Science Center reported the results of a pharmacy-based program to increase pneumococcal vaccination rates using simple chart reminders. On a daily basis, inpatient records on general medicine and cardiology services at an academic medical center were reviewed to determine which patients were eligible to receive

pneumococcal vaccine. Eligible inpatients were interviewed, and the percentage of nonvaccinated inpatients given vaccine during hospitalization was determined. During an intervention period, reminders were placed on charts requesting a vaccine when indicated.

Of 447 inpatients, 224 (50.1%) had one or more indications for receiving pneumococcal vaccine but only 64 (28.6%) had been vaccinated previously. Of 224 vaccine-eligible patients, 158 (70.5%) had a prior hospitalization within the previous 5 years. Previous hospitalization was not significantly associated with receiving (48 [30.4%] of 158) or not receiving (16 [24.2%] of 66; $P = .35$) vaccine prior to admission. During the observational period, 0 of 80 vaccine-eligible, nonvaccinated inpatients were vaccinated before discharge. In comparison, 23 (29%) of 80 inpatients were vaccinated after a chart reminder ($P < .001$). During the intervention period, vaccination rates were 10-fold higher on general medicine services than on cardiology services.

The authors concluded that a hospital-based pharmacy vaccination program that relied on simple chart reminders was significantly associated with increased vaccination rates among inpatients at risk for invasive pneumococcal disease.

FROM: Vondracek TG, Pham TP, Huycke MM. A hospital-based pharmacy intervention program for pneumococcal vaccination. *Arch Intern Med* 1998;158:1543-1547.

Group B Streptococcal Necrotizing Fasciitis

Necrotizing fasciitis, a severe and uncommon infection involving the subcutaneous tissues, usually is caused by group A streptococci; group B streptococci (*Streptococcus agalactiae*) have been reported to cause necrotizing fasciitis in only four instances (two involving neonates) over the past 4 decades. Researchers from Sir Mortimer B. Davis-Jewish General Hospital and McGill University, Montreal, Quebec, Canada, reported three cases of group B streptococcal necrotizing fasciitis in adults in southern Ontario and Quebec within a 10-month period. All three patients had serious underlying illness, and all required surgical debridement in addition to antibiotic therapy. One of the cases fulfilled the criteria for streptococcal toxic shock-like syndrome. Group B streptococcus has been recognized as a frequent cause of serious disease in adults. It has become evident over the past decade that invasive streptococcal infections are on the increase. The authors suggest that group B streptococcus recently has acquired an increased ability to cause necrotizing fasciitis and suggest that this may represent the emergence of a new clinical syndrome in adults.

FROM: Gardam MA, Low DE, Saginur R, Miller MA. Group B streptococcal necrotizing fasciitis and streptococcal toxic shock-like syndrome in adults. *Arch Intern Med* 1998;158:1704-1708.

Biofilms in Hemodialysis Tubing

Man and coinvestigators conducted a study of biofilms associated with hemodialysis machines. Biofilms consist of microorganisms immobilized at a substratum surface embedded in an organic polymer matrix of bacterial origin. Tubing drawn from the fluid pathways within dialysis machines of various models were investigated for biofilm.

Scanning electron microscopy (SEM) performed on approximately 2-cm² samples of the tubing inner surfaces revealed that the inner surfaces of the tubing were covered with biofilms consisting of numerous deposits and glycocalyx at different stages of formation, with components containing bacteria and algae. Evaluations of biomass were performed from tubing sections of various lengths and inner diameters put in tubes containing water for injection and