

Hospital-Acquired Infections Among Hemodialysis Patients

The epidemiological characteristics of nosocomial infections among patients requiring chronic hemodialysis, a high-risk and rapidly growing population, have not been fully elucidated. D'Agata and coinvestigators conducted a 30-month cohort study and compared the rates of bloodstream infections, urinary tract infections (UTIs), pneumonia, and diarrhea caused by *Clostridium difficile* and the distribution of pathogens among hospitalized chronic hemodialysis patients to hospitalized patients not requiring chronic hemodialysis. To identify risk factors for developing a nosocomial infection among chronic hemodialysis patients, a matched case-control study was performed. A total of 1,557 nosocomial infections were detected during 1,317 (2%) of 68,361 admissions. Of these, 47 nosocomial infections occurred in chronic hemodialysis patients during 31 (5%) of 578 admissions.

Nosocomial infections were significantly more frequent among the chronic hemodialysis group (9.1/1,000 patient-days) compared with the non-chronic hemodialysis group (3.8/1,000 patient-days; relative risk [RR], 2.4; 95% confidence interval [CI₉₅], 1.8-3.2; $P < .001$). UTIs were the most common nosocomial infections among chronic hemodialysis patients, accounting for 47% of all infections in this population. UTIs were significantly more common among chronic hemodialysis patients (4.2/1,000 patient-days) compared with non-chronic hemodialysis patients (0.7/1,000 patient-days; RR, 6.2; CI₉₅, 3.8-9.5; $P < .001$). Among chronic hemodialysis patients, *Candida* species and enterococci were the most common pathogens in contrast to coagulase-negative staphylococci and *Staphylococcus aureus* among patients not requiring hemodialysis. Using conditional logistic regression, a greater index of comorbidity was significantly associated with nosocomial infections among the chronic hemodialysis population (odds ratio, 3.6; CI₉₅, 1.2-10.7; $P = .02$).

Chronic hemodialysis patients were found to be at a substantially greater risk for developing a nosocomial infection compared with other hospitalized patients.

FROM: D'Agata EM, Mount DB, Thayer V, Schaffner W. Hospital-acquired infections among chronic hemodialysis patients. *Am J Kidney Dis* 2000;35:1083-1088.

Outcomes of Elderly Patients With MRSA

Morrison L. Stolarek, from the Department of Geriatric Medicine, Eastern General Hospital, Edinburgh, reported a retrospective study of admissions to the geriatric acute assessment and rehabilitation ward over a 1-year period to identify those with methicillin-resistant *Staphylococcus aureus* (MRSA) and determine whether this affected outcomes. Of 204 patients, 238 admissions were analyzed, and 9.8% of patients were MRSA positive. Demographics did not differ between MRSA-positive and -negative patients. Respiratory co-morbidity was more com-

mon in MRSA-positive patients. Rates of functional decline did not differ between the two groups. Those colonized or infected by MRSA had a significantly longer stay (51.4 vs 32.2 days, $P = .03$), perhaps due to isolation and limited rehabilitation. The virulence of MRSA may be less in these patients, therefore isolation may be inappropriate and counterproductive

FROM: Stolarek ML. Does MRSA affect patient outcomes in the elderly? A retrospective pilot study. *J Hosp Infect* 2000;45:169-171.

Microbial Contamination and Connector Type

Needleless connectors (NCs), which allow direct access to intravascular catheters, are widely used in clinical practice. The benefits of these devices to healthcare workers are well documented; however, the potential risk of microbial contamination and associated infection is unclear. Seymou and coinvestigators, from Birmingham, United Kingdom, conducted a study to evaluate microbial contamination rates for an NC as compared to a conventional three-way tap, which was connected to the hubs of central venous catheters (CVCs) immediately following insertion. Patients in the study group had NCs attached to the three-way taps, whereas the control group had standard entry port caps. On removal (up to 72 hours), the connectors were studied for microbial contamination.

There was no significant difference between the number of three-way taps contaminated on the internal surface with microorganisms in the control group with entry port caps (19/132, 14%) compared to the group with NCs (18/105, 17%). Sixteen percent (27/173) of the NCs were contaminated with microorganisms on the internal surfaces. The external surface of 33% (27/82) of the NC silicone seals was contaminated after clinical use. Microorganisms were also isolated from 9% (8/91) of the silicone seals after disinfection. The use of this needleless connector compared to standard caps therefore does not appear to increase the risk of infection via the internal lumen of three-way taps.

FROM: Seymou VM, Dhallu TS, Mos HA, Tebb SE, Elliot TS. A prospective clinical study to investigate the microbial contamination of a needleless connector. *J Hosp Infect* 2000;45:165-168.

Hydrogel- and Silver Salt-Coated Urinary Catheters and Incidence of UTI

Catheters coated with hydrogel and silver salts have been proposed to prevent hospital-acquired urinary tract infections (UTIs). Thibon and colleagues, from Service d'Hygiene Hospitaliere, CHU de Caen, France, carried out a randomized, prospective, double-blinded, multicenter trial to compare those catheters with classical urinary tract catheters. They included in the study 199 patients requiring urethral catheterization for more than 3 days: 109 in

group 1 (classical catheter) and 90 in group 2 (catheter coated with hydrogel and silver salts). Urine from the patients was tested for 10 days after the insertion of the catheter (reactive dipsticks each day and diagnostic urinalysis every 2 days). The UTI associated with catheterization was defined on the basis of bacterial and cytological criteria (>100,000 colony-forming units bacteria/mL and >10 leucocytes per mm³).

Twenty-two UTIs were recorded: 13 in group 1 and 9 in group 2. The cumulative incidence of UTI associated with catheterization was 11.1% overall: 11.9% for group 1 and 10% for group 2; the odds ratio was 0.82 (95% confidence interval, 0.30-2.20); the cumulative incidence for UTI, calculated by the Kaplan-Meier method, was 36.3 overall: 35.2 in group 1 and 36.0 in group 2; the overall incidence density was 19 per 1,000 days of catheterization: 21 in group 1 and 18 in group 2. The differences between the two groups were not significant.

The authors pointed out that there is not enough evidence to conclude that catheters coated with silver salts and hydrogel give greater protection than classical catheters and to recommend widespread use.

FROM: Thibon P, Le Coutour X, Leroyer R, Fabry J. Randomized multi-centre trial of the effects of a catheter coated with hydrogel and silver salts on the incidence of hospital-acquired urinary tract infections. *J Hosp Infect* 2000;45:117-124.

Studies on the Disinfection of VRE-Contaminated Surfaces

The incidence of vancomycin-resistant enterococci (VRE) as a nosocomial pathogen has been steadily increasing, and the role of environmental surfaces in the transmission of VRE is incompletely defined. At the recent Association of Practitioners in Infection Control meeting, Rutala, Weber, and Gergen, from the University of North Carolina (UNC) School of Medicine and UNC Hospitals, Chapel Hill, reported a study designed to assess the efficacy of a quaternary ammonium compound (quat) to eliminate VRE from environmental surfaces and to assess the transfer of VRE from environmental surfaces via gloved hands.

Test surfaces were inoculated with a VRE suspension (~100 bacteria/sq in). Cleaning methods tested included wiping the inoculated surface with a dry cloth, a cloth immersed in sterile saline, a cloth sprayed with a quat, and a cloth immersed in a quat (drying time 1 minute). Transfer experiments were performed by inoculating a surface as above. The surface was then touched with sterile gloved hands, and, following this contact, the fingertips were pressed onto a blood agar culture plate. Assays were performed using Rodac plates.

Reductions in VRE for dry cloth, saline treated cloth, quat-sprayed cloth, and quat-immersed cloth were 71.2%, 99.5%, 95.4%, and 98.1%, respectively. The results were similar for both test surfaces (overbed table, Formica) for both VRE and vancomycin-sensitive enterococci. For transfer experiments, the mean colony count of the inoculated sur-

face (overbed table, Formica, linoleum, metal) was 79 VRE/Rodac with 0 VRE transferred.

The authors concluded that all cleaning and disinfecting procedures using a moistened cloth are highly effective in removing or inactivating VRE from contaminated surfaces. They observed no difference in elimination of a vancomycin-susceptible and a vancomycin-resistant strain of *Enterococcus*. Transfer of VRE from a contaminated surface via gloved hands was poor, with a transfer efficiency of less than 1%. These data suggest that currently used disinfection processes likely are highly effective in eliminating VRE. However, surface disinfection must involve contact with all contaminated surfaces. Given the low efficiency of transmission via gloved hands, low-level environmental contamination is not likely to play a major role in VRE transmission for patients on contact isolation.

FROM: Rutala WA, Weber DJ, Gergen MF. Vancomycin-resistant *Enterococcus* sp (VRE): surface disinfection and transmissibility via contaminated surfaces. Presented at the Association for Professionals in Infection Control and Epidemiology, Inc, 27th Annual Conference and International Meeting; June 18-22, 2000; Minneapolis, MN. Abstract.

Effect of Temperature and Soil on Ortho-phthalaldehyde Solution

In the healthcare setting, high-level disinfectants (HLDs) such as those containing glutaraldehyde are used routinely to prevent the transmission of infections by contaminated medical devices. Ortho-phthalaldehyde, an aromatic dialdehyde, has emerged as an alternative HLD to glutaraldehyde.

Chan-Myers and Roberts from Advanced Sterilization Products, Irvine, California, conducted studies to evaluate the effect of temperature and organic soil (horse serum) concentration on the biocidal activity of ortho-phthalaldehyde solution. The normal use concentration of ortho-phthalaldehyde is 0.55% with an exposure time of 12 minutes at 20°C. Using the suspension test and membrane filtration methodology, 0.3% ortho-phthalaldehyde solution was tested against *Bacillus subtilis* spores (American Type Culture Collection 19659, Rockville, MD) at 20°C, 25°C, 30°C, and 35°C. The same solution with 5%, 20%, and 40% added horse serum was evaluated against *Staphylococcus aureus* and *Pseudomonas aeruginosa* at 20°C. At predetermined time exposures, aliquots were sampled from the test solutions (contaminated with 10⁶ cells or spores), neutralized, and processed.

The results showed that the level of biocidal activity was directly related to the study temperature. A 5-log reduction was observed in 3 hours at 35°C as compared with 24 hours at 20°C. For *S aureus* and *P aeruginosa*, with an exposure time of 5 minutes or below, a decrease in biocidal activity was observed with increasing horse serum concentration, but there was no difference in efficacy when the exposure time was 10 minutes or longer.

The authors concluded that an increase in organic