

# Journal Watch

*Journal Watch presents a brief description of articles recently published in other journals and thought to be of relevance or interest to the AIC readership. Readers are encouraged to refer to the full article for complete information.*

## Fluoroquinolones and the risk for MRSA acquisition

Fluoroquinolones are a common class of antimicrobial drug prescribed in hospital and community settings. There is preliminary evidence suggesting fluoroquinolones may predispose patients to infection or colonisation with methicillin resistant *S. aureus* (MRSA). Weber *et al.* conducted a dual case-control study to determine whether exposure to fluoroquinolones is a risk factor for subsequent isolation of *S. aureus* and if the effect is different for MRSA versus methicillin susceptible *S. aureus* (MSSA). Further, the study explored differences in risk between levofloxacin and ciprofloxacin.

The cases consisted of one group of 222 patients with hospital acquired MRSA and one group of 163 patients with hospital acquired MSSA. The control group consisted of 343 randomly selected patients admitted during the study period. Using multiple logistic regression, the researchers adjusted for days at risk for infection and each of the other patient risk factors.

Exposure to both levofloxacin (OR 5.4;  $p < 0.0001$ ) and ciprofloxacin (OR 2.2;  $p < 0.003$ ) was associated with isolation of MRSA but not MSSA. Following adjustment for multiple variables, both drugs remained risk factors for MRSA but not MSSA. The authors acknowledge that there was substantial variability between cases and control groups with respect to a number of variables including coexisting illnesses, days spent in intensive care units and presence of intravascular catheters.

The authors concluded that exposure to levofloxacin or ciprofloxacin is a significant risk factor for the isolation of MRSA, but not MSSA.

Weber S, Gold H, Hooper D, Karchmer A & Carmeli Y. Fluoroquinolones and the risk for methicillin resistant Staphylococcus aureus in hospitalised patients. *Emerging Infectious Diseases* 2003; 9(11):1415-1429.

## Sources of Aspergillus in the hospital environment

A number of recent studies have suggested that, besides air, hospital water is a potential source of transmission of filamentous fungi. A study recently reported in the *Journal of Clinical Microbiology* investigated the possible source of transmission of *Aspergillus fumigatus* within a hospital in Norway.

The investigators carried out a prospective survey of environmental isolates of *A. fumigatus* over an 18-month period to establish whether waterborne fungi play a role in nosocomial aspergillosis. Molecular typing was performed on isolates from 15 patients with proven or possible invasive aspergillosis, and from water (n=54) and air (n=21).

The results of genomic analysis suggested that patients with invasive aspergillosis can be infected by strains originating from water or from air. In addition, isolates derived from either air or water tended to cluster together in the genomic analysis. These findings may have implications for infection control measures and the investigation of outbreaks of aspergillosis amongst immune compromised patients.

Warris A, Klaassen CHW, Meis JFGM, de Ruiter MT, de Valk HA, Abrahamsen TG, Gaustad P & Verweij PE. Molecular epidemiology of *Aspergillus fumigatus* isolates recovered from water, air and patients shows two cluster of genetically distinct strains. *Journal of Clinical Microbiology* 2003; 41(9):4101-4106.

## Pseudomonas surgical site infections linked to a healthcare worker with onychomycosis

*Pseudomonas aeruginosa* infections in cardiac surgical chest wounds are unusual and have been previously associated with contamination of chest tube suction pumps and to the onychomycotic nail of a cardiac scrub nurse.

Mermel and co-workers report an outbreak and subsequent investigation of *P. aeruginosa* surgical site infections among cardiac surgical patients in a university teaching hospital. From 1999 to 2000 there were no cases of *P. aeruginosa* surgical site infections; however, from January to August 2001, there

site infections; however, from January to August 2001, there were five cases identified, three in surgical chest wounds and two in the thigh saphenous vein harvest site.

Healthcare workers involved in two or more cases were interviewed and had their fingernails scraped for culture specimens. Environmental swabs were collected from the operating rooms (ORs) and cardiac surgical equipment. Heating, ventilation and air conditioning (HVAC) records were reviewed.

Five healthcare workers working in the OR were involved in at least two cases of *P. aeruginosa*. One, a cardiac surgeon, was involved in every case. The surgeon stated he did not routinely double glove and was noted to have advanced onychomycosis of the thumbnail. *P. aeruginosa* was isolated from under the nail. Only three patient isolates were available for molecular typing by pulsed field gel electrophoresis, two were identical to the surgeon's strain. A number of other infection control issues were also noted during the investigation.

Following treatment of the surgeon and resolution of the HVAC and OR equipment problems, *P. aeruginosa* surgical site infections abated.

The authors conclude that at least two cases of the cluster resulted from colonisation of a surgeon's onychomycotic nail. Additionally, the outbreak may have been contributed to by breaches in standard OR procedures.

Mermel L, McKay M, Dempsey J & Parenteau S. *Pseudomonas* surgical site infections linked to a healthcare worker with onychomycosis. *Infection Control & Hospital Epidemiology* 2003; 24(10):749-752.

### Activity of disinfectants against spores of *Clostridium difficile*

This laboratory-based study examined the effectiveness of three commonly used, environmentally safe disinfectants (2% glutaraldehyde, 0.26% peracetic acid and 70% isopropanol) and acidified nitrite for killing spores of *Clostridium difficile* in the hospital environment.

Four strains of *C. difficile* belonging to different serogroups were tested using a dilution-neutralization European standard method. For peracetic acid and acidified nitrite, the subjective cleaning effect and the sporicidal activity was also tested in the presence of organic load. Tests were performed with disinfectant exposure times of 5, 15 and 30 minutes.

The results showed that peracetic acid was highly sporicidal, yielding a minimum 4 log<sub>10</sub> reduction of germinating spores

independent of organic load conditions. Isopropanol showed low or no inactivation at all exposure times, whereas glutaraldehyde and acidified nitrite each resulted in an increasing inactivation effect over time. Soiling conditions did not influence the effect of acidified nitrite. There was no difference in sporicidal activity among the four strains tested for any of the investigated agents.

Wullt M, Odenholt I & Walder M. Activity of three disinfectant and acidified nitrite against *Clostridium difficile* spores. *Infection Control & Hospital Epidemiology* 2003; 24:765-768.

### Economic impact of rotavirus infection

The aim of this prospective study was to determine the extra length of stay and the average cost for rotavirus healthcare-associated infection (HAI). Children admitted to the paediatric ward of the Reims University Hospital between the 1 December 2001 and 31 March 2002 were included in a pairwise matched (1:1) case-control study. Cases were defined as patients with rotavirus HAI. Controls were selected according to matching variables in a stepwise fashion. The costs measured in this study included all expenses sustained by the hospital. Information on costs was obtained from medical records and the hospital economic department.



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The attack rate and the incidence of healthcare-associated acquired rotavirus infection were 6.6% and 15.8 per 1000 hospital days, respectively, during a winter outbreak. Fifteen percent of HAI were identified after discharge. The average cost per case was 1930 and the mean excess length of stay was 4.9 days. The authors state that their findings clearly demonstrate the substantial expense incurred as a result of HAI caused by rotavirus in children. The authors then suggest that to prevent these costly infections, several cost-effective measures such as standard precautions should be reinforced in the education of the healthcare workers.

*Piednoir E, Bessaci K, Bureau-Chalot F, Sabouraud P, Brodard V, Andréoletti L & Bajolet O. Economic impact of healthcare-associated rotavirus infection in a paediatric hospital. Journal of Hospital Infection 2003; 55(3):190-195*

### Contamination of nebulizers

There is circumstantial evidence that nebulizer equipment may be a source of *Stenotrophomonas maltophilia* for patients with cystic fibrosis. In this study, 89 inpatient nebulizers were examined for evidence of *S. maltophilia* contamination of

which nine (10%) yielded 14 strains of the bacterium. Environmental samples were obtained from 73 different sites on the ward, of which 17 (23%) yielded a further 21 strains. Positive sites included taps, sink drains and potable water. Genotyping using ERIC-PCR and pulsed-field gel electrophoresis revealed that two pairs of patients' nebulizers were contaminated with closely related strains. None of the *S. maltophilia* isolates obtained from the ward environment shared genotypes with those obtained from the nebulizers.

The frequency of isolation of *S. maltophilia* from potable water sources on the ward suggests that contamination may result from using it to clean reusable nebulizer equipment, particularly if this is followed by inadequate drying. Although the actual source of *S. maltophilia* contamination of hospital-use nebulizer equipment in this study remained elusive, these results have important infection control implications.

*Denton M, Rajgopal A, Mooney L, Qureshi A, Kerr KG, Keer V, Pollard K, Peckham DG & Conway SP. Stenotrophomonas maltophilia contamination of nebulizers used to deliver aerosolized therapy to inpatients with cystic fibrosis. Journal of Hospital Infection 2003; 55(3):180-183*

### Emergence of MRSA in correctional facilities

A recent MMWR report has highlighted the spread of methicillin-resistant *S. aureus* (MRSA) into settings other than hospitals and nursing homes. MRSA has emerged recently as a more frequent cause of skin and soft tissue infections in the community, particularly in correctional facilities such as prisons, jails and detention centres. The report summarises several recent investigations of MRSA transmission among inmates of correctional facilities in three States of America.

Inadequate personal hygiene, barriers to medical care, and other factors contributed to transmission. Access to soap was limited or restricted for security reasons, and alcohol-based hand rubs were difficult to introduce because of misuse of these products. Mental health and behaviour problems among inmates also probably contributed to poor adherence and hindered efforts to improve hygiene. Problems with the laundering processes were also identified.

Proper access to medical care was hindered by the requirement for co-payments for acute care visits, and by inadequate resources for wound care. In addition, high medical staff turnover presented a challenge to providing education on infection control procedures.

*CDC. Methicillin-resistant Staphylococcus aureus infections in correctional facilities – Georgia, California and Texas, 2001-2003. MMWR 2003; 52(41):992-996.*

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