

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.

Bioterrorism related inhalational anthrax

This paper describes the epidemiological and clinical features and outcomes of the 10 cases of inhalational anthrax in the USA in the latter months of 2001. The 10 cases (seven male) had a median age of 56 years and came from Washington DC, Florida, New Jersey and New York. Seven of the patients were postal workers and two worked in a media company. All of these were considered likely to have contracted their illness as a result of exposure to contaminated mail. The route of exposure for the tenth case is not known.

In cases where it was identifiable, the median incubation period was 4 days. All 10 presented with fevers or chills and fatigue or malaise. Nine presented with a cough, nine with nausea or vomiting, eight with shortness of breath and seven with sweats. All 10 had abnormal chest x-rays: eight had pleural effusions, seven had infiltrates and seven had mediastinal widening. The organism was identified readily by blood culture or immunohistological testing of pleural fluid or transbronchial biopsy specimens.

The survival rate of 60 per cent was higher than for the previous 18 cases reported in the USA in the 20th century or the cases reported following the industrial accident in Verdlovsk, former Soviet Union. The improved survival is attributed to awareness, combination antibiotic therapy and improved intensive care management.

Jernigan JA, Stephens DS, Ashford DA et al. Bioterrorism related inhalational anthrax: the first 10 cases reported in the United States. Emerg Infect Dis 2001; 7:933-44.

HIV seroconversion in a health care worker

Hawkins *et al.* report seroconversion to HIV in a health care worker following an occupational exposure to blood, despite use of combination post-exposure prophylaxis (PEP). The incident involved a penetrating needlestick injury to the web space between the left thumb and index finger. The injury occurred during clean up of materials used for blood collection. The recipient was double gloved.

The source was known to be HIV positive, experiencing treatment failure and resistant to some or all of the components of the standard PEP regimen. In response, a modified PEP combination consisting of drugs from all three classes of antiretroviral agents was commenced 95 minutes post-exposure. The health care worker completed courses of

D4T and zidovudine but discontinued DDI after 8 days due to side effects.

Baseline serology indicated that the recipient was HIV-1 and HIV-2 antibody negative at the time of injury. Although therapy was optimised based on information on the source virus, the health care worker was found to be HIV-1 antibody positive at 3 months post-exposure. Subsequent molecular typing demonstrated an epidemiological link between the source and recipient virus isolates.

Hawkins DA, Asboe D, Barlow K & Evans B. Seroconversion to HIV-1 following a needlestick injury despite combination post-exposure prophylaxis. J Infect 2001; 43:12-18.

Emergence of glycopeptide resistant *Staphylococcus aureus* in Australia

This article is the first published case in Australia of treatment failure due to glycopeptide resistance in methicillin-resistant *Staphylococcus aureus* (MRSA). The case involved a hospitalised 41 year old male with bilateral lower limb ischaemia due to Type 1 diabetes (with multiple complicating factors).

The patient required below knee amputations and the sites subsequently became infected with MRSA. The patient developed a rash following administration of vancomycin, and treatment was changed to teicoplanin, in addition to gentamicin and metronidazole. The wounds were unresponsive to nearly 2.5 months of glycopeptide therapy and further amputation was required.

However, when teicoplanin was ceased and linezolid commenced, the patient's condition improved rapidly. The *S. aureus* isolate, hVISA, had a minimum inhibitory concentration to vancomycin of >4mg/L. This report of the failure of glycopeptides to treat MRSA infection heralds the beginning of a new era of antibiotic resistance in Australia.

Ward PB, Johnson PDR, Grabsch EA, Mayall BC & Grayson ML. Treatment failure due to methicillin-resistant Staphylococcus aureus (MRSA) with reduced susceptibility to vancomycin. Med J Aust 2001; 175:480-483.

Economic evaluation in infection control

As health care related expenditure continues to rise, decision makers are increasingly relying on both clinical effectiveness

and economic efficiency when making health care decisions. This article by Saint *et al.* is the first in a series of articles on methodological concepts and deals with the issue of economic evaluation in infection control. The authors describe the strengths and weaknesses of the various types of economic evaluation – cost minimisation, cost effectiveness, cost utility and cost-benefit analysis.

The ways in which effectiveness and costs may be measured are described, with emphasis placed on choosing the correct perspective for the assessment of costs. Application of these methods to the field of infection control is discussed. Additionally, the important features of two specific methods used for economic evaluation – decision analytic modelling and economic evaluation alongside a clinical trial – are outlined, and the criteria by which published economic analyses should be judged are provided.

Saint S, Chenoweth C & Fendrick AM. *The role of economic evaluation in infection control.* *Am J Infect Control* 2001; 29:338-344.

Contamination of fomites with VRE

This paper by Zachary *et al.* describes the contamination rate of gowns, gloves and stethoscopes with vancomycin-resistant Enterococci (VRE) during routine patient examination, which highlights the importance of fomites in the transfer of resistant organisms. Examinations of 49 patients colonised or infected with VRE were studied over a 2 year period. The examiner's glove fingertips, gown (both front and cuffs) and stethoscope diaphragm were sampled immediately after the examination by pressing onto the surface of selective agar plates.

VRE were isolated from at least one site in 33 (67 per cent) of 49 cases. Gloves were found to be contaminated in 63 per cent of samples, gowns in 37 per cent and stethoscopes in 31 per cent. All three items were found to be positive in 24 per cent of cases.

Each stethoscope diaphragm was sampled again after cleaning with an alcohol wipe, and VRE were isolated from only 1 of the 49 cases after cleaning. Contamination was found to be more likely if the patient had a colostomy or ileostomy. There was no difference in the contamination rate for colonised patients identified by rectal cultures compared to those with infection.

Zachary KC, Bayne PS, Morrison VJ et al. *Contamination of gowns, gloves, and stethoscopes with vancomycin-resistant Enterococci.* *Infect Control Hosp Epidemiol* 2001; 22:560-564.

Antimicrobial-impregnated catheters: the risk of bacterial resistance

Sampath *et al.* compared the efficacy of a new antiseptic catheter coated with silver sulfadiazine and chlorhexidine on the external surface and chlorhexidine in the lumens to a catheter impregnated with minocycline and rifampin on its external and luminal surfaces.

Antimicrobial spectrum of activity was tested by determining zones of inhibition against a range of organisms. Resistance to luminal colonisation was tested by both an *in vitro* model using *Staphylococcus epidermidis* or *Staphylococcus aureus*, and an *in vivo* rat subcutaneous implant model using sensitive or antibiotic-resistant bacteria.

The results showed that both types of catheter exhibited broad-spectrum antibacterial action, but the antibiotic-impregnated catheter was not effective against *Candida* species and *Pseudomonas aeruginosa*. Both catheters were shown to resist colonisation with *S. aureus* after 21 days post-implant in the rat model and after 7 days of continuous perfusion in the *in vitro* model.

Repeated *in vitro* exposure of *S. epidermidis* culture to the antibiotic and antiseptic combinations led to small increases in the minimum inhibitory concentration (15 times and 2 times, respectively). Antiseptic catheters were found to be more effective than antibiotic catheters in preventing colonisation by rifampin-resistant *S. epidermidis* *in vivo*.

The authors conclude that both antiseptic and antibiotic impregnated catheters exhibit similar efficacy. However, when challenged with a rifampin-resistant strain, the antibiotic catheter appeared to be more susceptible to colonisation than the antiseptic-coated device.

Sampath LA, Tambe SM & Modak SM. *In vitro and in vivo efficacy of catheters impregnated with antiseptics or antibiotics: evaluation of the risk of bacterial resistance to the antimicrobials in the catheters.* *Infect Control Hosp Epidemiol* 2001; 22:640-646.

Infection control considerations during construction activities

This review by Cheng & Streifel provides guidance for hospitals planning to undertake construction and renovation activities. The review focuses on the risk of aspergillosis associated with these activities, and provides some guidelines for infection control practitioners to consider when addressing the risks to patients. The authors consider that the risks of aspergillosis are somewhat different when considering demolition and land excavation as opposed to construction within an existing facility.

This article outlines the key factors to consider: risk assessment of patients, procedures and environment; air quality; routes of entry and egress; soil management; conducting inspections; contingency planning; housekeeping; and lines of communication. The authors also stress the need for infection control teams to be involved in the planning process from the beginning.

Infection control practitioners should find this article a useful checklist when faced with major construction and redevelopment work at their facility.

Cheng SM & Streifel AJ. *Infection control considerations during construction activities: land excavation and demolition.* *Am J Infect Control* 2001; 29:321-328.