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.


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 nevirapine 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.


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.


Economic evaluation in infection control

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


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.