

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.

Hepatitis C Virus outbreak in a haematology/oncology clinic

Hepatitis C Virus (HCV) is a leading cause of chronic liver disease and has been implicated in health care associated infection due to infection control breaches.

In September, 2002, the Nebraska Health and Human Services were advised of a cluster of HCV genotype 3a infections in patients who attended an outpatient Haematology/Oncology Clinic. Genotype 3a is reported in the United States in less than 8% of all HCV infections. Using Nebraska's blood-borne virus registries, the authors identified a patient who enrolled at the clinic in March, 2000 with pre-existing HCV genotype 3a infection. Initial interviews with the clinic staff revealed that a nurse was dismissed in July, 2001 due to breaches of infection control.

Clinic records identified all patients who visited the clinic from March, 2000 to December, 2001. All living patients were contacted and offered HCV testing. Each patient's medical history, including evidence of pre-existing hepatitis, previous hepatitis diagnosis and HCV risk factors was examined. In total, 99 patients developed HCV infection, all having visited the clinic on the same day as a patient that was HCV infected, and all having saline flushes on those days. Of the patients that received a saline flush, 71% developed HCV infection ($P < 0.001$). The first 10 HCV cases all visited the clinic on the same day as the source patient and all received saline flushes. There was an attack rate of 27% and genotype 3a was identified in 96% of cases.

Investigation revealed that patients had reported to the hospital's infection control committee in February, 2001 that a nurse in the clinic re-used syringes used to withdraw blood from an intravenous catheter. The Committee referred the complaints to the privately owned clinic's Oncologist. Infection control breaches, including shared saline bags and reuse of syringes, were identified by outside reviewers in April, 2001. The breaches were never reported to the health authorities.

According to the authors, the context of reuse of syringes and the sharing of saline bags supports the hypothesis of patient-to-patient transmission, although health care worker to patient transmission could not be discounted, as the health care workers implicated did not submit to testing.

Contamination of intravenous solutions related to reuse of syringes has previously been implicated in outbreaks including HCV. Infection control recommendations stipulate that sterile, disposable needles and syringes must be used for every injection. If multi-use vials cannot be avoided, they should be restricted to use in a centralised medication area. Needles must not be re-used to access vials.

These findings emphasise the need for maintenance of infection control programs in outpatient settings, prompt correction of unsafe practices and reporting of infection control breaches.

Oliveira, A., White, K., Leschinsky, D., Beecham, B., Vogt, T, Moolenaar, R., Perz, J. & Safranek, T An outbreak of Hepatitis C Virus Infection among Outpatients at a Haematology/Oncology Clinic. Annals of Internal Medicine 2005; 142 (11): 898-902.

Staphylococcus Aureus colonisation and the risk of infection in ICU

Staphylococcus aureus (*S.aureus*) is the most frequent cause of bacteraemia and ventilator associated pneumonia (VAP) in intensive care units. The aim of this study was to evaluate the relationship between *S.aureus* nasal and tracheal colonisation and infection in medical intensive care unit (MICU) patients.

A prospective, observational cohort study of patients admitted to a 17 bed MICU in New York City was conducted from February to June, 2002. All MICU patients were screened for *S.aureus* nasal colonisation. Tracheal specimens from intubated patients were collected; patients with a *S.aureus* clinical isolate detected within the previous 2 weeks were excluded. Patients were monitored for *S.aureus* during their MICU admission and for 30 days post discharge (or until death or hospital discharge). Of the 325 patients admitted to the MICU in the study period, 208 were enrolled in the study. Forty-seven (23%) patients had *S.aureus* nasal colonisation detected. Nasal colonisation was present in 42 patients on admission; 14 were colonised with MRSA and 33 MSSA.

Of the patients with nasal colonisation, 24% subsequently acquired an infection (5 developed bacteraemia and 6 pneumonia) with a RR 12.9 and incidence of 1.76/100 bed days, compared with 2% (0.12/100bed days) of non-nasal colonised patients. Most of the colonised patients with clinical infections had infecting strains that matched their colonising strains (82%). Half (53%) of the nasally colonised patients had *S.aureus* detected

in at least one tracheal aspirate, compared to 4.9% of non colonised patients.

Although limited by the investigators not being blinded to the colonisation status of the patients and the questionable criteria used for determining VAP, the authors found that nasally colonised patients had a higher rate of *S.aureus* infection. Further, that most patients were colonised on admission to the unit and developed infections with strains identical to their colonising strain. The rate of tracheal colonisation was significantly higher for patients who were nasally colonised.

Keene, A., Vavagiakis, P., Lee, M., Finnerty, K., Nicolls, D., Cespedes, C., Quagliarello, B., Chiasson, M., Chong, D. & Lowry, F. *Staphylococcus Aureus Colonisation and the Risk of Infection in Critically Ill Patients*. ICHE 2005; 26 (7): 622-628.

Considering risks to healthcare workers from glutaraldehyde alternatives in high-level disinfection

This article reports an exploratory two-part study that involved a survey of current practices relating to high level disinfectant (HLD) use in hospitals in British Columbia, Canada and a review of the toxicity data of chemicals used for HLD. This is the first study to examine issues specifically related to HLD and decision making.

Two products marketed as safer alternatives to glutaraldehyde are Cidex OPA (ortho-phthalaldehyde solution) and Compliance (hydrogen peroxide and peracetic acid) were examined. As there was limited chemical toxicity data available on these agents, the authors used a qualitative structure-activity relationship (SAR) analysis to predict relative respiratory sensitisation potential. The findings were confirmed by using another program that assesses chemicals for asthma hazards.

Sixty-four of 95 facilities responded to a questionnaire on current practices. Fifty-one (80%) of these used HLD. Of these 51 facilities, 49% were using glutaraldehyde alone and the remainder were using alternatives. OPA was the most frequently used glutaraldehyde alternative. In general, when deciding to use an alternative to glutaraldehyde the department involved consulted with occupational health, infection control and regional health authorities. Information given by sales representatives was commonly used. Concerns over staff health was the most common reason for introducing substitutes, and technical issues such as damage to instruments, staining and lack of apparent benefit were the most common reasons for not changing.

The findings on potential health effects associated with each chemical confirmed that glutaraldehyde is a typical respiratory sensitizer, and that OPA is very similar to glutaraldehyde, whilst hydrogen peroxide and peracetic acid are highly unlikely to do

so. The authors conclude that even though hydrogen peroxide and peracetic acid may be the safest choice in terms of respiratory sensitisation, they are still corrosive and highly irritating to the skin, eyes, mucous membrane and respiratory tract. Even though OPA appears to have both respiratory and dermal sensitising potential, the active ingredient concentration in currently available formulations is much lower than that in glutaraldehyde solutions.

The authors acknowledge that although the qualitative SAR analysis has limitations, it may still be useful for those needing to make decisions about the relative safety of HLD alternatives.

K. Rideout; K. Teschke; H. Dimich-Ward; S.M. Kennedy. *Considering risks to healthcare workers from glutaraldehyde alternatives in high-level disinfection*. Journal of Hospital Infection, 2005, 59, pp 4-11.

Infection control and quality health care in the new millenium

Health care associated infection (HCAI), as the author of this article emphasis, is one of the greatest challenges of modern medicine. In the United States alone, HCAI including nosocomial infections, are responsible for 44,000 to 98,000 deaths annually, which represents a financial cost of \$17 to \$29 billion. In the United Kingdom HCAI costs around one billion pounds and contribute to at least 5,000 deaths per year. Pittet states that consideration should be given to HCAI whether acquired during home, ambulatory, institutional or hospital care.

The article gives a brief historical background to models for infection prevention dating back to Semmelweis and Nightingale, which showed that these prevention programs could be successful and remain the guide for practitioners of today. In the early 1960's, surveillance became the foundation of infection control programs in the United States. Pittet reinforces that professionals should not lose sight of the primary purpose of surveillance which is to measure the outcome of interest related to health care associated infection, then design and promote interventions targeted at the reduction of infection.

The author discusses today's challenges for the infection control professional which includes antimicrobial resistance, antimicrobial control, emerging pathogens, xenotransplantation, prion disease and the development of evidence based recommendations just to mention a few. Other factors that are touched upon are the cost effectiveness of infection control and related programs, education, patient safety and trends in health care.

Pittet, D. *Infection Control and Quality Health Care in the New Millenium.*, Am J Infect Control. 2005 Jun;33(5):258-67