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.

Universal patient disinfection to control vancomycin-resistant Enterococci (VRE) in intensive care

The authors of this interesting article have taken a novel approach to the control of antibiotic-resistant organism in an intensive care environment by focusing on routine patient cleansing as a form of source control. They conducted a prospective sequential-group clinical trial on a total of 1787 patients admitted over the period October 2002 – December 2003, comparing three different methods of daily bathing or cleansing – Period 1: soap and water basin baths (483 patients), Period 2: cleansing with disposable cloths saturated with 2% chlorhexidine gluconate (642 patients) and Period 3: disposable cloth cleansing without chlorhexidine (662 patients). The outcome measures used were colonisation of patients' skin by vancomycin-resistant enterococci (VRE), healthcare worker hand or environmental surface contamination by VRE and patient acquisition of VRE rectal colonisation.

Over the study duration there were 86 patients identified with VRE colonisation – 34 in Period 1, 34 in Period 2 and 18 in Period 3. The number of patients with skin colonisation and the mean VRE colony counts from skin cultures were found to be significantly lower in the chlorhexidine period than in the other two periods. Similarly, there was a decreased frequency of healthcare worker hand contamination and environmental contamination with VRE during the chlorhexidine period. The incidence of VRE acquisition decreased from 26 colonisations per 1000 patient-days in the soap and water period to 9 per 1000 patient-days in the chlorhexidine period (RR 0.4; 95% CI, 0.1-0.9).

The authors suggest that the favourable results seen during the period of use of disposable chlorhexidine cloths for universal patient cleansing resulted from the decreased unit-wide contamination by VRE, lowering the colonisation pressure. They found that the chlorhexidine cloths were well tolerated by patients, and they detected no increase in chlorhexidine-resistant organisms. The study did not include a cost-benefit analysis of the intervention, and there were no details of clinical infections with VRE during the study period. Nevertheless, this study shows that source control interventions can be a useful adjunct to a comprehensive infection prevention strategy.

Vernon M, Hayden M, Trick W, Hayes R, Blom D & Weinstein R. Chlorhexidine gluconate to cleanse patients in a medical intensive care unit. Arch Intern Med 2006; 166:306-312.

A review of evidence for the prevention and control of MRSA

This article presents the findings of a systematic review of evidence published between 1996-2004 that examined interventions to prevent and control the transmission of MRSA in healthcare settings. The review focused on the role of screening patients for MRSA, use of surveillance, isolation and cohorting of patients, topical decolonisation of patients, environmental cleaning and cost analyses.

Most studies were found to be observational and many contained methodological flaws. Although evidence for isolation of patients to control MRSA transmission was weak, some studies did provide evidence of reduction in MRSA rates due to isolation and cohorting of patients with MRSA. While screening was included as an additional intervention in several studies, it was not a primary intervention and could not be assessed separately. One study suggested that regular feedback of surveillance data to staff may reduce MRSA acquisition, possibly due to the positive effect of the feedback on staff behaviour. Although there was insufficient evidence to support the use of systemic or topical antimicrobial therapy, the authors found evidence that selective, short-term use of mupirocin for specific patient groups, prior to surgery or treatment, may be useful. Enhanced environmental cleaning with increased cleaning hours and use of a cleaning audit tool were found to be important in reducing MRSA transmission, although this tripled the cleaning costs. There was a lack of evidence on economic benefits of MRSA infection prevention and control strategies generally, although cost analyses in specialised areas such as intensive care units did demonstrate cost reductions.

In conclusion, the authors found evidence of association rather than cause and effect for infection control practices designed to reduce MRSA transmission. Nevertheless, they were able to identify strategies that the evidence suggested should be considered by policy makers and guideline developers. These strategies include the use of active surveillance cultures to identify high risk patients colonised or infected with MRSA in certain clinical specialties; isolation or cohorting of patients with MRSA; short-term use of topical decolonisation strategies in certain patient populations; effective environmental cleaning; and targeted combinations of the above.

Loveday H, Pellowe C, Jones S & Pratt R.. A systematic review of the evidence for interventions for the prevention and control of methicillin-resistant Staphylococcus aureus *(1996-2004): report to the Joint MRSA Working Party (Subgroup A). J Hosp Infect 2006; 63S:S45-S70.*

Surgical fires and alcohol skin disinfectants

A recent paper in the *ANZ Journal of Surgery* has 'fuelled' the debate on the risk of surgical fires from the use of alcohol-based skin antiseptics in operating theatres. Spigelman & Swan conducted a literature review and an audit of 10 operating theatres in the Hunter Area Health Service, concluding that the use of such solutions presented a risk of fire, and that discontinuation of their use should be considered, amongst other things, as part of a strategy to reduce this risk.

A letter by Maiwald appeared in a later issue presenting a counter argument, balancing the risk and associated costs of surgical site infection against the tiny real risk of surgical fire that might arise as a consequence of the use of alcohol-based preparations followed by electrosurgery. As Maiwald points out, this usually results from inadvertent misuse, such as pooling and wetting of drapes, followed by rapid use of electrosurgery before the substances have dried. Readers are encouraged to refer to both publications to follow the debate in more detail.

Spigelman A & Swan J. Skin antiseptics and the risk of operating theatre fires. ANZ J Surg 2005; 75:556-558.

Maiwald M, Farmer C, Lance D, Nieuwenhuijs V, Heath C, Watson D & Gordon D. Surgical antisepsis and the risk of operating theatre fires – letter. ANZ J Surg 2006; 76:422-3.

Isolation room availability and its impact on infection transmission

This article details a prospective 12 month observational study of two large hospitals (total 1100 beds) in the UK that was undertaken to assess why patients could not be placed in isolation despite infection control advice. As a part of the study, the reason for the isolation recommendation was also recorded.

During data collection, if it was evident that isolation was required but not achieved (i.e. 'failure to isolate'), the duration of the failure was recorded and the reasons given by the nursing staff for this failure were ascertained. Data on the incidence of new methicillin-resistant *Staphylococcus aureus* (MRSA) isolates per ward were collected, and these were correlated with rates of isolation failures for MRSA cases. In addition, point prevalence surveys were conducted to determine the single room occupation.

Results showed that MRSA (48%) and *Clostridium difficile* (26%) were the two most frequent reasons given for the recommendation to isolate. The two most common reasons given for the failure to isolate were single rooms being occupied with other patients isolated for infection control reasons and the ward/department having no single rooms. Other, less common reasons were male/female bed availability, patient reasons (i.e. safety) and single rooms

occupied with patients for other reasons (i.e. terminal/disruptive). The mean duration of failure to isolate was 4 days.

Although the study revealed that 17% of all beds were in single rooms, the pattern of availability throughout the hospitals was variable, with some areas having no single rooms, whilst others had as many as 14. During the period under study, there were 845 infection control recommendations for isolation, of which 185 (22%) were considered as failures to isolate. Further analysis of these data in terms of pathogen and clinical specialty are given.

Finally, there was a statistically significant correlation between the number of failures to isolate for MRSA and the number of new MRSA isolates, although the actual MRSA data are not presented in the body of the article.

The authors conclude that a failure to isolate occurs frequently; this potentially exposes other patients to significant organisms and compromises infection control efforts. They advise that either isolation room capacity is increased that or an evidence based risk assessment is used in times where demand for isolation exceeds single room availability.

Interestingly, they found that the great majority of single rooms were being occupied for reasons other than infection control. Infection control practitioners could use the data reported in this article to support protocols for isolation of patients with significant organisms such as MRSA and *C. difficile*, and as a guide when assessing the number and use of isolation rooms within their individual facility.

Wigglesworth N & Wilcox M. Prospective evaluation of hospital isolation room capacity. J Hosp Infect 2006; 63:156-161.

Bacterial counts under finger rings

The aim of this study was to measure the effect of retaining or removing finger rings on surface bacterial counts on the hands before and after scrubbing and at the end of operative procedures. The authors recruited 32 theatre staff and obtained complete data on 28; all but one were right handed. Subjects scrubbed with chlorhexidine gluconate (0.5%).

A total of 18 samples were taken from each subject, including the ring itself, the skin underneath the ring, the adjacent skin and a similar area of skin on the other hand. These sites were sampled prior to the first scrub of the day, immediately following the scrub and at the end of the operative procedure. In a second set of sampling, the same areas were swabbed, with the ring removed prior to scrubbing and during the operative period.

The samples were plated onto horse blood agar plates which had been pre-incubated at 37°C for 24 hours to prove sterility. The plates were incubated after inoculation for 18 hours at 37°C. The colonies were then counted and classified.

The majority of bacteria isolated were identified as coagulase-negative Staphylococci. Before scrubbing, the bacterial count on the skin under the ring was significantly higher than on the control finger, the ring itself or the skin adjacent to the ring ($p=0.05$). Colony counts at all sites were significantly reduced by scrubbing ($p=0.05$). After the operative procedure, the colony counts on the skin under the retained rings were significantly higher than on the control finger ($p=0.01$). Two of the rings were silver and were associated with lower colony counts, but the numbers were too small to reach significance.

The authors suggest that it is preferable for operating room staff to remove rings before performing surgical procedures. They also found that rings reduced the effectiveness of scrubbing and increased glove micro-tears around the base of the finger.

Kelsall N, Griggs R, Bowker K & Bannister G. Should finger rings be removed prior to scrubbing for theatre? J Hosp Infect 2006; 62:450-452.