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.

Pandemic influenza: what infection control professionals should know

Three types of influenza viruses have been identified: Types A, B and C. Only A and B cause human disease, and only type A causes pandemics. Influenza A viruses are characterised by two surface antigens, haemagglutinin (H) and neuraminidase (N), of which there are sixteen H subtypes and nine N subtypes. Only viruses of the H5 and H7 subtypes are known to cause the highly pathogenic form of influenza.

H5N1 (avian influenza) was first identified over 100 years ago in Italy. Until 1997 the risk of avian influenza was considered to be very small in humans. However, in 2003 an outbreak of a highly pathogenic form spread among millions of birds in Asia. It is currently circulating widely in birds, both wild and domestic, has spread to an unprecedented geographic extent and has been transmitted from birds to humans. The World Health Organization (WHO), which only reports laboratory confirmed cases, has reported at least 228 human cases including 130 deaths (57%).

Two of the three necessary conditions for a pandemic have so far been met. First, a strain of influenza to which humans have little immunity has re-emerged and second, the strain can jump between species. The only remaining condition is that the virus mutates to a form that is easily transmitted between humans.

Important facts are: H5N1 is a strain with pandemic potential, and influenza pandemics are a recurring event. It is considered to be the most likely virus to start the next pandemic. Every country is likely to be affected and the virus could spread around the world within three months. It is projected that a substantial proportion of the world's population will require some form of medical care and that few countries will have the resources to cope with the large numbers of people who suddenly become ill. Vaccine development has the best potential to alleviate the effects.

Goldrick BA & Goetz AM. Pandemic influenza: what infection control professionals should know. AJIC 2007;35(1):7-13.

Validation of surgical site infection surveillance through mandatory single day visits

The Netherlands NNIS-based surveillance program (known as PREZIES) has been in operation since 1996 and collects data from 64 of the 98 hospitals in the Netherlands, including data on 143,321 procedures and 4,625 surgical site infections (SSIs). The authors state that most published validation studies of surveillance are carried out in only one institution and concentrate on validation of outcomes but not process. They also state that to their knowledge they are the only group performing continuous validation, which consists of a one-day visit to each hospital every three years. Both process and outcome are examined. The authors point out the importance of ongoing validation and of including process evaluation, particularly where there is regular staff turnover.

Process is evaluated through a structured interview discussing items including: which procedure groups are included and why; methods for including patients in the surveillance; and whether selection criteria are used; whether data collection responsibilities are documented; how SSIs are detected; feedback and application of results; use of internal validation; post-discharge surveillance; data completeness.

Outcome is evaluated by examining medical records for the twenty patients most recently included in the surveillance, regardless of SSI status, and the five most recently included patients reported as having an SSI. The judgement of the validation team (one member from the PREZIES team and one ICP from a previously validated hospital) is considered the 'gold standard'.

Forty hospital visits over five years yielded a positive predictive value of 97% and a negative predictive value of 99%. Validation of process resulted in advice being given to hospitals about many aspects of surveillance and an increase in the use of internal validation methods has been observed, contributing to the accuracy of the data.

Manniën J, van der Zeeuw AE, Wille JC & van den Hof S. Validation of surgical site infection surveillance in the Netherlands. ICHE 2007;28(1):36-41.

RCT for a regime for eradication of MRSA colonisation in hospitalised patients using a standard definition of persistent carriage

Decolonisation of patients with methicillin-resistant *Staphylococcus aureus* (MRSA) has been shown to reduce the risk of *Staph. aureus* infection in some studies but not in others. The role of decolonisation remains controversial, largely because no agents have been found to be effective for long-term eradication in hospitalised patients. A recent Cochrane review concluded that there is insufficient evidence to support use of topical or systemic agents for eradicating MRSA.

This study evaluated a combination of topical and systemic agents for eradication of MRSA colonisation in patients with culture of the organism from >= 1 body site on two occasions within a two-week period and who had no evidence of infection based on standard definitions. A total of 146 patients were included in the study, 111 randomised to receive therapy for seven days and 35 to receive no treatment. At three months of follow-up 74% of treated patients had negative culture results compared to 32% of untreated patients (p=0.0001). The difference remained significant at eight months,

with 54% of those treated still culture negative for MRSA. Mupirocin resistance emerged in 5% of follow-up isolates.

Simor AE, Phillips E, McGeer A, Konvalinka A, Loeb M, Devlin R & Kiss A. Randomized controlled trial of clorhexidine gluconate for washing, intranasal mupirocin, and rifampicin and doxyclcline versus no treatment for the eradication of methicillin-resistant staphylococcus aureus *colonization.*

Eradication or decolonisation of methicillin resistant Staphylococcus aureus carriage: What are we doing and why are we doing it? – editorial comment

In the US and more recently in Canada, rates of health care associated MRSA infections have continued to increase despite intensive infection control efforts. 'Search and destroy' policies have been recommended in some parts of the world with the aim to ultimately eradicate the pathogen from health care facilities. However, evaluation of the efficacy of infection control strategies is difficult and there have been few that have been planned in advance, like the randomised clinical trial (RCT) described above.

There are many issues surrounding the carriage of MRSA; carriage may be transient, intermittent or persistent, and present at more than one site. The anterior nares have been thought to be the most frequent site of carriage, but nasal colonisation is not universal among MRSA positive patients, and the rectum may be an important reservoir for those with community-acquired MRSA. These observations have obvious consequences if the goal of an intervention is to eradicate MRSA carriage. Firstly, surveillance must involve more than one site, and the most effective treatment may be a combination of topical and systemic antibiotics. However, there are obvious problems associated with the use of systemic antibiotics including development of antibiotic resistance and adverse drug reactions. The study described above was not designed to examine the effects, if any, on MRSA infection rates. Ultimately the success or failure will be judged by the ability to prevent MRSA infection. There are many more questions to be answered.

Bradley SF. Eradication or decolonization of methicillin-resistant Staphlycoccus aureus *carriage: What are we doing and why are we doing it? CID 2007;44(15 Jan):186-188.*

How many infection control staff do we need in hospitals?

During a one-day workshop in the Netherlands a group of infection control professionals and medical microbiologists debated the question: 'How many infection control staff do we need in hospitals? Many countries apply the standard of one infection control practitioner (ICP) per 250 hospital beds in accordance with the results of the SENIC study, and it is arguable that health care has changed significantly since this study was carried out in the 1970s. Obvious changes include shorter hospital stays and many patients being treated as outpatients or day cases. Hospital inpatients are generally more sick than they were thirty years ago and a higher proportion of patients are immunosuppressed.

A more recent standard has been published by the Nosocomial and Occupational Infections Section of Health Canada, recommending three full-time equivalent (FTE) ICPs per 500 beds in acute care hospitals. The workshop in the Netherlands involved experienced ICPs and medical microbiologists and agreed on a standard of one FTE ICP per 178 hospital beds and one FTE medical microbiologist per 806 beds. They agreed that the new standard should use the number of admissions as the denominator – this is equivalent to one FTE ICP per 5,000 admissions and one medical microbiologist per 2,5000 admissions. The authors believe that the fact that their estimates are close to that reached by the Canadian group and that they represent a simple correction for the changes in health care in the last thirty years suggests the estimates are realistic, and recommendations for their adoption have been made to the appropriate bodies.

Van den Broek PJ, Kluytmans JAJW, Ummels LC, Voss A & Vandenbroucke-Grauls CMJE. How many infection control staff do we need in hospitals? J Hosp Inf 2007:65:108-11.

Why are health care workers not vaccinated against influenza?

The reasons for the generally poor compliance of health care workers (HCW) with influenza vaccination are not well understood. Compliance remains low in spite of the facts that influenza vaccination is safe and effective and HCWs are a potential source of transmission to patients in their care. This study in Brazil surveyed 376 HCWs after they had taken part in an educational program on influenza prevention.

The overall compliance rate was 34.4%. Multivariate analysis showed that factors associated with vaccination where older age, believing that most of their colleagues had been vaccinated and having cared for patients with severe influenza. The main reason given for being vaccinated was"individual protection"and to a lesser extent"protection for patients". In subsequent years the compliance rate fell to 20.2% when the education program was not run but the questionnaire was given; and to 12.75% when no education was scheduled.

The study revealed a lack of knowledge among HCWs as to the effectiveness, recommended use, adverse effects and composition of the vaccine. The association of vaccination with older age is proposed to be due to the greater appeal of the vaccination campaigns aimed at older people and/or the greater professional experience and scientific knowledge of older health professionals. Importantly, only 8% of employees reported that they had suffered serious adverse effects from previous vaccinations; a strong reason for avoidance of future vaccination. The authors conclude that any degree of intervention and education is better than none, and that the study demonstrates the need for ongoing education campaigns.

Attitudes of health care workers to influenza vaccination: why are they not vaccinated? J Hosp Inf 2007:35(1);56-61.