

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.

Norovirus outbreak in a long-term care facility

This study describes a gastroenteritis outbreak due to norovirus in a 500-bed long-term care facility during October 2002 in Melbourne, Victoria, and the methods used to contain the outbreak. Three wards on separate floors or blocks notified infection control of acute gastroenteritis among patients and staff. The outbreak took 32 days to control and 52 patients and 14 staff were affected. Norovirus genotype 2 was detected by PCR for one patient each in Ward A and Ward B, no further testing for norovirus was conducted. It was unclear who the index case was and no common food source was identified.

Measures implemented to control the outbreak included: suspension of patient transfers between wards and to other institutions; wards were closed to new admissions; patients were cohorted (except on one ward); hand hygiene was promoted and alcohol hand rubs were available at each bedside. Hypochlorite solution, gowns and gloves were used for cleaning, visitors were restricted and exposed foods such as fruit were discarded. Staff did not rotate between wards.

Control of the outbreak focused on strict attention to hand hygiene. Staff were provided with education on transmission of gastroenteritis and on cleaning, disinfection and patient isolation protocols. All affected staff were advised not to return to work until 48 hours after resolution of their symptoms.

The authors concluded that due to long term excretion of the virus, the re-classification of staff and patients to the non-infectious state 48hrs after symptoms resolve may not be sufficient to prevent further transmission of the virus. Although the authors discussed various methods to control the outbreak, the application of contact and droplet precautions or the appropriate donning and removal of PPE in this outbreak were not mentioned.

Cooper E, Harris A & Blamey S. A norovirus gastroenteritis epidemic in a long term care facility. *Infect Control Hosp Epidemiol* 2005; 26(3):256-258

Impact of a norovirus outbreak on hospital resources

Noroviruses have frequently been implicated in outbreaks of gastroenteritis in nursing homes and hospitals. Transmission of infection usually occurs via consumption of contaminated food and drink, person to person spread or, indirectly, via

contaminated surfaces. Airborne transmission via aerosolisation of vomitus particles is suspected.

Following notification of patients with diarrhoea on two medical wards in a 960-bed tertiary care hospital, Zingg *et al* conducted a case-control study to calculate the overall impact on hospital resources. The median number of bed occupancy days, expenses due to increased workload, lost productivity, additional microbiological tests, cost of the infection control team and loss of revenue were calculated.

Affected patients were isolated until 2 days after diarrhoea ceased. Admissions to the ward and transfers out were suspended and rooms were disinfected following patient discharge. Hand hygiene was reinforced and affected staff were sent home until 2 days after cessation of symptoms. The outbreak lasted for 17 days. These measures did not prevent new cases although the incidence decreased.

In total, 16 patients and 29 healthcare workers were affected during the outbreak. The attack rate among patients was 13.9% (16 of 115 exposed) and amongst staff 29.5% (26 of 88 exposed). There was a significant reduction in bed occupancy and increased cost for diagnostics. Infected patients required significantly more nursing care compared to controls, calculated at \$625 per case or \$10,300 for the outbreak. The authors identified a loss of \$37,968 in revenue due to bed closures. The overall financial cost of the outbreak was calculated at \$40,675.

Zingg W, Colombo C, Jucker T, Bossart W & Ruef C. Impact of an outbreak of norovirus infection on hospital resources. *ICHE* 2005;26(3):263-267

Method of hand drying and bacterial removal

The objective of this study was to evaluate the use of a warm air drier with and without ultraviolet light compared to paper towel in removing bacteria from washed hands. The study used 15 volunteers who were healthy women with no skin lesions, who undertook each method. Volunteers performed a 15 second handwash with soap and water, followed by a 15 second rinse. The warm air drier was set at a temperature of 60 degrees plus or minus 2 degrees C, and used with or without the addition of ultraviolet light. Hands were either held stationary under the drier or rubbed together. The paper towels were sterilised before use and a total of three sheets were used each time.

Bacterial cultures of the hands were performed using contact agar plates, and total colony forming units per cm² were calculated. When hands were dried using the warm air, samples for culture were collected before drying, after 15 seconds and again 15 seconds later. When hands were dried with paper towels, samples were collected before drying, after using the first towel then again after each sheet was used. Areas of the hand that were sampled included the palms, fingers and fingertips.

Findings of this study showed that numerous bacteria remained on the surface of the hands after washing with non antimicrobial soap. When hands were held stationary after using the warm hand drier, there were fewer bacteria compared to rubbing the hands during drying. There were also fewer bacteria recovered after 30 seconds of drying compared to without ultraviolet light.

The authors concluded that warm air drying with hands held stationary under ultraviolet light was the most effective method. They also found that paper towel was effective for removing bacteria from the fingertips.

Yamamoto Y, Ugai K and Tasahashi Y. Efficiency of hand drying for removing bacteria from washed hands: Comparison of paper towel drying with warm air drying. Infect Control Hosp Epidemiol 2005;26:316-320

Influenza vaccination rates in staff caring for paediatric patients

Improving influenza immunisation rates among healthcare workers caring for high-risk paediatric patients should be a high priority. In this study, the authors surveyed a large number of hospitals to assess the results of a pilot multicentre influenza education campaign. The campaign provided free educational materials, including influenza fact sheets, colour posters and a powerpoint presentation to improve the low immunisation rates of 15-20% among healthcare workers (HCW) caring for high-risk paediatric populations. A letter was also sent to hospital administrators urging their support for achieving HCW influenza immunisation rates of 50% or greater.

Infection control staff at 19 (59%) of 32 hospitals in the US and Canada returned the completed questionnaires describing their influenza immunisation campaigns. Most common strategies in the campaigns included educational materials, mobile carts and vaccine deputies. The authors noted that specific strategies to enhance availability and convenience, such as use of mobile carts, vaccine deputies, or distribution of vaccine during evening or weekend hours were not associated with higher immunisation rates in hospital-wide immunisation campaigns.

The survey results found HCW influenza immunisation rates ranging from 12% to 63% (median, 43%). The study demonstrated that high levels of influenza immunisation can be achieved when HCWs are motivated to protect their patients,

appropriate education is provided, and access to vaccine is facilitated.

Bryant K, Stover B, Cain L et al. Improving influenza immunisation rates among healthcare workers caring for high-risk pediatric patients. Infect Control Hosp Epidemiol 2004;25(11):912-917

Case-control study design

The case-control study is the most frequently chosen study design used to identify risk factors for infection with antibiotic-resistant organisms. Two articles by the same group of authors in the April issue of Infection Control and Hospital Epidemiology deal with this topic and are worth reading in detail.

The first article outlines the issue of control group misclassification bias that can arise when some of the patients in a randomly selected control group have not had clinical cultures performed and, thus, may be undetected case-patients. This would be expected to lead to an underestimation of the 'true' odds ratio for infection with antibiotic resistant organisms.

The second article outlines a suggested study design that would minimise this bias, which the authors call a case-case-control study design, which uses two separate case-control analyses within a single study. The first analysis compares patients infected with resistant bacteria (resistant cases) with control patients without infection caused by the target organism, and the second analysis compares patients infected with the susceptible phenotype (susceptible cases) with the same group of control patients without infection.

Comparison of the separate multi-variable risk models generated by the two analyses enables identification of the risk factors specifically associated with isolation of the resistant phenotype. The authors argue that this study design overcomes some of the limitations of the traditional case-control study design.

Harris A, Carmeli Y, Samore M, Kaye K & Perencevich E. Impact of severity of illness bias and control group misclassification bias in case-control studies of antimicrobial-resistant organisms. Infect Control Hosp Epidemiol 2005; 26:342-345

Kaye K, Harris A, Samore M, Carmeli Y. The case-case-control study design: addressing the limitations of risk factor studies for antimicrobial resistance. Infect Control Hosp Epidemiol 2005;26:346-351