

Understanding gastroenteritis in elderly residents of aged-care facilities

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Early identification of outbreaks allows carers and public health agencies to reduce the burden of this disease

Recently, serious outbreaks of foodborne gastroenteritis occurring in aged-care facilities (ACFs) have captured public and media attention. Gastroenteritis will occur in settings where people gather, even when standards of care and food hygiene are very high. Some infections are inevitable due to the susceptibility of the population and the highly infectious and persistent nature of enteric pathogens. Early recognition of an outbreak and identification of the responsible organism enable interventions that can reduce the impact of disease.

While gastroenteritis normally has a mild clinical course, hospitalisation and death as a result of gastroenteritis are more common among elderly people, particularly those who live in ACFs.¹ The relative contribution of gastroenteritis to deaths among elderly residents of ACFs is difficult to establish. Death certificates rarely record this common condition as a contributing cause, and many residents have severe underlying illnesses that are more directly related to their death. In May 2007, the deaths of five elderly residents of a Victorian ACF were referred to the state coroner for investigation as to whether an outbreak of *Salmonella* Typhimurium 44 was related to their deaths. Recently, similarly serious outbreaks of *Salmonella* Typhimurium 135 and *Clostridium perfringens* have occurred among ACF residents in South Australia and New South Wales, respectively.

Reassuringly, the incidence of gastroenteritis in elderly people is considerably lower than the incidence in younger people.² Each year in Australia, an estimated 17.2 million cases of gastroenteritis (0.9 episodes per person per year) affect all age groups.² While most episodes are mild, more severe cases result in an estimated 3.4 million visits to general practitioners annually.² People over the age of 65 years who live in the community have the lowest incidence of gastroenteritis of any age group, and are five times less likely to experience gastroenteritis than children aged 0–4 years.² A recent study of residents of six Australian ACFs found that the incidence of gastroenteritis was about 0.1 episodes per resident per year, making it less common than respiratory infections, urinary tract infections, and skin and soft tissue infections (Judy Forrest, Managing Director, Bug Control (Aust) Pty Ltd, personal communication). These findings are consistent with surveillance of nosocomial infections in long-term care settings internationally.³

When it does occur in ACFs, gastroenteritis commonly manifests as outbreaks in which two or more residents, along with facility staff, may be affected. In Australia, recorded outbreaks in ACFs comprise about 50% of all outbreaks of gastroenteritis (Katie Fullerton, Coordinating Epidemiologist, OzFoodNet, personal communication). A single case of gastroenteritis in an elderly resident of an ACF may signal the beginning of an outbreak, making it important for clinicians to have a low threshold for testing faecal specimens. Although testing to identify specific causes rarely benefits the individual patient, early recognition of the pathogen can guide public health investigations and infection control measures in the facility to minimise the spread and

consequences of a potential outbreak. The spread of gastroenteritis in ACFs may be from person to person, foodborne, or a combination of both. The identification of some pathogens may require specialised laboratory testing, so it is important that clinicians seek advice from a laboratory microbiologist on optimal specimen collection procedures and appropriate tests. Once a diagnosis is made in two epidemiologically linked cases, further diagnostic testing is rarely required.

If a foodborne pathogen such as *Salmonella*, *C. perfringens*, or shiga toxin-producing *Escherichia coli* is isolated from the faeces of an elderly resident of an ACF, there is an urgent need for public health authorities to search for other related cases and investigate food sources. If norovirus is identified, the focus should be on strict and heightened infection control within the facility.

Norovirus is a challenge to control.⁴ The global spread of novel strains of the virus resulted in many gastroenteritis outbreaks in Australia in 2006 and 2007.^{5,6} More outbreaks than normal were observed in a wide range of settings, particularly ACFs, hospitals and childcare centres. Norovirus is highly infectious⁷ and difficult to control, even when intensive infection control measures are implemented.⁴ Outbreaks of infection with the virus cause major difficulties not only for the aged-care sector, but also for acute health care, tourism and the international cruise ship industries.^{4,8}

Each year, Australian health departments issue advice to ACFs regarding prevention of common infections, such as gastrointestinal and respiratory infections, in addition to the numerous state and territory and national guidelines for the sector. Australia has a robust system of aged care, including provision of a safe food supply. Of the reported gastroenteritis outbreaks in these facilities, only a small number are the result of contaminated food.⁹

As of 5 October 2008, a new national food standard (Standard 3.3.1) requires organisations that prepare food for vulnerable populations (including elderly people) to implement risk-based food safety plans (<http://www.foodstandards.gov.au/the-code>). These changes need to be incorporated into state and territory food laws in order to take effect.

The proportion of Australia's population that may be considered elderly will dramatically increase in coming decades, resulting in more people requiring the services of ACFs.¹⁰ It is clear that gastroenteritis is an important issue for elderly people and ACF managers. To minimise the risk to residents, facility managers and clinicians need to be aware that organisms causing gastroenteritis often result in outbreaks and that faecal specimens of ill residents should be tested. Early identification of outbreaks allows carers and public health agencies to reduce the burden of this disease.

Competing interests

Martyn Kirk is a recipient of a National Health and Medical Research Council Scholarship. Since 2001, he has been employed by the Australian Government Department of Health and Ageing to conduct research into foodborne diseases under the OzFoodNet program.

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References

- 1 Frenzen PD. Mortality due to gastroenteritis of unknown etiology in the United States. *J Infect Dis* 2003; 187: 441-452.
- 2 Hall GV, Kirk MD, Ashbolt R, et al. Frequency of infectious gastrointestinal illness in Australia, 2002: regional, seasonal and demographic variation. *Epidemiol Infect* 2006; 134: 111-118.
- 3 Stevenson KB, Moore J, Colwell H, Sleeper B. Standardized infection surveillance in long-term care: interfacility comparisons from a regional cohort of facilities. *Infect Control Hosp Epidemiol* 2005; 26: 231-238.
- 4 Dolin R. Noroviruses — challenges to control. *N Engl J Med* 2007; 357: 1072-1073.
- 5 Tu ET, Bull RA, Greening GE, et al. Epidemics of gastroenteritis during 2006 were associated with the spread of norovirus GII.4 variants 2006a and 2006b. *Clin Infect Dis* 2008; 46: 413-420.
- 6 Centers for Disease Control and Prevention. Norovirus activity — United States, 2006–2007. *MMWR Morb Mortal Wkly Rep* 2007; 56: 842-846.
- 7 Teunis PF, Moe CL, Liu P, et al. Norwalk virus: how infectious is it? *J Med Virol* 2008; 80: 1468-1476.
- 8 Verhoef L, Depoortere E, Boxman I, et al; Food Borne Viruses in Europe Network. Emergence of new norovirus variants on spring cruise ships and prediction of winter epidemics. *Emerg Infect Dis* 2008; 14: 238-243.
- 9 OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet Network, 2006. *Commun Dis Intell* 2007; 31: 345-365.
- 10 Richmond RL. The changing face of the Australian population: growth in centenarians. *Med J Aust* 2008; 188: 720-723. □