Gastroenteritis outbreaks in institutions

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Outbreaks of gastroenteritis, characterised by diarrhoea, vomiting and/or abdominal cramps in two or more people, often occur in semi-closed settings such as hospitals and aged-care facilities. Several characteristics common to institutional settings facilitate outbreaks of gastroenteritis: close human contact and communal living; shared bathroom facilities; movement of ill staff and patients between wards/facilities; a higher proportion of susceptible people (because of their age or underlying illness); centralised food preparation/handling; and often impaired continence of inhabitants.

Epidemiology

In New South Wales (NSW) outbreaks of gastroenteritis in residential or educational institutions, child-care or healthcare facilities are notifiable under the NSW *Public Health Act 1991*. In 2008 there were 575 outbreaks and almost 9600 people affected by gastroenteritis in institutions in NSW.[1] The number of outbreaks varies each year, largely influenced by the epidemiology of noroviruses which are known or suspected to cause the vast majority of these outbreaks.[2] Consequently, the seasonal pattern of outbreaks follows that of norovirus, with the incidence of outbreaks increasing in autumn, peaking in winter and declining over spring and summer.

Causative agents

Several bacterial, viral and parasitic agents are responsible for gastroenteritis outbreaks in institutions. Foodborne outbreaks of gastroenteritis are less frequent and may reflect mandatory safe food handling and hygiene practices. However, outbreaks do occur, and the most common foodborne pathogens in Australia include *Salmonella* spp., norovirus and *Clostridium perfringens*.[2,3]

The majority of institutional outbreaks of gastroenteritis are spread through person-to-person contact and are caused by viruses including norovirus, rotavirus and adenoviruses. Recently, transmission of the bacterium *Clostridium difficile* has been responsible for a large number of outbreaks in institutions worldwide, associated with person-to-person spread of a new epidemic strain in the Northern hemisphere.[4]

Norovirus

Human noroviruses are small round viruses that belong to the Caliciviridae family of viruses. They are a major cause of large gastroenteritis outbreaks in settings where there is close human contact.

Noroviruses can infect people of all ages and cause symptoms including severe vomiting, diarrhoea, abdominal cramps and general malaise. Symptoms usually develop 24–48 hours after being exposed to the virus. The illness is self-limiting, resolving in 12–72 hours. Currently, there is no specific treatment for norovirus gastroenteritis and there is no vaccine to prevent infection.

Several characteristics of norovirus are believed to contribute to its outbreak potential: they are highly contagious (as few as 10 virus particles can cause infection); transmission can occur through the ingestion of contaminated food and water, by person-to-person spread, and also by airborne spread of aerosolised vomitus; the virus is shed for prolonged periods even after symptoms have ceased; asymptomatic carriers could propagate an outbreak; the virus is very resistant to environmental conditions; and the viral genome is continually evolving.[5]

Clostridium perfringens

Clostridium perfringens is a spore-forming anaerobic bacterium that is ubiquitous in soil and in the intestines of humans and many animals. *C. perfringens* strains expressing the enterotoxin (CPE) type A are a common cause of foodborne outbreaks of gastroenteritis.[6] Spores of *C. perfringens* are capable of withstanding cooking temperatures and if the food is allowed to cool slowly the spores germinate. Foodborne outbreaks of CPE gastroenteritis can occur when large quantities of food, especially meat-based dishes, are prepared in advance and kept warm for several hours before serving.[7]

After the consumption of contaminated food enterotoxin is released in the small intestine. Symptoms usually begin 6–24 hours after ingestion and may include intense abdominal cramps and watery diarrhoea. The illness is short lived and is completely resolved within 24 hours in most people, although it can be prolonged in the elderly. There is no specific treatment for CPE gastroenteritis and the best

method of avoiding outbreaks of CPE gastroenteritis is safe food handling.

Public health control measures

The immediate control of outbreaks of gastroenteritis in an institution is important to prevent the spread of infection to other residents, staff and visitors. In 2005, a toolkit titled 'Gastro Pack' was developed that provides information on the early recognition of an outbreak, implementation of control measures, management of affected people and communication strategies.[8] The Department of Health and Ageing have released a similar resource titled 'Gastro Info Kit', designed specifically for outbreaks in aged-care facilities.[9] Use of these guidelines should aid in the containment of gastroenteritis outbreaks in institutions.

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Genital *Chlamydia trachomatis* infection

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Chlamydia is a notifiable condition in New South Wales (NSW) under the *Public Health Act 1991*. There were 14 947 laboratory-confirmed cases notified in 2009. Known as the 'silent disease', it is the most reported sexually transmissible infection (STI) in Australia, the United States, the United Kingdom and Canada. Due to the mainly asymptomatic nature of chlamydia, chronic infection and re-infection are common,[3] highlighting the importance of screening.[4] People aged less than 25 years have the highest rates of infection.

Chlamydia trachomatis is one of three species of *Chlamydiae* that commonly cause disease in humans. It is responsible for ano-genital and conjunctival (conjunctivitis and trachoma) infections. Infant conjunctivitis and pneumonia can result from maternal genital infection.[1] *C. trachomatis* serovars D–K are responsible for most sexually-acquired genital infections. Serovar L_2 causes a severe proctolitis or genital ulcer lymphadenopathy syndrome known as lymphogranuloma venereum which is beginning to re-appear in Australia among men who have sex with men.[2]

Symptoms

Most infected people are asymptomatic (70% of women and 90% of men). Symptoms that may occur during acute infections include urethral discharge and discomfort on urination (dysuria). Men may also develop painful swollen testes (epididymitis). Women occasionally report dysuria or bleeding between periods. Deep pain during sexual intercourse and lower abdominal pain in women suggest pelvic inflammatory disease from ascending infection. Pelvic inflammatory disease increases the risk of subsequent