

Listeriosis surveillance in Australia

Alexis Zander^A, Craig Shadbolt^B
and Martyn D. Kirk^C

^ANSW Public Health Officer Training Program,
NSW Ministry of Health

^BFood Incident Response and Complaints Unit,
NSW Food Authority

^CNational Centre for Epidemiology and Population Health,
The Australian National University

Listeriosis is a foodborne disease that can cause severe illness manifesting as gastroenteritis or invasive disease. While it accounts for a fraction of all notified foodborne illness in New South Wales, all cases are hospitalised and outcomes are potentially serious. Listeriosis follows ingestion of the bacterium *Listeria monocytogenes*, found in soil, water and decaying vegetation, and commonly present on the surface of unwashed vegetables and in some processed foods. Food manufacturers are required to manage *L. monocytogenes* within production facilities. The majority of infections can therefore be prevented with good food hygiene practices, and by people at risk of listeriosis avoiding potentially contaminated foods.

Invasive listeriosis

Of the two forms, invasive listeriosis is more commonly recognised, tending to occur in high-risk groups (i.e. immunocompromised patients, and pregnant women and their foetuses). In older adults and the immunocompromised, septicaemia and meningitis are the most common clinical presentations, and case fatality is approximately 20%.¹ Pregnant women typically experience only a mild flu-like illness, however infection during pregnancy can lead to spontaneous abortion, stillbirth or pre-term delivery. Infants may be born with septicaemia, or may develop meningitis in the neonatal period, even if the mother is asymptomatic at delivery. The case fatality rate for foetuses or infants may be as high as 50% for infections acquired *in utero*.²

Non-invasive gastroenteritis

Listeriosis may present as gastrointestinal illness with fever.³ This type of infection can occur in healthy adults and is usually self-limiting.^{3,4} It can be difficult to recognise because pathology laboratories rarely test faecal specimens for *L. monocytogenes*.

One of the earliest recorded outbreaks of gastrointestinal listeriosis was in 1994 in Illinois (45 cases). Most cases presented with fever (72%) and gastroenteritis (79%) and four were hospitalised. The outbreak was traced to chocolate milk contaminated with *L. monocytogenes* served at a picnic.⁴ A larger outbreak of gastrointestinal listeriosis in northern Italy in 1997 affected around 1600 students and teachers; 292 children were hospitalised.³ The primary schools and university involved were supplied by

a single caterer, and the outbreak was traced to tinned corn served in a salad.

In 2009, Australia experienced a multi-jurisdictional outbreak of 36 cases of listeriosis, which included 22 gastrointestinal cases. The outbreak was linked to contaminated chicken wraps served primarily by an airline. All gastrointestinal cases reported suffering from fever and diarrhoea.⁵

Surveillance in Australia

The 2009 Australian outbreak of listeriosis identified a need for nationally standardised rapid subtyping of *Listeria* isolates, and centralised collection and analysis of epidemiological data. This system is now coordinated by OzFoodNet (a nationally funded network of epidemiologists who investigate foodborne diseases) with molecular typing of *L. monocytogenes* isolates performed at public health laboratories. These data, combined with questionnaire data from patients in a web-based database, allow rapid epidemiological interrogation and identification of the cause of multi-jurisdictional clusters.

Laboratory confirmation of listeriosis requires “isolation or detection of *L. monocytogenes* from a site that is normally sterile, including foetal gastrointestinal contents”. This case definition does not include isolation of the bacteria from faeces, thus national statistics only report cases of invasive disease.⁶

The national approach to *Listeria* surveillance has markedly improved Australia’s ability to detect and investigate clusters of invasive listeriosis; surveillance for gastrointestinal listeriosis remains a challenge.

References

1. OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet network, 2010. *Commun Dis Intell Q Rep* 2012; 36(3): E213–41.
2. Barton Behravesh C, Jones TF, Vugia DJ, Long C, Marcus R, Smith K et al. Deaths associated with bacterial pathogens transmitted commonly through food: foodborne diseases active surveillance network (FoodNet), 1996–2005. *J Infect Dis* 2011; 204(2): 263–7. doi:10.1093/infdis/jir263
3. Aureli P, Fiorucci GC, Caroli D, Marchiaro G, Novara O, Leone L et al. An outbreak of febrile gastroenteritis associated with corn contaminated by *Listeria monocytogenes*. *N Engl J Med* 2000; 342(17): 1236–41. doi:10.1056/NEJM200004273421702
4. Dalton CB, Austin CC, Sobel J, Hayes PS, Bibb WF, Graves LM et al. An outbreak of gastroenteritis and fever due to *Listeria monocytogenes* in milk. *N Engl J Med* 1997; 336(2): 100–5. doi:10.1056/NEJM199701093360204
5. OzFoodNet Working Group. Monitoring the incidence and causes of diseases potentially transmitted by food in Australia: annual report of the OzFoodNet network, 2009. *Commun Dis Intell Q Rep* 2010; 34(4): 396–426.
6. Ramaswamy V, Cresence VM, Rejitha JS, Lekshmi MU, Dharsana KS, Prasad SP et al. *Listeria* – review of epidemiology and pathogenesis. *J Microbiol Immunol Infect* 2007; 40(1): 4–13.