

LISTERIOSIS

(Based on the MoH Communicable Diseases Control Manual 2012¹)

Associated Documents

Case report form:

<K:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\Listeriosis\FormsStdLettersQuest\Listeriosis.pdf>

Fact sheet:

<https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/listeria>

The Illness

Listeria monocytogenes, although an uncommon cause of illness in the general population, is an important pathogen in pregnant patients, neonates, elderly individuals, and immunocompromised individuals (eg. those on steroids, have a malignancy especially of the blood, or had recent chemotherapy). About 90% of cases of listeriosis are due to the consumption of foods or beverages contaminated with high levels of the *Listeria* bacteria. *Listeria* is also a common veterinary pathogen, being associated with abortion and encephalitis in sheep and cattle. It can be isolated from soil, water, and decaying vegetation.

The most common clinical manifestation is diarrhea. In pregnancy, although the illness is unlikely to be serious for the mother, it can cause miscarriage, premature delivery or severe illness in a newborn child. Bacteraemia and meningitis are more serious manifestations of disease that can affect individuals at high risk. Unless recognized and treated, *Listeria* infections can result in significant morbidity and mortality. CNS infection may manifest as meningitis, meningoencephalitis, or abscess. Endocarditis, septic arthritis, or osteomyelitis are other possible presentations. Seventy percent of all non-perinatal infections occur in immunocompromised patients. Pregnant women account for 27% of all cases, and most occur during the third trimester.

Mortality/Morbidity

The overall mortality rate of *L. monocytogenes* infection is 20-30%. Of all pregnancy-related cases, 22% resulted in fetal loss or neonatal death, but mothers usually survive.

Age

Women of childbearing age are commonly affected. Neonates and elderly individuals are at risk.

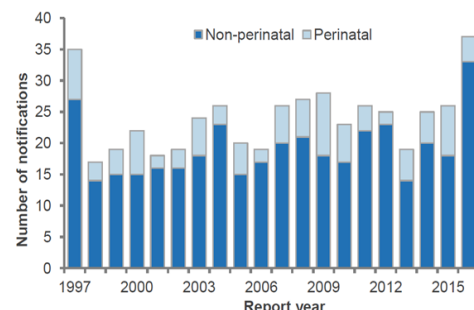
Edited from Medscape²

New Zealand Epidemiology³

Although most cases of listeriosis are sporadic, outbreaks have occurred in New Zealand. The highest rates of disease are in immunocompromised individuals and neonates.

Figure 1 shows listeriosis notifications (both perinatal and non-perinatal) for each year since 1997. The 2016 rate of 0.8 cases per 100,000 was a slight increase from the notification rate in 2015 (0.6 per 100,000). The notification rate has been relatively stable for the past 18 years (ranging from 0.4 to 0.8 per 100,000), since a peak of 0.9 per 100,000 in 1997. Two perinatal deaths from listeriosis occurred in 2016 and three in 2015.

Figure 1. New Zealand: all listeriosis notifications, by year, 1997-2016



Sources of contamination

Listeria monocytogenes is found in soil and water. Animals can carry the bacteria without appearing ill and can contaminate foods of animal origin, such as meats and dairy products. *Listeria* is unusual because it can grow at low temperatures, including refrigeration temperatures of below 5°C.⁴

CASE DEFINITION

Clinical description

Listeriosis most commonly presents with diarrhoea, often associated with fever, myalgia and vomiting. Bacteraemia most often occurs in pregnant women (usually in the third trimester), the elderly and immunosuppressed. In pregnant women, the foetus may become infected, sometimes leading to miscarriage, stillbirth, premature delivery, newborn septicaemia or meningitis. The elderly and immunosuppressed may present with septicaemia, meningitis or pyogenic foci of infection.

Reservoir

L. monocytogenes can be detected in soil, water, silage and food. Reservoirs include humans, domestic and wild animals and fowl. *Listeria* can multiply in refrigerated foods, unlike most pathogens, and can grow in biofilms.

Transmission: *L. monocytogenes* can survive and grow at normal refrigeration temperatures and ingestion of contaminated foods such as unpasteurised milk or cheese, contaminated pasteurised soft cheeses, contaminated vegetables or meat products such as pâté, or shellfish have been major sources of infection. In perinatal infections, the foetus is infected in utero or during delivery.

Infectivity: Mothers of infected infants may shed the bacteria in vaginal discharges and urine for 7–10 days after delivery. Infected individuals may shed the organism in their stool for several months, even after resolution of symptoms.

Incubation period: Variable. Outbreak cases have occurred 3–70 days following an exposure to a contaminated food product. Median incubation period is estimated to be 3 weeks.

Prevention: Strict food hygiene when handling, preparing and storing food by individuals and food manufacturers and avoidance of high risk foods by those at risk. Maintenance of a clean kitchen and food preparation areas. Thorough cooking of foods especially meat and poultry. Patients don't usually develop immunity, even after a serious infection.

Notification Procedure

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local Medical Officer of Health of suspected cases. Notification should not await confirmation.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as confirmed.
- **Probable:** Not applicable
- **Confirmed:** A clinically compatible illness accompanied by laboratory definitive evidence.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Cases can be further classified, if appropriate, as follows.

Pregnancy associated case:

Cases are classified as pregnancy-associated if illness occurs in a pregnant woman, foetus, or infant aged ≤28 days old; for these cases it is the pregnant woman or mother who is notified as the case but information regarding the foetus or infant should be included on the case form.

All other cases are considered not to be associated with pregnancy.

Laboratory Testing

Laboratory definitive evidence for a confirmed case requires identification of *Listeria monocytogenes* from a normally sterile site, including the foetal gastrointestinal tract by one of the following:

- isolation (culture) of *L. monocytogenes*
- detection of *L. monocytogenes* nucleic acid.

Management of Case

Investigation

- Action on day of notification.
- Coversheet and Fax the Case Report Form to the notifying doctor for completion.
- Interview the case and obtain a food history (use the [questionnaire at Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\Listeriosis\FormsStdLettersQuest\QuestionnaireListeria190501.docx](#));
- Obtain details of pregnancy for cases of perinatal infection; and for other cases, medical co-morbidity and ingestion of potentially contaminated foodstuffs.
- Ensure samples from symptomatic people and any foodstuffs implicated have been cultured for *L. monocytogenes*.
 - Discretion should be applied before testing of food items linked to sporadic cases. Testing may be of value if food items were consumed shortly after purchase and were stored in their original unopened packaging before consumption; however, testing of leftover items that have been stored in previous-opened packaging is unlikely to be useful in the investigation of a sporadic case, and may not be a good use of resources.
 - Testing may be more liberally undertaken in an outbreak situation.

Environmental testing

(see also **Other Control Measures** below)

- i) The decision to sample food from the case's home and swab the refrigerator should first be discussed with the MOH prior to the visit. The aim is to determine if foodborne pathogens are present in the environment.
- ii) For list of suspect foods refer to **Health Education in Other Control Measures** below
- iii) **Swabbing**
 - The LabServ flexi-swab has been specially designed for the environmental sampling of *Listeria*. Unused swabs must be stored under refrigeration.
 - To reduce contamination, gloves should be worn.
 - Remove the flexi-swab from the tube by twisting and pulling. Press foam against the tube to remove excess diluent.
 - Swab the areas of interest (take several swabs from the inside of the refrigerator), insert each swab into its tube, and firmly close the cap.
 - Swabs should be labelled (see instructions following).
- iv) **Food sampling**
 - To reduce contamination, gloves should be worn.
 - Suspect foods should be sampled and placed into a new Ziploc bags, sealed completely and labelled (see instructions following).
 - This information should also be recorded in the sample notebook and food microbiology laboratory form.
- v) **Labelling**
 - Label the specimen tubes with sample number, date and site (premise) and type (eg, inside wall of refrigerator, bench etc.), and if it is part of an outbreak / EpiSurv number.
- vi) **Transport**
 - All samples should be kept chilled from the time of collection until received by the laboratory.
- vii) **Disinfection**
 - If the case's fridge contains suspect foods, they should be sampled and then disposed of and if indicated, the fridge wiped with a hypochlorite solution (one part fresh bleach to 100 parts water).

- Molecular subtyping may be used to determine the association between isolates from cases and any foodstuffs that test positive for *L. monocytogenes*.
- Investigate the source of contamination of any foods found to test positive for *L. monocytogenes*.
- Recall contaminated foodstuffs if necessary.
- Investigate the source of contamination of any foods found to test positive for *L. monocytogenes*.
- If a contaminated commercial food source is suspected or identified, liaise with the Ministry for Primary Industries.
- If cheese is possibly implicated, the nature, type and source should be obtained (see **Other Control Measures**).
- If a food source is identified discuss with the MOH and Ministry of Primary Industries the possibility of a media release with the MOH.
- Ministry of Primary Industry to recall contaminated foodstuffs if necessary.

Restriction

- Nil

Disinfection

- Enteric precautions.
- As faecal matter is contagious ensure hygienic disposal down the toilet, double bag disposable nappies and thorough hand washing and strict personal hygiene precautions after toileting and nappy changing.

Counselling

- Advise the case and their caregivers of the nature of the infection and its mode of transmission. Asymptomatic mothers of neonatal cases can shed the organism for up to 10 days after delivery.
- Case to avoid contact with pregnant women, neonates and immunocompromised persons during the illness. If case is health care worker, he/she should discuss their situation with their Infection Control officer.
- A fact sheet is available. <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/listeria>

Management of Contacts/Outbreak Control

Discuss the investigation with the MoH if an outbreak.

Definition

All people who have been exposed to the same food material suspected to be the source of infection.

Investigation

Treat contacts who are symptomatic as cases and Investigate.

Restriction

Nil

Prophylaxis

Nil

Counselling

- Advise the case and their caregivers of the nature of the infection and its mode of transmission. Advise all contacts to seek early medical attention if symptoms develop.
- A fact sheet is available. <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/listeria>

Other Control Measures

Identification of source

- If a contaminated commercial food source is suspected or identified, liaise with the Ministry for Primary Industries.
- A detailed investigation should be undertaken if two or more related cases have occurred.
- Liaise with the Environmental Health Officer of the TLA if food premises are thought to be involved.
- Discuss with the Water team the possibility of sampling the water supply. Check the water tank if supply from the roof.

Note: Cheese made from Unpasteurised milk

Although homemade cheese can be made from unpasteurised milk most available cheeses in New Zealand are manufactured from pasteurised milk. However under standards set by MPI there are now available a limited number of raw milk hard cheeses made both in New Zealand and imported from the EU and Switzerland. Consumption of hard chesses carries a lower risk of contracting listeriosis. Soft cheese made from pasteurised milk reduces the risk but does not eliminated it. Consumption of any soft cheese is not recommended. When investigating a listeriosis case the nature, type and source of cheese should be obtained.

Health education⁵

- Advise pregnant women, the elderly and immunosuppressed people to avoid the following foods [includes foods that require refrigeration for a long shelf life]:
 - smoked fish or shellfish, pre-cooked fish and uncooked fish or seafood products (including sushi and sashimi) that are chilled or frozen (unless reheated thoroughly and eaten hot)
 - pre-cooked meat products such as pâté and sliced deli meat (chicken, ham, salami)
 - paté, hummus-based dips and spreads
 - pre-prepared or stored salads (including fruit salad) and coleslaws
 - raw (unpasteurised) milk and foodstuffs that contain unpasteurised milk
 - soft-serve ice creams
 - surface-ripened soft cheese (for example, brie, camembert, ricotta, blue vein, feta).
 - ham and all other chilled pre-cooked meat products including salami and other fermented or dried sausages.

Note: the foods on this list are safe to eat if heated thoroughly to steaming hot (ie, above 70°C) where appropriate. Hard cheeses, processed cheeses, cream cheese, cottage cheese and yoghurt are also safe.

- Educate the public about safe food preparation⁶ (Ministry of Health, Communicable Disease Control Manual 2012, <http://www.health.govt.nz/system/files/documents/publications/cd-manual-appendices-may2012.pdf>)
- Advise pregnant women, the elderly and immunosuppressed people to avoid contact with potentially infective farm material, such as aborted animal fetuses.
- A fact sheet is available: <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/listeria>

Reporting

- Ensure complete case information is entered into EpiSurv.
- If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.
- Where food/food businesses are thought to be involved inform the Ministry for Primary Industries.
- If an outbreak, write report for Outbreak Report File [...Com Diseases\Com Disease Control\Outbreaks \...\Reports]
- File.

References and further information

1. Listeriosis chapter, MoH Communicable Diseases Control Manual 2012
<http://www.health.govt.nz/system/files/documents/publications/cd-manual-listeriosis-may2012.pdf>
2. Karen B Weinstein Listeria monocytogenes infection (listeriosis). Medscape, <http://emedicine.medscape.com/article/220684-overview> Updated: Dec 15, 2016.
3. Listeriosis. Notifiable Diseases in New Zealand: Annual Report 2015. ESR
[https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2015/2015AnnualReport Final. pdf](https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2015/2015AnnualReport%20Final.pdf)
4. Ministry for Primary Industries: industry, General requirements and Programmes, Foodborne illness, Listeria, Sources of contamination
<http://www.foodsafety.govt.nz/industry/general/foodborne-illness/listeria/>
5. Food safety: Pregnant and at-risk people at www.mpi.govt.nz/food-safety/pregnant-and-at-risk-people.)
6. Appendix 3, Patient Information. Ministry of Health, Communicable Disease Control Manual 2012,
<http://www.health.govt.nz/system/files/documents/publications/cd-manual-appendices-may2012.pdf>