

## Listeriosis



### Case Definition

**Adults:** Clinically compatible illness (see below) with the isolation of *Listeria monocytogenes* from a site that is normally sterile.

**Newborns:** A gram-stained smear of meconium from infants with clinically suspected listeriosis, showing gram-positive rods resembling *L. monocytogenes*.

### Reporting Requirements

- All positive laboratory tests for *Listeria monocytogenes* are reportable by laboratory.
- All cases are reportable by attending health care professional.

### Clinical Presentation/Natural History

A bacterial disease that usually manifests as meningoen­cephalitis and/or septicemia in newborns and adults, and abortion in pregnant women. Illness is rare; many infections are asymptomatic.

**Infants:** May be stillborn, born with septicemia or develop pneumonia. Late-onset infection (after the first week of life ) often results in meningitis.

**Elderly, immunocompromised persons, rarely children/young adults:** May appear as septicemia and/or meningoen­cephalitis. The onset of meningoen­cephalitis may be sudden, with fever, intense headache, nausea, vomiting and signs of meningeal irritation. Delirium and coma may appear early; occasionally there is collapse and shock. Endocarditis, granulomatous lesions in the liver and other organs, localized internal or external abscesses, and pustular or papular cutaneous lesions may occur.

**Pregnant women:** Infection in pregnant women may be asymptomatic or result in a mild febrile illness, but the infection can still be transferred to the fetus. Abortion may occur, rarely as early as the second month of pregnancy but usually in the second half of pregnancy; perinatal infection is acquired following maternal infection during the last trimester. The postpartum maternal course is usually uneventful.

**Other adults:** May exhibit only an acute, mild, febrile illness, sometimes with influenza-like symptoms. Listeriosis has also been identified as a cause of acute gastroenteritis syndrome.

### Etiology

*Listeria monocytogenes* is a small Gram positive rod-shaped bacterium; human infections are usually caused by serovars 1/2a, 1/2b and 4b.

### Epidemiology

**Reservoir and Source:** Principal reservoirs are water, mud and silage. Other reservoirs include infected domestic and wild mammals, fowl and people. Asymptomatic fecal carriage is common in humans (up to 10%) and animals. The seasonal use of silage as fodder is frequently followed by an increased incidence of listeriosis in animals. Soft cheeses made from unpasteurized milk may support the growth of *Listeria* during ripening and have been the source of outbreaks. Outbreaks of listeriosis have been associated with ingestion of raw or contaminated milk, contaminated vegetables, and ready-to-eat meats, such as pâté.

**Transmission:** A substantial proportion of sporadic cases of listeriosis results from foodborne transmission such as through ingestion of *Listeria* in unpasteurized milk, cheese and contaminated vegetables.

In-utero or perinatal transmission can occur, and person-to-person spread has been reported (nursery, nosocomial). Papular lesions on hands and arms may result from direct contact with infectious material.

## Occurrence:

**General:** Worldwide. Illness is rare; most infections are asymptomatic. Listeriosis is an uncommonly diagnosed disease with an incidence in the United States of illness requiring hospitalization of about 1/200,000 population. Typically it occurs sporadically; outbreaks can occur in all seasons. Outbreaks in Quebec have been associated with consumption of soft cheeses. About 30% of clinical cases occur within the first three weeks of life; in non-pregnant adults, infection occurs mainly after age 40. Asymptomatic infections probably occur at all ages, although they are of importance only during pregnancy.

**Manitoba:** Infection is sporadic. Seventeen cases were reported from 1995 to 1999.

**Incubation Period:** Variable; outbreak cases have occurred three to 70 days following a single exposure to an implicated product. Median incubation time is estimated as three weeks.

**Susceptibility and Resistance:** Those at highest risk are neonates, the elderly, immunocompromised persons and pregnant women. Fetuses and newborn infants are highly susceptible. Children and young adults generally are resistant, adults less so after age 40. Disease is frequently superimposed on other debilitating illnesses such as cancer, organ transplantation, diabetes and AIDS. There is little evidence of acquired immunity, even after prolonged severe infection.

**Period of Communicability:** Unknown. Mothers of infected newborns may shed the organism in vaginal secretions and urine for seven to 10 days after delivery. Infected persons may shed the organisms in their stools for several months.

## Diagnosis

Confirmed by isolation of the bacteria from cerebrospinal fluid, blood, amniotic fluid, placenta, meconium, lochia, gastric washings and other sites of infection. *Listeria monocytogenes* can be readily isolated from normally sterile sites on routine media, but care must be taken to distinguish this organism from other gram-positive rods, particularly diphtheroids. Isolations from contaminated specimens are more frequent with improved selective enrichment media. Microscopic examination of CSF or meconium permits presumptive diagnosis; serologic tests are under development.

## Key Investigations

- Collect food samples for culture.
- History of consumption of soft (unpasteurized) cheese from producers in Quebec. Manitoba also has a few unpasteurized cheese producers.
- History of contact with infective materials: aborted fetuses on farms, sick or dead animals (especially sheep with encephalitis).
- History of day care or hospital exposure.
- History of occupational exposure.

## Control

### Management of Cases:

- Prophylactic antibiotics should be administered to asymptomatic newborns if they have short gram-positive rods in meconium.

### Treatment:

- Penicillin or ampicillin alone or together with aminoglycosides. For penicillin-allergic patients, TMP-SMX or erythromycin is preferred. Cephalosporins, including third-generation cephalosporins, are not effective in the treatment of clinical listeriosis. Tetracycline resistance of the organism has been recently observed.

## Management of Contacts:

- No public health intervention is required.

## Management of Outbreaks:

- Investigate outbreaks to identify a common source of infection, and prevent further exposure to that source.

## Preventive Measures:

- Education of pregnant women and immunocompromised persons to avoid contact with potentially infectious material (such as aborted animal fetuses), eat properly cooked meats and pasteurized dairy products, and thoroughly wash raw vegetables before eating.
- Education of veterinarians and farmers to take proper precautions in handling aborted fetuses, and sick or dead animals.
- Pasteurization of all dairy products where possible. Soft cheeses are candidates for irradiation after ripening. Monitoring of non-pasteurized dairy products such as soft cheeses by culturing for *Listeria*. The Health Protection Branch, Health Canada, is responsible for this process for imported products.
- Identification of clusters that could be investigated for possible common source outbreaks.
- Ensuring safety of foods of animal origin.
- Avoiding the use of untreated manure on vegetable crops.