



COMMITTEE OPINION

Number 614 • December 2014

Committee on Obstetric Practice

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Management of Pregnant Women With Presumptive Exposure to *Listeria monocytogenes*

ABSTRACT: Listeriosis is predominantly a foodborne illness, with sporadic and outbreak-related cases tied to consumption of food contaminated with listeria (*Listeria monocytogenes*). The incidence of listeriosis associated with pregnancy is approximately 13 times higher than in the general population. Maternal infection may present as a nonspecific, flu-like illness with fever, myalgia, backache, and headache, often preceded by diarrhea or other gastrointestinal symptoms. However, fetal and neonatal infections can be severe, leading to fetal loss, preterm labor, neonatal sepsis, meningitis, and death. Pregnant women have been advised to avoid foods with a high risk of contamination with listeria. An exposed pregnant woman with a fever higher than 38.1°C (100.6°F) and signs and symptoms consistent with listeriosis for whom no other cause of illness is known should be simultaneously tested and treated for presumptive listeriosis. No testing, including blood and stool cultures, or treatment is indicated for an asymptomatic pregnant woman who reports consumption of a product that was recalled or implicated during an outbreak of listeria contamination. A pregnant woman who ate a product that was recalled because of listeria contamination and who is afebrile but has signs and symptoms consistent with a minor gastrointestinal or flu-like illness can be managed expectantly.

Listeriosis is predominantly a foodborne illness, with sporadic and outbreak-related cases tied to consumption of food contaminated with listeria (*Listeria monocytogenes*) (1–6). Listeria is an aerobic and facultative anaerobic, gram-positive bacillus that is found readily in the environment. *Invasive listeriosis*, defined as isolation of listeria from a normally sterile site (typically blood or cerebrospinal fluid), is uncommon. Although there are no prospective data to guide recommendations for the care of pregnant women with known or presumptive exposure to listeria, outbreak-related cases of listeriosis have highlighted the need for such guidance. This Committee Opinion provides background information on listeriosis in pregnancy as well as management recommendations, largely based on expert opinion, for known or suspected cases of listeriosis in pregnancy that are associated with outbreaks and product recalls.

Incidence

In 2010, there were a reported 0.27 cases of listeriosis per 100,000 people in the United States (7). However, the incidence of listeriosis associated with pregnancy

is approximately 13 times higher than in the general population (8). The incidence of pregnancy-associated listeriosis is markedly higher among Hispanic women (8.9 per 100,000) compared with non-Hispanic women (2.3 per 100,000) (8). Nearly all pregnancy-associated cases of listeriosis occur in otherwise healthy women with no additional predisposing risk factors (9). Although listeriosis has been diagnosed mainly in the third trimester, the incidence at earlier gestational ages may be underreported because of the relative infrequency of culturing products of conception in cases of early fetal loss (10).

Maternal and Perinatal Outcomes

Maternal infection may be asymptomatic. When it is symptomatic, infection generally presents as a nonspecific, flu-like illness with fever, myalgia, backache, and headache, often preceded by diarrhea or other gastrointestinal symptoms (9, 11). However, fetal and neonatal infections can be severe, resulting in fetal loss, preterm labor, neonatal sepsis, meningitis, and death. A case series of 11 pregnant women with listeriosis and an accompanying review of 222 cases in the literature found that



approximately one in five pregnancies complicated by listeriosis resulted in spontaneous abortion or stillbirth; approximately two thirds of surviving infants developed clinical neonatal listeriosis (9). Active, population-based surveillance for listeriosis determined that 17% of 760 listeriosis cases reported in 10 U.S. geographic sites from 2004 to 2009 were associated with pregnancy, with an overall perinatal mortality (fetal loss or neonatal death) rate of 29% (8).

Management

In the United States, efforts have been aimed at the prevention of listeriosis, including reducing listeria contamination of ready-to-eat foods, such as processed meats; proper food preparation and storage; and general food safety, hygiene, and sanitation, with information on safe practices found at www.cdc.gov/listeria/prevention.html (12). In addition, women have been advised to avoid high-risk foods during pregnancy (Box 1). Although recommendations exist for treating pregnant women with listeriosis (10, 13, 14), few guidelines exist for management of cases of possible exposure in pregnancy. High-profile listeriosis outbreaks, such as the multistate outbreak in the fall of 2011 and the resultant publicized recall of cantaloupes grown on a single farm, highlight the need for such guidance (15).

The following recommendations provide guidance for the management of pregnant women with presumptive exposure to listeria in three clinical scenarios: women who are 1) asymptomatic, 2) mildly symptomatic but afebrile, and 3) febrile with or without other symptoms of listeriosis (see Fig. 1).

Box 1. Foods With a High Risk of Contamination With Listeria ⇐

Pregnant women should avoid eating the following foods:

- Hot dogs, lunch meats, cold cuts (when served chilled or at room temperature; heat to internal temperature of 74°C [165°F] or steaming hot)
- Refrigerated pâté and meat spreads
- Refrigerated smoked seafood
- Raw (unpasteurized) milk
- Unpasteurized soft cheeses such as feta, queso blanco, queso fresco, Brie, queso panela, Camembert, and blue-veined cheeses
- Unwashed raw produce such as fruits and vegetables (when eating raw fruits and vegetables, skin should be washed thoroughly in running tap water, even if it will be peeled or cut)

Data from Centers for Disease Control and Prevention. Listeria (listeriosis). Prevention. Available at: <http://www.cdc.gov/listeria/prevention.html>. Retrieved July 25, 2014.

Asymptomatic

No testing, including blood and stool cultures, or treatment is indicated for an asymptomatic pregnant woman who reports consumption of a product that was recalled or implicated during an outbreak of listeria contamination. An asymptomatic patient should be instructed to return if she develops symptoms of listeriosis within 2 months of eating the recalled or implicated product. There is no reason to alter or begin fetal surveillance in asymptomatic women with known or presumptive exposure to listeria.

Mildly Symptomatic but Afebrile

There are no data to guide the management of an exposed, afebrile pregnant woman with mild symptoms that do not strongly suggest listeriosis. A pregnant woman who ate a product that was recalled because of listeria contamination and who is afebrile but has signs and symptoms consistent with a minor gastrointestinal or flu-like illness (such as mild myalgia, mild nausea, vomiting, or diarrhea) can be managed expectantly (ie, the same as for an exposed, asymptomatic pregnant woman). This is a reasonable approach that limits low-yield testing. Alternatively, such a patient could be tested with blood culture for listeria, but if such a course is elected, specific instruction should be given to the microbiology laboratory. Because the morphology of listeria resembles that of diphtheroids, it may be mistaken for a contaminant (9). Therefore, the laboratory should be alerted to the clinical suspicion of listeriosis. If such diagnostic testing is performed, some experts would withhold antibiotic therapy unless the culture yielded listeria. Others would initiate antibiotic therapy, although no effectiveness data exist to help clinicians and patients evaluate the risks and benefits of such a treatment choice. If testing is undertaken and the blood culture yields listeria, standard antimicrobial treatment for listeriosis, typically including intravenous ampicillin, would be indicated (see following section). Assessments of fetal well-being should be addressed on an individualized basis with consideration given to the degree of concern for infection and the patient's clinical status.

Febrile With or Without Other Symptoms Consistent With Listeriosis

An exposed pregnant woman with a fever higher than 38.1°C (100.6°F) and signs and symptoms consistent with listeriosis for whom no other cause of illness is known should be simultaneously tested and treated for presumptive listeriosis.

Diagnosis is made primarily by blood culture. Placental cultures should be obtained in the event of delivery. If blood cultures are negative after the recommended antibiotic regimen has begun, the decision about whether or not to continue antibiotics should be made using clinical judgment combined with consultation(s) with an infectious disease specialist, a maternal-fetal medicine specialist, or both.



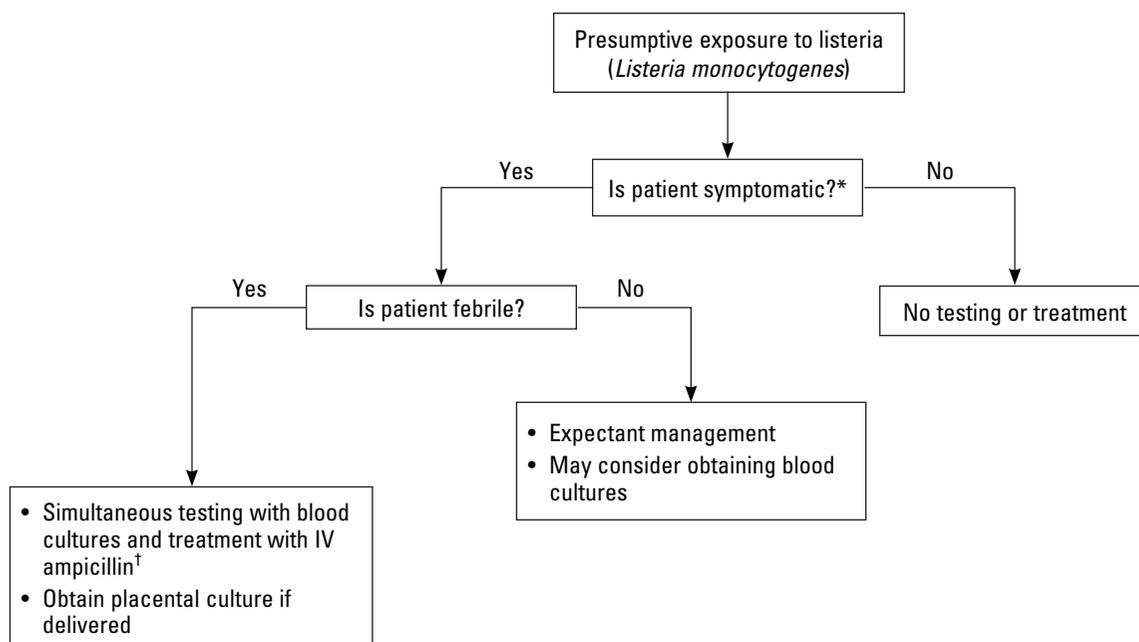


Fig. 1. Management of pregnant women with presumptive exposure to listeria.

Abbreviation: IV, intravenous.

*Symptoms include flu-like symptoms, such as myalgia, abdominal or back pain, nausea, vomiting, or diarrhea.

†Trimethoprim with sulfamethoxazole should be used if patient is allergic to penicillin. ⇐

Listeria survives and grows within host cells, so infection does not respond favorably to bacteriostatic antibiotics. The antimicrobial regimen of choice for treatment of listeriosis is high-dose intravenous ampicillin (at least 6 g/day) for nonallergic patients for at least 14 days (14). Frequently, gentamicin is added to the treatment regimen because it has demonstrated synergism with ampicillin (16), although not all authorities agree that this adds to the effectiveness of the regimen, especially given the toxicity of gentamicin (14). Women who are allergic to penicillin, ampicillin, or both present a clinical conundrum; trimethoprim with sulfamethoxazole is the generally recommended alternative to ampicillin (14). The Centers for Disease Control and Prevention considers listeriosis a nationally notifiable disease, and once diagnosis is confirmed, health care providers should contact their state public health departments to comply with local requirements for reporting.

Although blood cultures are the standard for diagnosis in cases of fever and symptoms consistent with listeriosis, if an amniocentesis has been performed, it usually reveals meconium staining and gram-positive rods (17). This information may help guide management when the diagnosis is uncertain (18).

Initiating a program of fetal surveillance seems prudent for women in whom listeriosis is diagnosed or strongly suspected because of exposure and fever with or without other symptoms, although studies and data do not exist to point to one best plan for such testing.

Stool Culture

In the aforementioned clinical scenarios, management guidance does not include stool culture for listeria because such cultures have not been validated as a screening tool and are not recommended for the diagnosis of listeriosis. Ingestion of listeria occurs frequently because the bacterium is commonly present in the environment. Therefore, intermittent fecal carriage and shedding of listeria are also frequent (approximately 5% in unselected populations, but substantial variation exists) and rarely indicative of infection (10). Furthermore, stool culture for listeria may have low sensitivity and is not available in most clinical laboratories.

Conclusion

Listeriosis is predominantly a foodborne illness caused by consumption of food contaminated with the bacterium listeria. Pregnant women are about 13 times more likely than the general population to get listeriosis (8). Maternal infection may manifest as a nonspecific, flu-like illness with fever but can result in severe fetal and neonatal infection, leading to fetal loss, preterm labor, neonatal sepsis, meningitis, and death. Pregnant women should be advised to avoid foods with a high risk of contamination with listeria (see Box 1). Management recommendations for cases of known or suspected listeria exposure during pregnancy, such as those associated with an outbreak or product recall, are summarized in Figure 1.



References

1. Schlech WF 3rd, Lavigne PM, Bortolussi RA, Allen AC, Haldane EV, Wort AJ, et al. Epidemic listeriosis—evidence for transmission by food. *N Engl J Med* 1983;308:203–6. [PubMed] ↩
2. Listeriosis associated with consumption of turkey franks. Centers for Disease Control (CDC). *MMWR Morb Mortal Wkly Rep* 1989;38:267–8. [PubMed] ↩
3. Linnan MJ, Mascola L, Lou XD, Goulet V, May S, Salminen C, et al. Epidemic listeriosis associated with Mexican-style cheese. *N Engl J Med* 1988;319:823–8. [PubMed] ↩
4. Schwartz B, Ciesielski CA, Broome CV, Gaventa S, Brown GR, Gellin BG, et al. Association of sporadic listeriosis with consumption of uncooked hot dogs and undercooked chicken. *Lancet* 1988;2:779–82. [PubMed] ↩
5. Fleming DW, Cochi SL, MacDonald KL, Brondum J, Hayes PS, Plikaytis BD, et al. Pasteurized milk as a vehicle of infection in an outbreak of listeriosis. *N Engl J Med* 1985;312:404–7. [PubMed] [Full Text] ↩
6. Schuchat A, Swaminathan B, Broome CV. Epidemiology of human listeriosis [published erratum appears in *Clin Microbiol Rev* 1991;4:396]. *Clin Microbiol Rev* 1991;4:169–83. [PubMed] [Full Text] ↩
7. Adams DA, Gallagher KM, Jajosky RA, Kriseman J, Sharp P, Anderson WJ, et al. Summary of Notifiable Diseases - United States, 2011. Division of Notifiable Diseases and Healthcare Information, Office of Surveillance, Epidemiology, and Laboratory Services, CDC [published erratum appears in *MMWR Morb Mortal Wkly Rep* 2014;63:24]. *MMWR Morb Mortal Wkly Rep* 2013;60(53):1–117. [PubMed] [Full Text] ↩
8. Silk BJ, Date KA, Jackson KA, Pouillot R, Holt KG, Graves LM, et al. Invasive listeriosis in the Foodborne Diseases Active Surveillance Network (FoodNet), 2004–2009: further targeted prevention needed for higher-risk groups. *Clin Infect Dis* 2012;54(suppl 5):S396–404. [PubMed] [Full Text] ↩
9. Mylonakis E, Paliou M, Hohmann EL, Calderwood SB, Wing EJ. Listeriosis during pregnancy: a case series and review of 222 cases. *Medicine* 2002;81:260–9. [PubMed] ↩
10. Lamont RF, Sobel J, Mazaki-Tovi S, Kusanovic JP, Vaisbuch E, Kim SK, et al. Listeriosis in human pregnancy: a systematic review. *J Perinat Med* 2011;39:227–36. [PubMed] [Full Text] ↩
11. Jackson KA, Iwamoto M, Swerdlow D. Pregnancy-associated listeriosis. *Epidemiol Infect* 2010;138:1503–9. [PubMed] ↩
12. Centers for Disease Control and Prevention. Listeria (listeriosis): prevention. Available at: <http://www.cdc.gov/listeria/prevention.html>. Retrieved July 29, 2014. ↩
13. Silver HM. Listeriosis during pregnancy. *Obstet Gynecol Surv* 1998;53:737–40. [PubMed] ↩
14. Janakiraman V. Listeriosis in pregnancy: diagnosis, treatment, and prevention. *Rev Obstet Gynecol* 2008;1:179–85. [PubMed] [Full Text] ↩
15. Centers for Disease Control and Prevention. Multistate outbreak of listeriosis linked to whole cantaloupes from Jensen Farms, Colorado. Atlanta (GA): CDC; 2012. Available at: <http://www.cdc.gov/listeria/outbreaks/cantaloupes-jensen-farms/082712/index.html>. Retrieved July 29, 2014. ↩
16. Temple ME, Nahata MC. Treatment of listeriosis. *Ann Pharmacother* 2000;34:656–61. [PubMed] ↩
17. Mazor M, Froimovich M, Lazer S, Maymon E, Glezerman M. Listeria monocytogenes. The role of transabdominal amniocentesis in febrile patients with preterm labor. *Arch Gynecol Obstet* 1992;252:109–12. [PubMed] ↩
18. Craig S, Permezel M, Doyle L, Mildenhall L, Garland S. Perinatal infection with Listeria monocytogenes. *Aust N Z J Obstet Gynaecol* 1996;36:286–90. [PubMed] ↩

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Management of pregnant women with presumptive exposure to Listeria monocytogenes. Committee Opinion No. 614. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2014; 124:1241–4.

