

# Diagnosis and Management of Foodborne Illnesses

A Primer for Physicians

*Listeria monocytogenes* Infection – Patient Scenario

## *Listeria monocytogenes* Infection Patient Scenario

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This learning scenario can be used to reinforce medical management information pertaining to foodborne illnesses, such as that provided from the other booklets of this primer. This case study provides questions that need to be considered when dealing with a potential case of foodborne illness. Answers are provided immediately following the questions to enhance the learning process.

Similar learning scenarios are also available for other foodborne pathogens.

### **Listeria monocytogenes Infection, a Patient Scenario**

Sandy, the pregnant mother of a 2-year-old boy presents to your office at 28 weeks' gestation complaining of fever, chills, headache, myalgias, and sore throat. She has previously been healthy and has had an uncomplicated pregnancy. She is somewhat concerned about the illness because she just returned from Kenya a few weeks earlier.

Physical examination reveals a temperature of 102°F, pulse of 100 beats per minute, respirations of 20 breaths per minute, and a blood pressure of 100/60 mm Hg. Her posterior pharynx is nonerythematous with no tonsillar enlargement or exudates. She has no remarkable cervical lymphadenopathy. Breath sounds are clear and equal bilaterally, and her abdomen is remarkable only for her gravid uterus. She has normal capillary refill and no petechiae or rashes.

#### **What should be included in the differential diagnosis?**

Viral illness	Influenza
	Adenovirus
	Coxsackie virus
	Primary herpes
	Primary Human Immunodeficiency Virus (HIV)
	Infectious Mononucleosis (Epstein-Barr Virus [EBV])
	Cytomegalovirus (CMV)
Parvovirus	
Tickborne diseases	Ehrlichiosis
	Babesiosis
	Rocky Mountain Spotted Fever
Bacterial diseases	Mycoplasma
	Group A <i>Streptococcus</i> pharyngitis
	Gonococcal pharyngitis
	Bacteremia ( <i>Listeria monocytogenes</i> , Group B <i>Streptococcus</i> , <i>Salmonella typhi</i> )
Parasitic diseases	Malaria

### **What additional information would assist with the diagnosis?**

What season of the year is it?

Do other household members have similar symptoms?

What is her occupation?

Has she been around ill children or adolescents?

Has she been camping, hiking, or exposed to ticks?

When did she travel to Kenya; where did she visit?

Did she take malaria prophylaxis, and what medication?

Has she been sexually active with more than one partner during the last 6 months?

Is she on any medications currently?

Has she had any animal exposures?

It is early autumn and no other household members are ill. She is a legal secretary; none of the clients with whom she has worked have been ill, and she has not been around ill children or adolescents. Her 2-year-old son attends day care; he has been well and there have been no reports of ill children from the center director. She traveled to Nairobi, Kenya, at 15 weeks' gestation, and was well throughout the trip. She took mefloquine for malaria prophylaxis once weekly, and did not forget any doses. She has not been camping or hiking, and is unaware of tick exposure. She recalls only one day of mild illness during her pregnancy, which occurred about 5 weeks earlier and was characterized by 2 or 3 episodes of vomiting and a few loose stools. She attributed the symptoms to a change in diet; she increased milk and fruit consumption in an attempt to be "healthy for the baby." She and her husband have been happily married for 5 years; she denies having any other sexual partners. She is currently taking no medications, and she has had no animal exposures except for her pet dog.

### **How does this information assist with the diagnosis?**

Influenza is an unlikely diagnosis; it is early autumn and Sandy has not been exposed to other ill persons at home or work. Her sexual history indicates her risk for HIV, herpes, and gonorrhea infection is low. Her recreational history suggests tickborne disease is improbable. Malaria is a possible diagnosis but she has had no fever in the 12 weeks since she returned from Nairobi, a city over 5,000 feet above sea level where the risk of contracting malaria is low. *Mycoplasma*, adenovirus, coxsackie virus, group A *Streptococcus*, CMV, EBV, parvovirus, and other viral agents could account for her symptoms. She could also be bacteremic, but has no symptoms to indicate she is septic.

### **What diagnostic tests are needed?**

Consider rapid antigen screen for group A *Streptococcus*

Consider rapid test for infectious mononucleosis

Consider urinalysis and thick and thin blood smear

The rapid tests for group A *Streptococcus* and infectious mononucleosis are negative. Urinalysis is negative for bacteria and thick and thin blood smear shows no evidence of malaria parasites. One hour after an appropriate dose of acetaminophen, her temperature is 101°F, and she continues to have flu-like symptoms. Her blood pressure, capillary refill, and the rest of her physical examination are normal. She returns home with instructions to call you if she develops new symptoms, her symptoms worsen, or her symptoms do not abate in the next 24 hours.

Four weeks later, you receive another call from Sandy. She reports her water just broke. She has otherwise been well; the flu-like symptoms she had at her last visit resolved within 48 hours. You meet her in the labor and delivery suite, and

confirm by physical examination that her membranes are prematurely ruptured. Despite tocolytic therapy, her labor progresses and she delivers an infant girl at 32 weeks' gestation. After delivery, Sandy has a normal post-partum course. The infant is admitted to the neonatal intensive care unit and requires supplemental oxygen for the first few hours of life, but soon after is weaned off oxygen and tolerates her first feeding without difficulty. At 22 hours of age, the infant's nurse notes she is tachypneic with intercostal retractions. The infant's blood pressure is in the low range of normal. The nurse is repeating the blood pressure measurement when the infant becomes bradycardic with delayed capillary refill. Despite full resuscitation efforts including intubation and inotropic support, the infant dies. The next morning you receive a report from the microbiology laboratory that blood cultures drawn just before the infant's death are growing gram-positive short rods/cocci.

### **What were the most likely causes of the infant's sepsis?**

Group B *Streptococcus*

*Staphylococcus aureus*

Coagulase-negative *Staphylococcus*

*Enterococcus*

$\alpha$ -hemolytic *Streptococcus*

*Listeria monocytogenes*

Group B *Streptococcus* and *Escherichia coli* (a gram-negative rod) are responsible for up to 75% of cases of early-onset neonatal sepsis. *Listeria monocytogenes*, a less common cause of early-onset neonatal sepsis, also causes an illness that clinically parallels that of group B *Streptococcus*; infants are infected *in utero* and develop illness at birth or shortly thereafter.

The following morning, the microbiology laboratory calls to report it has identified the gram-positive short rods/cocci in the blood as *Listeria monocytogenes*.

### **What, if anything, could have been done to prevent this infant's death?**

Listeriosis is an uncommon disease; approximately 1,200 cases of *Listeria monocytogenes* infection are reported each year in the United States. Up to one third of these infections occur in pregnant women, and can be complicated by maternal bacteremia, fetal loss, or infant bacteremia and meningitis. The symptoms associated with listeriosis during pregnancy are often nonspecific and may imitate those of influenza. These flu-like symptoms coincide with the bacteremic phase of infection. In pregnant women with a febrile illness, appropriate clinical management may include obtaining blood cultures to rule out listeriosis.

Fetal infection most likely results from transplacental transmission of maternal bacteremia. Neonatal infection can be prevented if maternal *Listeria monocytogenes* is treated with the appropriate antibiotics during pregnancy.

*Listeria* has been epidemiologically linked to such foods as fresh soft cheeses, ready-to-eat deli meats, hot dogs, and unpasteurized and inadequately pasteurized milk. Its ability to grow at temperatures as low as 3°C permits multiplication in refrigerated foods. Any one of these could have been the vector for this case.

All pregnant women should receive dietary counseling to avoid foods that increase the risk of *Listeria monocytogenes* infection. They should be advised to avoid unpasteurized milk and cheeses made from unpasteurized

milk (particularly fresh soft cheeses) during pregnancy. All pregnant women should cook (until steaming hot) leftover foods or ready-to-eat foods such as hot dogs, before eating, and wash their hands carefully to avoid cross-contamination if preparing these foods for others.

Other groups at high risk for listeriosis are elderly and immunocompromised patients. They frequently present with sepsis or meningitis. People in these high-risk groups should also receive dietary counseling to avoid high-risk foods.