

**Please read this section first**

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT-11/00142**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

## MICROBIOLOGY LEGEND

### CYCLE 32 ORGANISM 4

#### LISTERIOSIS

*Listeria monocytogenes* is a Gram-positive rod-shaped bacterium. It is the agent of **listeriosis**, a serious infection caused by eating food contaminated with the bacteria. Listeriosis has been recognized as an important public health problem in the United States. The disease affects primarily pregnant women, newborns, and adults with weakened immune systems. Listeriosis is a serious disease for humans; the **overt form** of the disease has mortality greater than 25 percent. The two main clinical manifestations are sepsis and meningitis. Meningitis is often complicated by encephalitis, a pathology that is unusual for bacterial infections.

#### What are the Symptoms of Listeriosis?

A person with listeriosis usually has fever and muscle aches, sometimes preceded by diarrhea or other gastrointestinal symptoms. Almost everyone who is diagnosed with listeriosis has "invasive" infection, in which the bacteria spread beyond the gastrointestinal tract. The symptoms vary with the infected person:

- **Pregnant women:** Pregnant women typically experience only a mild, flu-like illness. However, infections during pregnancy can lead to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.
- **Persons other than pregnant women:** Symptoms, in addition to fever and muscle aches, can include headache, stiff neck, confusion, loss of balance, and convulsions.

Listeriosis can present in different ways depending on the type of infection. Manifestations of listeriosis are host-dependent. In older adults and persons with immunocompromising conditions, septicemia and meningitis are the most common clinical presentations. Pregnant women may experience a mild, flu-like illness followed by fetal loss or bacteremia and meningitis in their newborns. Immunocompetent persons may experience acute febrile gastroenteritis or no symptoms.

#### Clinical Diagnosis

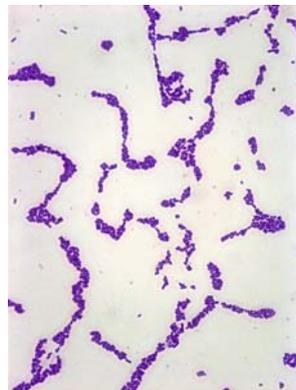
Diagnosis is confirmed only after isolation of *Listeria monocytogenes* from a normally sterile site, such as blood, or from amniotic fluid or the placenta in the setting of pregnancy. *L. monocytogenes* can be isolated readily on routine media, but care must be taken to distinguish this organism from other Gram-positive rods, particularly diphtheroids.

Selective enrichment media improve rates of isolation from contaminated specimens. *L. monocytogenes* is a catalase-positive, facultative, gram-positive bacillus. The organism is motile, showing 'tumbling motility' particularly in hanging-drop preparations prepared from overnight broth cultures incubated at 25°C. This greater motility following room temperature incubation is also apparent in semisolid motility medium, where the organism displays a characteristic 'umbrella' of motility near the surface of semi solid motility medium containing 0.2-0.4% agar after incubation at 25°C. The organism is fermentative, producing acid from glucose, and produces acetoin, resulting in a positive Voges-Proskauer reaction.

Microscopically, *Listeria* species appear as small, Gram-positive rods, which are sometimes arranged in short chains. In direct smears they may be coccoid, so they can be mistaken for streptococci. Longer cells may resemble corynebacteria. Flagella are produced at room temperature but not at 37°C. Hemolytic activity on blood agar has been used as a marker to distinguish *Listeria monocytogenes* among other *Listeria* species, but it is not an absolutely definitive criterion.



Selective isolation of *Listeria monocytogenes* on PALCAM Culture media



Gram Stain of *Listeria monocytogenes* demonstrating motility.



Umbrella zone of growth in SIM media,

## Treatment and Prevention

If diagnosed early enough, antibiotic treatment of pregnant women or immunocompromised individuals can prevent serious consequences of the disease. Antibiotics effective against *Listeria* species include ampicillin, vancomycin, ciprofloxacin, linezolid and azithromycin. However, early diagnosis is the exception rather than the rule, since the first signs of a case or an outbreak are reports of stillbirth or serious infections resembling listeriosis. By then, any cohorts who have become infected from eating the same food are likely recovered from an inapparent or flu-type infection, or they themselves may have developed serious disease. However, processed foods known to be the source of *Listeria* that may still be in the market place, restaurant or home should obviously not be used, and recalls should be imperative. It must also be constantly recognized that *L. monocytogenes* is able to grow at low temperatures.

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## References

1. <http://textbookofbacteriology.net/Listeria.html>
2. [www.cdc.gov/listeria/](http://www.cdc.gov/listeria/)

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## Questions

1. Discuss the morphological characteristics of *L. monocytogenes*
  2. Discuss the treatment and prevention of *L. monocytogenes*
  3. Discuss the lab diagnosis of *L. monocytogenes*
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