

Please read this bit 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: **MT00025.**

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.

Cycle 20 Organism 8:

Listeria monocytogenes

Microbiology

Listeria monocytogenes is a small, facultative anaerobe, nonsporulating, catalase positive, oxidase negative Gram-positive bacillus that grows readily on blood agar, producing incomplete beta-haemolysis. The bacilli are short (0.5 to 2 by 0.4 to 0.5µm) that occur singly or in short chains. The organisms are motile at 28°C by means of one to five peritrichous flagella but are much less motile at 37°C. Colonies are small (1 to 2mm). The optimal growth temperature is between 30 and 37°C, growth occurs at 4°C within a few days. Esculin is hydrolyzed in a few hours¹.

Natural habitats

Listeria species are widely distributed in the environment. They have been isolated from soil, decaying vegetable matter, sewage, water, animal feed, fresh and frozen poultry, fresh and processed meats, raw milk and cheese². Listeria monocytogenes has many opportunities to enter food production and processing environments, and because of its ability to grow at 4°C, it can cause disease in persons ingesting colonized food³.

Clinical significance



In nonpregnant adults, *L. monocytogenes* causes primary meningitis, encephalitis, and/or septicaemia. Elderly persons or persons with predisposing conditions that lower the cell-mediated immunity, such as transplants, lymphomas, and AIDS are especially susceptible.

In pregnant woman, *L. monocytogenes* often causes an influenza-like bacteraemic illness that, if not treated, may lead to placentitis and/or amnionitis and infection of the fetus, resulting in abortion, stillbirth because the organism is able to cross the placenta.

Early diagnosis can be made in some cases by detecting *L. monocytogenes* in maternal blood cultures. At birth, the diagnosis is made by detecting the organism in cerebrospinal fluid, blood, amniotic fluid, respiratory specimens of the neonate. Direct microscopic demonstration of Gram-positive bacilli in these specimens is important for an early diagnosis of the disease¹.

Collection of specimens

Laboratory staff should be made aware of the potential risk and be advised to be cautious when working with this organism. Pregnant woman should be particularly careful working in a laboratory where *L. monocytogenes* is propagated or handled. The pathogen is readily isolated from clinical specimens obtained from normally sterile sites (blood, CSF, amniotic fluid or fetal tissue). These specimens should be immediately cultured at 35°C or stored at 4°C⁴.

Isolation procedures

Clinical specimens from sterile sites can be directly plated on blood agar. Specimens obtained from nonsterile sites, foods and environmental sources should be selectively enriched for *Listeria* species before inoculating any culture media¹.

Rapid detection – commercial kits are available for the rapid detection of *Listeria* species in selective enrichment broths from food samples. These detection methods are usually based on immunoassays that use monoclonal antibodies. These kits are for use in food samples only, and not for analysis of clinical specimens for diagnosis¹.

Treatment

Penicillin or ampicillin with or without an aminoglycoside is usually recommended for the treatment of listeriosis. Trimethoprim-sulfamethoxazole has been used occasionally with success. Cephalosporins are ineffective in vivo, although in vitro tests may indicate susceptibility and should not be used when listeriosis is suspected⁵.

References

1. Allen SD, Emery CL, Lyerly DM. *Listeria*. In Murray PR, ed. Manual of Clinical Microbiology. Washington, DC: ASM Press; 2003: 461-471.
2. Fenlon DR. 1999. *Listeria monocytogenes* in the natural environment, p. 30-40. In ET Ryser and EH Marth (ed), *Listeria, Listeriosis, and Food Safety*, 2nd ed. Marcel Dekker, Inc New York, NY.
3. Farber JM, and Peterkin PI. 1991. *Listeria monocytogenes*, a food-borne pathogen. Microbiol Rev. **55**:476-511.
4. Jones GL. (ed.). 1989. Isolation and Identification of *Listeria monocytogenes*. Centers for Disease Control, Atlanta, Ga.
5. Hof H, *et al.* 1997. Management of listeriosis. Clin Microbiol Rev. **10**:345-357.

Questions

1. How would you differentiate between the genera *Listeria* and *Erysipelthrix*?
2. How would you isolate *Listeria monocytogenes*?
3. What characteristics are used to identify *Listeria monocytogenes*?
4. What infections are caused by *Listeria monocytogenes*?