

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 22 Organism 12:

Listeria monocytogenes

Listeria monocytogenes is a Gram-positive rod-shaped bacterium. 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. (Indeed, as Gram-positive, non-sporeforming, catalase-positive rods, the genus *Listeria* was classified in the family Corynebacteriaceae through the seventh edition of Bergey's Manual). 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. Further biochemical characterization may be necessary to distinguish between the different *Listeria* species.

Until about 1960, *Listeria monocytogenes* was thought to be associated almost exclusively with infections in animals, and less frequently in humans. However, in the last 30 years, listeriae, including the pathogenic species *L. monocytogenes* and *L. ivanovii* have been isolated from a variety of sources, and they are now recognized to be widely distributed in Nature. In addition to humans, at least 42 species of wild and domestic mammals and 17 avian species, including domestic and game fowl, can harbor listeriae. *Listeria monocytogenes* is reportedly carried in the intestinal tract of 5-10% of the human population without any apparent symptoms of disease. Listeriae have also been isolated from crustaceans, fish, oysters, ticks, and flies.

The true incidence of listeriosis in humans is not known, because in the average healthy adult, infections are usually asymptomatic, or at most produce a mild influenza-like disease. Clinical features range from mild influenza-like symptoms to meningitis and/or meningoencephalitis. Illness is most likely to occur in pregnant women, neonates, the elderly and immunocompromised individuals, but apparently healthy individuals may also be affected. In the serious (overt) form of the disease, meningitis, frequently accompanied by septicemia, is the most commonly encountered disease manifestation. In pregnant women, however, even though the most usual symptom is a mild influenza-like illness without meningitis, infection of the fetus is extremely common and can lead to abortion, stillbirth, or delivery of an acutely ill infant.

Listeria monocytogenes is presumably ingested with raw, contaminated food. An invasins secreted by the pathogenic bacteria enables the listeriae to penetrate host cells of the epithelial lining. The bacterium is widely distributed so this event may occur frequently. Normally, the immune system eliminates the infection before it spreads. Adults with no history of listeriosis have T lymphocytes primed specifically by *Listeria* antigens. However, if the immune system is compromised, systemic disease may develop. *Listeria monocytogenes* multiplies not only extracellularly but also intracellularly, within macrophages after phagocytosis, or within parenchymal cells, which are entered by induced phagocytosis.

A peculiar property of *L. monocytogenes* that affects its food-borne transmission is the ability to multiply at low temperatures. The bacteria may therefore grow and accumulate in contaminated food stored in the refrigerator. So it is not surprising that listeriosis is usually associated with ingestion of milk, meat or vegetable products that have been held at refrigeration temperatures for a long period of time.

Questions:

1. How would you isolate a *Listeria monocytogenes*?
2. How would you identify a *Listeria monocytogenes*?
3. What are the drugs of choice when treating *Listeria monocytogenes* infections?
4. *Listeria monocytogenes* are intrinsically resistant to what antibiotic/s?

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