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Popular Article

Listeriosis

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Abstract

Listeria monocytogenes is a dangerous infection that can result in listeriosis. After consuming contaminated food, people typically get listeriosis. Pregnant women, infants, elderly persons and those with compromised immune systems are the disease's main targets. Other groups rarely have listeria infection-related illness. For pregnant women, listeriosis often causes a minor illness, but it can be extremely dangerous for the developing foetus or newborn child. Some persons who have listeria infections go on to develop serious infections of the bloodstream (which can lead to sepsis) or brain (which can lead to meningitis or encephalitis), most frequently in adults 65 years of age and older and people with compromised immune systems. Listeria infections can occasionally spread to the bones, joints, and areas of the chest and abdomen. Despite the low occurrence of listeriosis, it has a high mortality rate. Therefore, timely epidemiological investigation and ongoing surveillance are essential for dealing with *L. monocytogenes*.

Keywords: *Listeriosis*, abortions, zoonotic disease, Food borne pathogen.

Introduction

Listeria monocytogenes, a foodborne pathogen, causes listeriosis, an infection with high morbidity and mortality. From self-limited gastroenteritis and spontaneous miscarriage in expectant women to severe invasive infections (sepsis or meningitis) in immunocompromised individuals or people who are extremely old, listeriosis can present clinically in a variety of ways.

Etiology

Genus *Listeria* (group 19)



Listeria monocytogenes-seven serogroups but only 1 and 4 are common. It effects sheep followed by goats and cattle

First epizootic outbreak (1924) in England (Lab rabbits) characterized by mononucleosis from which the name came.

Listeria ivanovii- affects only animals(abortions) rarely effects man

Gram positive, rod shaped, non-capsulated and non-sporulated, motile, facultative anaerobic. Optimum temperature-30-37⁰C (but grows at 3-5⁰C).

Host range and reservoirs:

The host range of *L. monocytogenes* includes a variety of mammals and birds, crustaceans, ticks and fishes and the pathogen has been reported to infect nearly all domestic animals like buffalo, cattle, sheep, goat, pig. It also effects guinea pig, mice, minks, chinchilla, dog and wild animals. Since the organism is common in nature, the environment serves as the natural habitat for all *Listeria* spp., including *L. monocytogenes*. The organisms have been isolated from surface oils, decaying plants, sewage sludge, pasture plants, silage, manufacturing effluents and river waters. It is believed that chickens are both the primary reservoir and the disease's carrier.

Sources and transmission

In animals:

- Consumption of infected raw/unpasteurized milk, cheese, meat.
- Direct contact with sick animals, healthy carriers, aborted foetus, placenta
- Inhalation
- Vertical transmission (In utero or through birth canal)
- Nosocomial infection

In man:

- Animals have been thought to become infected by *L. monocytogenes*-contaminated silage.
- Contaminated feed, water with faeces, saliva, nasal secretions, milk or aborted material.

Symptoms

Animals

The term "circling disease," derived from the word "encephalitis," refers to a condition that affects sheep and goats and is characterised by dullness, a unilateral facial nerve paralysis that causes the eyelid and ear to drop, as well as drooling due to partial pharyngeal paralysis. It is acute in sheep and goats but chronic in cattle. During the last stage, the animal leans down and performs chewing



motions to try and feed. Septicaemia is more common in young animals. Abortion during last months of gestation. Complications are macerated foetus, retained placenta. It also causes mastitis, with pyrexia, profuse diarrhoea. In swine meningoencephalitis and shows dyspnoea, cough and abortion. In birds septicaemic form is common with degenerative lesions of myocardium, pericarditis, focal hepatic necrosis, meningoencephalitic form is rare with torticollis.

Man

I.P- 4 to 21 days

Meningitis/encephalitis characterized by high temperature, stiffness of neck, ataxia, tremors, seizures, fluctuating consciousness.

Septicaemia, abortion in pregnant women, still birth or infection of new born. In new born it is disseminated granulomatosis.

Minor skin infections particularly in farmers, veterinarians after handling calving/ abortion. Symptoms like headache, vomiting, fever, malaise, pneumonia, conjunctivitis have also been seen (occuloglandular and granulomatous forms of conjunctivitis).

Diagnosis

- Based on clinical symptoms
- Demonstration of the organisms in smear by Gram's staining, peroxide-anti-peroxide method
- FAT
- Isolation of the pathogen from clinical specimens, such as blood, CSF, mucus from newborns or aborted foetuses and vomitus, faeces, food items, animal feed and vaginal secretions from infected people or animal
- Testing the pathogenicity of *Listeria* isolates using in vitro techniques like the PI-PLC (Phosphatidylinositol-specific phospholipase C activity) assay or in vivo procedures like injecting mice (3-week-old mice) through the intraperitoneal route and injecting 10-day-old chicken embryos through the CAM (chorioallantoic membrane) route
- Detection of soluble antigen in CSF especially in meningitic cases of humans, but it is not reliable
- PCR
- Examination of CSF for any rise in protein concentration and WBC count may be taken as suspected for listeriosis in encephalitic cases of animals



- Serodiagnostic procedures like the Widal test, CFT, haemagglutination test, haemagglutination inhibition test, antibody precipitation test and growth inhibition test; According to recent reports, the diagnosis of both the septicaemic and abortion types of listeriosis can be made using the ELISA test for the presence of antibodies against LLO.

Prevention and control

1. Culling of infected animals
2. Use caution when using and preparing silage because the pathogen thrives at pH levels higher than 5, especially when fermentation is unsuccessful and mould growth occurs. Silage should not be fed to animals, especially sheep, if it is a few inches from the front top and sides of a clamp. To prevent excrement from contaminating silage feeds, there should be some sort of physical barrier between the animals and the silage.
3. Immunization. Although a live, attenuated vaccine based on the serovars 1/2a and 4b of *L. monocytogenes* developed in Bulgaria is available in some European countries and claimed to be effective in sheep, the field trial results are conflicting, and there is no experimental model available to test the vaccine's efficacy.

Listeriosis in people can be avoided by exercising caution when managing both human and animal abortion cases, avoiding consuming tainted food and avoiding cross-infections, especially among young children in hospitals.

Treatment

The organism consistently reacts negatively to a variety of antibiotics. It is advised to take antibiotics with an aminoglycoside, trimethoprim, sulphamethoxazole, tetracyclines, ampicillin and amoxicillin. However, because to its ability to enter the CSF, ampicillin is the medication of choice in encephalitis cases. Ampicillin has a powerful bactericidal action when combined with gentamicin and it is favoured in patients with compromised defence mechanisms. In the early stages of keratoconjunctivitis and iritis, subconjunctival injections of corticosteroids and antibiotics have been found to be particularly beneficial.

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