

# Listeria Monocytogens Bacteremia- A Rare Case Report

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## I. INTRODUCTION

*Listeria monocytogenes*, a facultative anaerobic, gram-positive, rod-shaped bacterial pathogen is commonly found in foods such as cold deli meats and unpasteurized dairy products. [1], [2], [3], [4]. In 1924, British researchers at Cambridge University isolated the bacteria from the blood of infected rabbits for the first time. It is known to be transmitted feco-orally.

Gastroenteritis, meningitis, and bacteremia are the manifestations, which are particularly fatal in older adults [5], [6]. Early diagnosis and treatment are imperative; however, bacteremia patients present with non-specific symptoms, which make diagnosis and timely management challenging [5].

*L. monocytogenes*' virulence factors include intracellular mobility via actin polymerization and the ability to replicate at refrigerator temperatures. This makes it challenging for food industries to control.

Here, we present a fatal case of listeria monocytogens bacteremia in an elderly female. The case illustrates the fatality associated with listeria infection and the importance of keeping listeria as a differential in elderly patients with gram positive bacteremia.

## II. CASE REPORT

We present the case of a 96 years old female with a past medical history of hypertension, on lisinopril, nebivolol and nefedipine for the same, stroke, and dementia, who was found down in her driveway, with an unknown downtime. Patient lived by herself, was a never smoker or alcohol user. Her last known normal was 24 hours before the presentation, where she was noted to be confused and complained of some shortness of breath, but an hour later, she had reported feeling better. On presentation to the emergency department, there were no obvious signs of trauma other than skin tear to the right elbow.

In the ED, on presentation she was noted to be awake, not responding to any questions and was shivering. Patient was hyperthermic with a temperature of 105.2°F, tachycardic with a heart rate of 140bpm, tachypneic with a respiratory rate of 44 and hypertensive with a blood pressure of 182/91mmHg. Labs showed mild leukocytosis with a count of 12100/uL, lactic acidosis of 4.3mmol/L, metabolic acidosis, elevated liver enzymes, elevated CK level of 268U/L, elevated troponin levels. Urine analysis showed moderate blood. Her physical

examination was asymptomatic apart from dry mucous membranes, was noted to be lethargic and confused.

Patient was being admitted and managed in the ICU for metabolic encephalopathy, severe hyperthermia and possible sepsis versus heat stroke/exertion.

Throughout her ICU course, her mentation remained altered. Her Head CT, Abdomen/pelvis CT, Chest Xr, were all negative for any pathologies. Her venous duplex was negative for any deep venous thrombosis. Her echocardiogram showed an ejection fraction of 40%. Ammonia levels were within normal limits, and urine drug screen was negative. She was kept on BiPAP and her ABGs were normal with a Ph of 7.38, PCO2 39.9, PO2 119, bicarb of 21. She was started with IV antibiotics vancomycin and zosyn, cooling blankets, acetaminophen for shivering. Initial preliminary blood cultures were growing gram positive rods. Her COVID-19 test, influenza test, Urine cultures were all negative. She started to experience multiorgan dysfunction including AKI, acute liver injury, and encephalopathy within the next few hours. She developed high anion gap metabolic acidosis and lactic acidosis. At this time, her family decided to make her comfortable and she passed in peace the next day. The final blood cultures showed *Legionella monocytogenes* growth in both bottles of blood culture.

The source of her *Listeria monocytogenes* bacteremia was not identified in this case. This case emphasizes the importance of keeping *Listeria monocytogenes* as a differential cause of altered mental status particularly in extremes of age.

## III. DISCUSSION

*Listeria monocytogenes* is a gram-positive, motile, facultative anaerobe, that is found in broad ecologic niche including soil, water, and vegetation, including raw produce designated for human consumption. Transmission of *L. monocytogenes* can be prevented by avoiding foods commonly contaminated with *L. monocytogenes* and following proper hand-washing technique.

*Listeria monocytogenes* bacteria has a wide array of presentation which includes neonatal meningitis, meningoencephalitis in adults, rhombencephalitis, sepsis (bacteremia) in infants or adults, native or prosthetic valve endocarditis, spontaneous bacterial peritonitis, septic arthritis, biliary tract disease, hepatitis liver abscess, cutaneous infections (in animal workers), endophthalmitis, febrile gastroenteritis, continuous ambulatory peritoneal dialysis peritonitis and osteomyelitis.

Diagnosing *L. monocytogenes* infection typically involves isolating the organism from a sterile site, often blood or cerebrospinal fluid. PCR products such as the HlyA from where direct detection of *L. monocytogenes* bacterium in CSF and other fluids has been studied, but the sensitivity of this method appears low but it might be beneficial in situations with negative cultures where the patients were already on antibiotic treatments.[8][9]

*Listeria monocytogenes* bacteremia without central nervous system involvement, is a rare clinical manifestation of the bacteria infection. Not much reported cases are found in literature. It represents about one-third of adult cases of invasive listeriosis.

The symptoms typically involve fever, chills, and other septic signs, though they are not specific. Analysis of their hemodynamic status and resuscitation as needed should be done on initial presentation. *Listeria* sepsis almost always occurs in adult non-pregnant patients with malignancy, organ transplant, or other immunocompromised states. The mortality rate is about 25-30% in these adults.

If meningitis is suspected, obtaining blood cultures, lumbar puncture, antibiotics, CT scan of head should be considered.

Intravenous (IV) ampicillin or penicillin G is the antibiotic of choice to treat *L. monocytogenes* bacteremia. Trimethoprim-sulfamethoxazole is an alternative in cases with penicillin allergy.[4] *L. monocytogenes* is found to be resistant to all cephalosporin antibiotics. It is important to keep this in mind as newer cephalosporins are commonly used for the treatment of nonspecific sepsis syndromes or for the empiric treatment of bacterial meningitis, causing delay in specific therapy for listeriosis.

The FDA has approved a variety of different food additives including bacteriophage (*Listeria* Phage P100) sprays to prevent the spread of *L. monocytogenes*. *L. monocytogenes* is eliminated by a bacteriophage virus in the spray. The spray would be primarily utilized on deli meats and cheeses.[7]

#### IV. CONCLUSION

*Listeria monocytogenes* bacteremia is a rare manifestation of the bacteria. It is important to keep it as a differential,

especially in extremes of age and immunocompromised patients, as the presentation is similar to the common septic bacteria but the management is different.

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