

## Listeria monocytogenes Infection in a 69-year-old Diabetic

Faraz Yousefian, DO<sup>1,3\*</sup>, Francesca Genera<sup>2</sup>; Matin Soeizi, MD<sup>4</sup>, Victoria O'Neill<sup>2</sup>; Christian Dupuy<sup>2</sup>; Bernard Hildebrand MD<sup>2,3</sup>; Manuel Estrada MD<sup>2,3</sup>

<sup>1</sup>Center for Clinical and Cosmetic Research, Aventura, Florida, USA.

<sup>2</sup>University of the Incarnate Word School of Osteopathic Medicine, San Antonio, Texas, USA.

<sup>3</sup>Texas Institute for Graduate Medical Education and Research- Internal Medicine Department- San Antonio, Texas, USA.

<sup>4</sup>Brooklyn Hospital Center, Brooklyn, New York, USA.

**Received Date** : Aug 24, 2022  
**Accepted Date** : Sep 21, 2022  
**Published Date** : Sep 29, 2022  
**Archived** : [www.jcmimagescasereports.org](http://www.jcmimagescasereports.org)  
**Copyright** : © Faraz Yousefian 2022

**\*Corresponding Author:** Faraz Yousefian, Center for Clinical and Cosmetic Research, Aventura, Florida, USA.  
Email: [yousefia@uiwtx.edu](mailto:yousefia@uiwtx.edu)

### Abstract

*Listeria monocytogenes* is a gram-positive, rod-shaped facultative anaerobe, often misidentified with Diphtheroids due to sharing similar characteristics. Due to its virulence factor listeriolysin O, it is capable of evading host immune systems and living in extreme environments. This organism often causes listeriosis in pregnant women, newborns, the elderly, or immunocompromised individuals. Therefore, it is crucial to include listeria infection in patients with positive diphtheroids in blood or CSF. We discuss a case of a 69-year-old Hispanic woman with a history of type 2 diabetes mellitus, hypertension, seizure disorder, and obesity who presented with generalized body aches and fever. Initial blood culture showed diphtheroid on blood culture. In order to distinguish listeria from diphtheroids, longer blood culture inoculation is required. After 48 hours of inoculation, blood culture resulted in *L. monocytogenes* as the culprit of the patient's symptoms, contributing to the complex nature of distinguishing between diphtheroid and listeriosis. Therapy was modified to ampicillin at this time. Following antibiotic treatment and negative blood culture, the patient fully recovered from the listeriosis without suspicion of having symptoms of endocarditis and meningitis.

**Keywords:** Listeria monocytogenes, infection, bacteria, diabetes, diphtheroid

### Introduction

*Listeria monocytogenes* is a ubiquitous, gram-positive, facultative anaerobic, rod-shaped bacterium with virulence factors that enable its bacterial resistance to heat, drying, freezing, and extreme environments. These factors contribute to its ability to cause invasive listeriosis, which can encompass bacteremia, neurolisteriosis, meningitis, and maternal-neonatal listeriosis [5]. *L. monocytogenes* is one of eight food-borne pathogens monitored by the CDC. Amongst the eight, listeriosis has the lowest overall incidence of 0.3 per 100,000 population but is the third most deadly, specifically due to invasive *Listeria monocytogenes* gastroenteritis with an average fatality rate of 20% [1]. Individuals at high risk for invasive listeriosis include pregnant women, immunosuppressed individuals, and adults over the age of 65 [1]. Independent risk factors for mortality associated with invasive listeriosis include cancer, diabetes mellitus, multi-organ failure, previous diagnosis of monocytopenia, alcohol abuse, corticosteroid usage, chronic lung disease, and

chronic kidney disease [6]. Delayed diagnosis and initiation of therapy are also associated with a higher mortality rate [6].

*Listeria monocytogenes* is acquired by ingestion, transplacental translocation, or vertical transmission from mother to child by vaginal delivery, and is most associated with a self-limiting, acute febrile gastroenteritis in immunocompetent individuals [1]. Listeria gastroenteritis typically develops within 24 hours of pathogen ingestion, and patients present with fever, watery diarrhea, nausea, vomiting, and joint or muscle pain. Listeria bacteremia may manifest with fever, chills, antecedent diarrhea, tachycardia, elevated CRP, and procalcitonin. Bacteremia may progress to septic shock, meningoenzephalitis, cerebritis, septic arthritis, and osteomyelitis [6]. Listeria bacteremia is associated with a three-month mortality rate of 46% [6]. In septic patients or patients with positive diphtheroids, Listeria should be included as a differential due to its high mortality rate. When evaluating a patient with sepsis, *L. monocytogenes* should be included in the differential diagnosis.

**Citation:** Faraz Yousefian. *Listeria monocytogenes* Infection in a 69-year-old Diabetic. J Clin Med Img Case Rep. 2022; 2(5): 1253.

## Case report

A 69-year-old Hispanic female with a past medical history of type 2 diabetes mellitus, hypertension, seizure disorder, and obesity was admitted to the hospital with generalized body aches and fever for the preceding two days. She denied chest pain, shortness of breath, diarrhea, vomiting, constipation, recent travel, sick contacts, consumption of new or exotic foods, or utilizing any new medications. She stated she was nonadherent with prescribed medications due to financial difficulties. A recent hemoglobin A1C was 10.3% (reference range of 5.7%-6.4%).

The patient's heart rate was 97 beats per minute with a temperature of 38.6°C. The patient's white blood cell count was 17 white blood cells per microliter (reference range of 4.5 to 11.0  $\times 10^9$ /L). Physical examination, including neurologic and cardiac exams revealed no abnormalities or findings of suspicion. Initial blood cultures grew diphtheroid and the patient was started on trimethoprim/sulfamethoxazole 450mg IV every six hours. The 48 hour blood culture inoculation revealed *Listeria monocytogenes* and therapy was changed to ampicillin 2g IV every four hours for fourteen days. Following antibiotic treatment and negative blood culture, the patient fully recovered from the listeriosis without suspicion of having symptoms of endocarditis and meningitis.

## Discussion

Typically found in cold environments, *Listeria monocytogenes* is a common cause of sepsis, endocarditis, and meningitis in immunocompromised patients with a 27% fatality rate [6]. Diagnosing listeriosis can be difficult, as it relies on a time-consuming bacteriological analysis to distinguish listeria from other similar organisms such as diphtheroid, enterococci, and diplococci. Contrasting other organisms, *Listeria* will manifest with tumbling motility. When diphtheroids are identified on blood culture analysis, continued suspicion and evaluation for listeriosis are required due to high mortality rate[3]. In healthy individuals, *Listeria monocytogenes* can cause self-limited gastroenteritis; however, more serious illnesses should be considered in patients with altered or diminished immune responses as with our patient with uncontrolled diabetes. Patients with positive listeria blood cultures require treatment with ampicillin, and meningitis and endocarditis should be ruled out due to associated high mortality rates.

In 2011, the New South Wales Health Department reported 21 cases of listeriosis and revealed that 61% of patients were over the age of 65 [2]. A 2006 study analyzed thirty patients suffering from *L. monocytogenes* meningitis. Of these thirty patients, all were either over the age of 50 or immunocompromised in some way [4]. Unlike other instances of listeriosis, our patient uniquely had uncontrolled type 2 diabetes mellitus, breaking the typical mold of only newborns, the elderly,

and the immunocompromised being susceptible to *Listeria*. Additionally, the patient's initial culture finding of diphtheroid raises suspicion over how often a diagnosis of listeriosis is missed due to lack of additional clinical and laboratory evaluation. Further investigation should be conducted into ways to distinguish between diphtheroid and listeriosis.

**Funding sources:** None

**Consent statement:** Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy

**Conflicts of Interest:** None declared

## References

- Allerberger F, Wagner M. Listeriosis: a resurgent foodborne infection, *Clinical Microbiology and Infection*. 2010; 16(1): 16-23. <https://doi.org/10.1111/j.1469-0691.2009.03109.x>.
- Chavada R, Keighley C, Quadri S. et al. Uncommon manifestations of *Listeria monocytogenes* infection. *BMC Infect Dis*. 2014; 14: 641. <https://doi.org/10.1186/s12879-014-0641-x>
- Corynebacterium, *Listeria*, and *Bacillus*. In: Ryan KJ, Ray C. eds. *Sherris Medical Microbiology*, 6e. McGraw Hill; 2014. Accessed June 18, 2022. <https://accessmedicine.mhmedical.com/content.aspx?bookid=1020&sectionid=56968768>
- Matthijs C, Brouwer, Diederik van de Beek, Sebastiaan GB. Heckenberg, Lodewijk Spanjaard, Jan de Gans, Community-Acquired *Listeria monocytogenes* Meningitis in Adults. *Clinical Infectious Diseases*. 2006; 43(10): 1233-1238, <https://doi.org/10.1086/508462>
- Uta Gasanov, Denise Hughes, Philip M. Hansbro. Methods for the isolation and identification of *Listeria* spp. and *Listeria monocytogenes*: a review, *FEMS Microbiology Reviews*. 2005; 29(5):851-875, <https://doi.org/10.1016/j.femsre.2004.12.002>
- Vallejo Pedro, Cilla Gustavo, López-Olaizola Maddi, Vicente Diego, Marimón José María. Epidemiology and Clinical Features of Listeriosis in Gipuzkoa, Spain, 2010–2020. *Frontiers in Microbiology*. 2022; 13. <https://doi.org/10.3389/fmicb.2022.894334>