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Nocardia farcinica: No Farce Bacteremia

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Introduction

- *Nocardia* species are gram-positive, aerobic, partially acid-fast organisms, with a beaded branching growth pattern
- *Nocardia* are opportunistic bacteria, acquired either through inhalation of airborne spores or direct skin inoculation
- Typically, they affect patients with neoplasms, solid organ and hematopoietic stem cell transplant on immunosuppression, HIV infection, and long-term steroid use (1)
- Here we present a case of *Nocardia* bacteremia with systemic nocardiosis, in an HIV/AIDS patient

Case

- A 48 year-old African American man with a history of HIV presented to the ED with worsening cough, shortness of breath, generalized weakness and fatigue over the past two months. The patient had not been on any HIV therapy for two years due to medication cost. On arrival, he was in septic shock with hypotension, tachycardia and leukocytosis. Diagnostic workup showed a WBC of 13 K/uL, hypokalemia (2.5mmol/L) and a CD 4 count less than 5 cells/uL. A detailed physical exam showed an ill-appearing, cachectic man, with bilateral scleral icterus, diffuse expiratory wheezes and skin lesions in several stages on his upper extremities, shins and back, along with a left axillary abscess.
- CXR revealed a left lower lobe pneumonia. Cultures from sputum, axillary abscess and blood were positive for *Nocardia farcinica*. A diagnosis of community acquired pneumonia was made.
- He was immediately treated with IV Cefepime, Vancomycin and Azithromycin, in addition to intravenous potassium replacement and fluids for sepsis.
- He was transferred to another hospital due to his insurance coverage. There, he was started on antiretroviral therapy with Stribild, and was discharged on one month course of Amikacin and Bactrim.

Blood Pressure

98/66 mmHg

Heart Rate

107 bpm

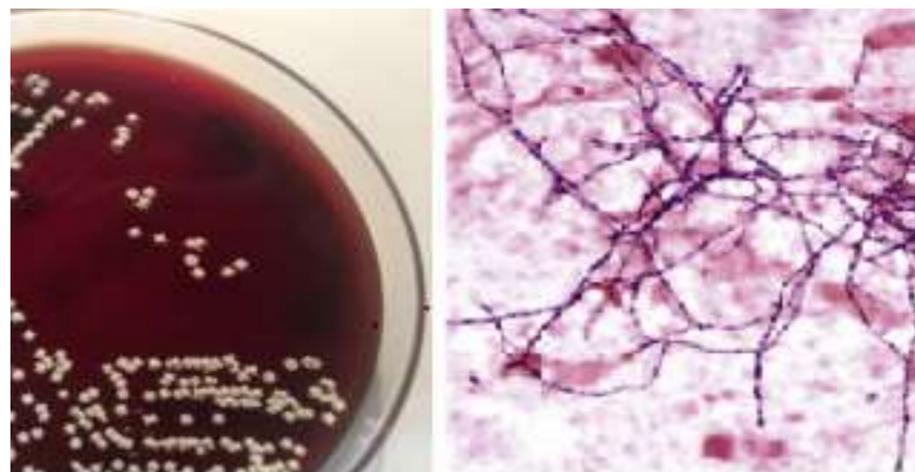


Figure 1. (Right) Gram stain of *Nocardia* in expectorated sputum. *Nocardia* spp. grow as beaded, branching, filamentous Gram-positive rods. Image from *Medical Microbiol. Murray, Jan.2021*
(Left) Colony morphology of *N. brasiliensis* in blood agar. Image from *Dermatology (Actas Dermo-Sifiliográficas, English Edition), Vol. 110 Redondo Sept.2019*



Figure 2. Mycetoma of the foot with discharging sinus. Image from *J of Clinical and Experimental Dermatology, Verma 2019*

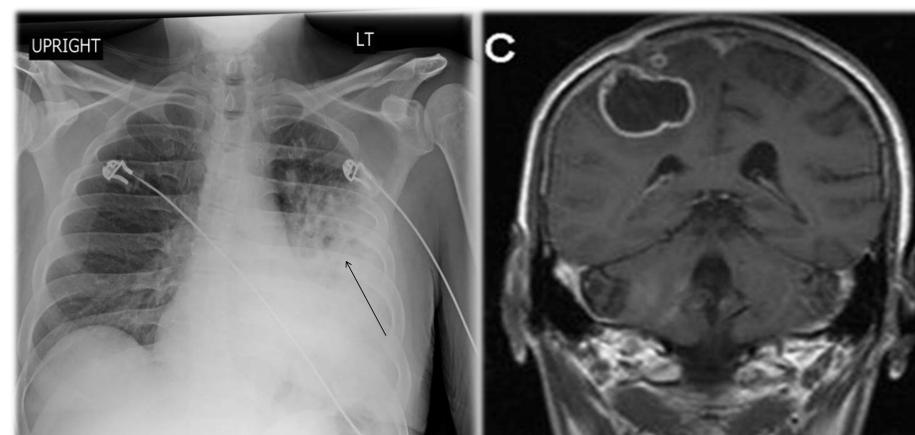


Figure 3. (Left) Patient CXR: Frontal view of the chest – left lower lobe consolidation and pleural effusion .
(Right) Coronal T1-weighted MRI showing *N. farcinica* brain abscess in immunocompetent host.
Image from *J of Clin Neuroscience Vol.16 Chung Dec.2009*

Discussion

- *Nocardia* species are distributed widely in nature, commonly found in soil, dust, decomposing vegetation, salt and fresh water
- The most common *Nocardia* spp. responsible for infections in human are *N. asteroides* (80 -90%), followed by *N. brasiliensis*, *N. farcinica* and *N. nova*
- Of all the nocardiosis cases, 22-39% patients are immunocompetent (1)
- Brain imaging is important because nocardiosis tends to disseminate to the central nervous system
- Nocardiosis also affects the lungs, with skin, soft tissue and pleura, less commonly involved (2)
- Mycetomas, presenting as hard skin swelling, painless sinuses and grains, are classic skin and subcutaneous infections caused by *Nocardia* spp. (3)
- *Nocardia farcinica* is known to be multi-drug resistant and more prone to dissemination
- AIDS patients with a CD4 count <200 and those not on HAART or Bactrim for PCP prophylaxis are at higher risk for dissemination
- *Nocardia* bacteremia, in conjunction with disseminated disease, has a 50% mortality rate, making early treatment crucial
- The median total duration of treatment is 75 days with sulfonamide-based antibiotics ie bactrim followed by carbapenems (4)

Conclusion

- *Nocardia* spp. can cause localized or disseminated diseases
- In immunocompromised patients, the lungs are mainly affected
- *Nocardia* bacteremia with disseminated disease is rare but has a high mortality rate

Sample Bibliography

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