Disseminated Nocardiosis in an Advanced AIDS Patient

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Abstract
Nocardiosis is often misdiagnosed as tuberculosis in patients with HIV, as both diseases have similar manifestations. We describe the successful management of a case of advanced AIDS with disseminated Nocardial infection due to \textit{N. asteroides}. Nocardial infection needs to be suspected in a patient with HIV infection when there is chest radiographic abnormality and when thrice sputum microscopy for acid fast bacilli is negative.

Introduction
\textit{Nocardia} is a gram positive actinomycete that is found worldwide in soil and decaying organic matter.\textit{Nocardia asteroides} is the commonest species isolated from clinical specimens. Human infection is rare and contracted through inhalation.\textit{N} It is more common among immuno compromised patients, especially those with impaired cell mediated immunity. It has been reported in patients receiving cancer chemotherapy, corticosteroids, and post transplant patients and in advanced HIV patients. The incidence of Nocardial infection in patients with AIDS is 0.1% to 0.3 \%.\textit{1}

Case Study
A 45 year old man presented to the emergency medicine department of our hospital with history of fever of 4 months duration, and seizures and right sided weakness of one month duration. He received anti tuberculosis treatment for prolonged fever and opacity on chest radiograph before coming to our hospital elsewhere with no response. There was no past history of diabetes, hypertension or valvular heart disease. At admission clinical examination by the neurosurgeon revealed the patient was confused with right hemiparesis with 2/5 power. Contrast enhanced CT scan of the brain which was done in the emergency room showed a large space occupying lesion with uniform, thick wall suggestive of an abscess in the left parietal region with mass effect on ipsilateral ventricle causing midline shift to the right (Fig. 1). He was immediately wheeled to the operation theatre and drainage of abscess was performed. Twenty five ml of thick pus was drained under general anesthesia. Intravenous ceftriaxone was started. The aspirate was submitted to Microbiology laboratory for further processing of the causative organism.

Microbiology Processing: Microscopy of the pus showed thin branching gram positive filaments resembling an Actinomycete. A 1% acid fast stain showed Acid fast branching filaments, suggestive of \textit{Nocardia} species. Culture of the pus grew \textit{Nocardia} species after 48 hours on 5% sheep blood agar, which was further identified biochemically as \textit{N. asteroides}.

At this time, general medicine department opinion was sought. Detailed clinical examination by a consulting Physician revealed that the patient was pale, emaciated and tachypnoeic. Severe oral thrush and coarse crepitations were heard on both sides of the chest. The right hemiparesis with 2/5 power in the upper and lower extremities persisted. In view of the above clinical picture, and nocardia brain abscess an underlying immunocompromised state was suspected. Even though there was a report of HIV which is non-reactive available in the patients' records, HIV ELISA was again requested after discussing with patients close relatives. He was found reactive for anti HIV antibodies. HIV 1 infection was confirmed by western blot. On further investigations fasting blood sugar was found to be 76mg/dl, there was mild normocytic normochromic anemia, liver and renal function tests were normal. Chest x-ray revealed left perihilar opacity (Fig. 2). 2D Echocardiogram was normal and did not reveal any vegetation. The CD4 count done by FACS count (Becton Dickinson, USA) was 18 cells/µl.

With a clinical diagnosis of AIDS related illness and associated opportunistic infection due to Disseminated Nocardial infection involving lung and brain, Ceftriaxone 2Gm IV once a day was continued for 2 weeks along with cotrimoxazole (SMX 3200mg + TMP 640mg/day) in two divided doses for 12 months. To avoid immune reconstitution and inflammatory syndrome Antiretroviral therapy with Zidovudine (300mg BD), Lamivudine (150mg BD), and Efavirenz (600mg OD) was started 2 weeks following ceftriaxone. On follow up he developed stavudine induced neuropathy and Zidovudine induced anemia and. He was switched to Tenofovir, Emtricitabine and Efavirenz .Patient is under regular follow-up and completed 1year of cotrimoxazole and is doing well after 24 months follow up and adheres to the recommended ART and antiepileptic agents.
Discussion

Infections due to Nocardia are acquired due to exposure to contaminated soil. Infection usually occurs through inhalation or direct cutaneous inoculation. More than 70% of patients with nocardial infection are immunocompromised. Disseminated Nocardiosis is associated with several immunocompromising conditions such as organ transplant, cytotoxic therapy, lymphoproliferative syndrome and prolonged corticosteroid therapy.1 More recently, HIV infection has been described as a risk factor for disseminated Nocardiosis. These infections affect patients in advanced stages of HIV disease with CD4 cell counts below 100 cell/µl. The incidence of Nocardial infections in HIV is low, and may be due to extensive use of cotrimoxazole for Pneumocystis carinii pneumonia prophylaxis.3

This patient was treated initially empirically for the pulmonary symptoms with antituberculosis treatment before coming to our hospital with no response. The radiographic picture of pulmonary nocardiosis in patients with AIDS is variable; however, the possibility of Nocardia should be kept in mind in HIV-positive patients with subacute infection and an atypical radiographic lesion.4 The lungs are the primary sites of nocardial infection in more than 2/3 of cases. Unless Nocardial infection is proven by microscopy and culture of the sputum, most often the pulmonary infection is mistaken for tuberculosis.5 Nocardia species are not normally found in respiratory tract, isolation of Nocardia from sputum is almost always indicative of infection.

Our patient had involvement of lungs and central nervous system. Nocardia have special tropism for neural tissue and the most common site of dissemination is the brain.7 Dissemination is by hemogenous spread. CNS infection occurs in more than 40% of cases of systemic Nocardiosis.3 In CNS infections, brain abscesses are usually supratentorial. CNS infection is indolent in course. Hallmark of CNS Nocardiosis is formation of a parenchymal abscess. Cranietomy and excision are usually needed. Prognosis depends on the rapidity with which the diagnosis is established. The treatment of choice for Nocardiosis is sulphonamides. Minocycline has been recommended for treating patients with sulphonamide hypersensitivity. Other drugs which may have in vitro activity against Nocardia are Cycloserine, Clindamycin, Ampicillin, Amikacin, Cephalosporins and Carbapenems.7

Conclusions

A high index of suspicion is required to diagnose Nocardial infection as the clinical presentation and radiographic features mimic tuberculosis. Nocardiosis should be considered in HIV/AIDS patients especially when sputum is negative for AFB or when patient is not responding to empiric ATT. This case also emphasizes the need for brain tissue sampling in patients with CNS involvement in view of the multiple etiologies of brain abscesses in patients with immunosuppression.

References