American Journal of Medical Case Reports, 2023, Vol. 11, No. 6, 107-109
Available online at http://pubs.sciepub.com/ajmcr/11/6/1
Published by Science and Education Publishing
DOI:10.12691/ajmcr-11-6-1

Case Report on Pulmonary Nocardiosis inImmunocompetent Patient

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Received May 20, 2023; Revised June 22, 2023; Accepted June 30, 2023

Abstract INTRODUCTION: Pulmonary nocardiosis is defined as pneumonia caused by Genus Nocardia (aerobic actinomycetes). Nocardiosis, caused by Gram-positive, weakly acid-fast, filamentous aerobic actinomycetes, is an opportunistic infection and remains as a possible cause of pulmonary and systemic infection in immunocompromised patients It is a rare condition in an immune-competent patients. METHODS: A prospective observational study was conducted in Aster CMI Hospital, Bengaluru. We prospectively examined the demographics, treatment related variables (including complications) and outcomes. RESULT: A 70-year-old female patient, experienced with a cough with expectoration, dyspnea, weight loss and recurrent sharp rise in body temperature. The diagnosis of nocardiosis is done by microscopic tests like Broncho alveolar lavage fluid and revealed filamentous Gram-positive bacteria Broncho alveolar lavage fluid aerobic culture showed Nocardia species. The patient was treated with Cotrimoxazole and Imipenem. The patient ameliorate both clinically and radiographically.

Keywords: *pulmonary nocardiosis, immunocompetent*

Cite This Article: Brunda MS, Shyma Shaji, Vandana AM, and Sivanesh Sekar, "Case Report on Pulmonary Nocardiosis in Immunocompetent Patient." *American Journal of Medical Case Reports*, vol. 11, no. 6 (2023): 107-109. doi: 10.12691/ajmcr-11-6-1.

1. Introduction

Nocardiosis, caused by Gram-positive, weakly acid-fast, filamentous aerobic actinomycetes, is an opportunistic infection and remains as a possible cause of pulmonary and systemic infection in immunocompromised patients [1]. It also can be isolated in immune-compromised patients without a predisposing factors [2]. *Nocardia* species are commonly found in soil. In general, this infection is addressed by direct inhalation of *Nocardia* species from contaminant soil, and one on one transmission is rare [3]. The common clinical manifestations are dyspnea, productive cough, and fever. Pulmonary nocardiosis is oftenly misdiagnosed with other lung conditions. We report a case of pulmonary nocardiosis that resembled tuberculosis, in a 70-year-old patient without a definable predisposing condition.

2. Case Report

A 70 year aged female patient, who is a farmer by occupation, came with complaints of cough with minimal expectoration for the past 2 years, complaints of Exertional dyspnea for 6 months. History weight loss has been around 5-7 kg in the last 3months. History of recurrent fever present. She does not have any comorbidities. Clinical examination showed coarse crepitations present on both lower zones. Initial investigation shows total count – 7.4, Neutrophil / Lymphocytes – 65.5/ 25.6, Hb-11.2, Platelet- 326, serum Creatinine- 0.66, Sodium- 142, potassium- 4.33. HIV 1 and 2, HbsAg, HCV – Negative. Chest x ray shows - Left cardiac silhouette is lost possibility of left lower zone consolidation.

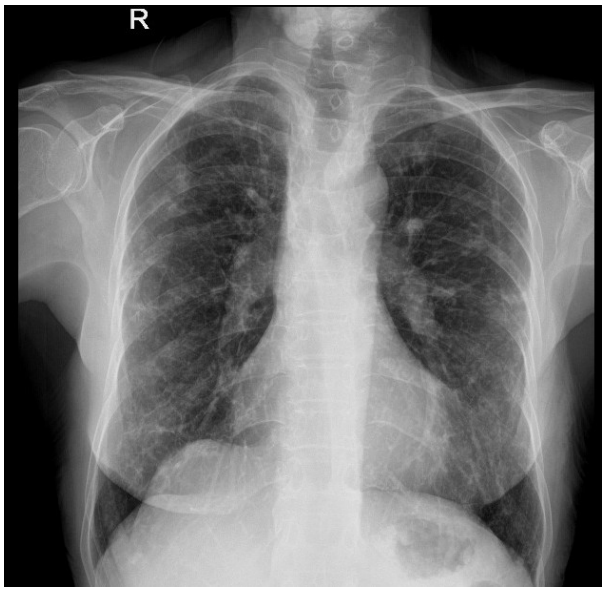

Figure 1.

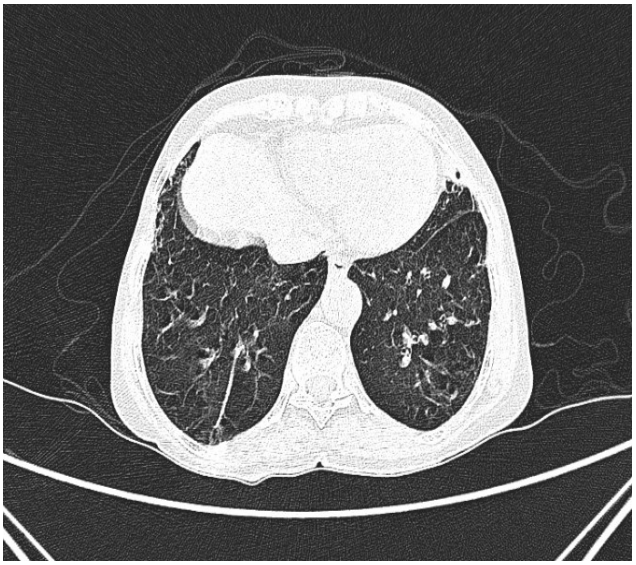

Figure 2a.

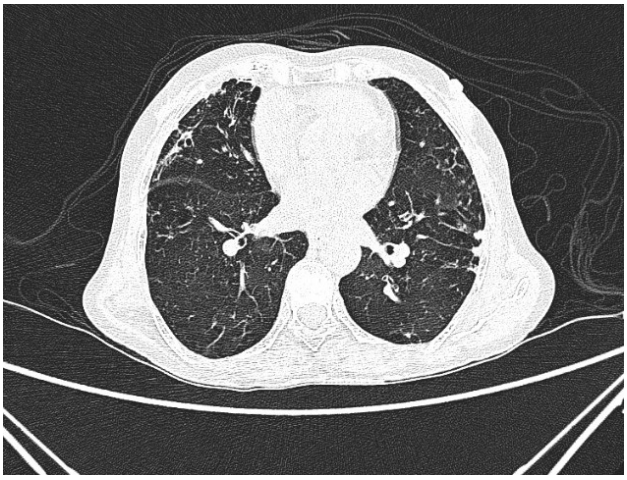

Figure 2b.

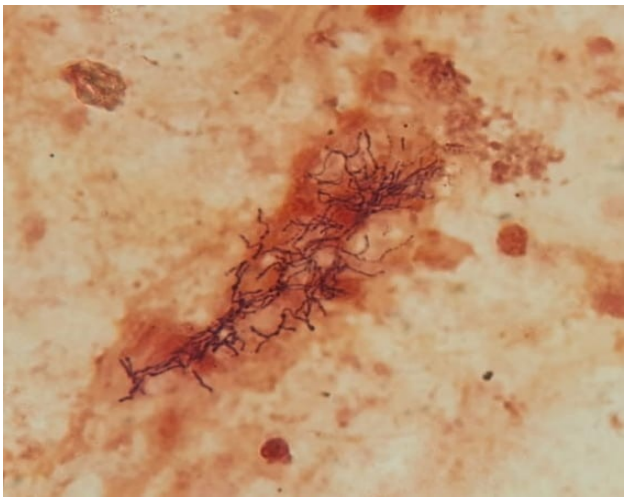

Figure 3.

Fibrotic opacities noted in bilateral lung fields with bulky bilateral hilar shadows. Diaphragmatic hump on right side (Figure 1). HRCT CT chest shows - Mild peribronchial thickening noted in all the lobes of the left lung parenchyma. Multiple centrilobular nodules are noted in both the upper lobes posteriorly, right middle lobe, lingula and superior and posterior basal segments of bilateral lower lobes. Few Small areas of honeycombing/traction bronchiectatic changes are noted in the right middle lobe medially and inferior lingula. Fibro-parenchymal changes with traction bronchiectasis are noted in both the upper lobes posteriorly, medial segment of the right middle lobe and posterobasal segments of bilateral lower lobes. Bilateral apical fibrosis is noted (Figure 2a, Figure 2b). Sputum AFB shows – No acid fast bacilli, sputum culture shows – No Pathogenic Bacteria. She was treated with antibiotics like Cefoperazone + Sulbactam and Azithromycin. But there was no advancement in her respiratory prodrome. The patient then go through bronchoscopy and aspirated material was contrary for tuberculosis, fungi (including Pneumocystis jirovecii), and malignancy. BAL fluid gram stain shows - few Gram positive branching bacilli seen (Figure 3). BAL fluid culture sensitivity shows – Nocardia species, sensitive to Imipenem and Cotrimoxazole. The patient was aided on cotrimoxazole and Imipenem for 3 months. The patient ameliorate both clinically and radiographically.

3. Discussion

Nocardia is a occasional disease spawned by microorganism and it affects the skin, lung and brain. PN defined as pneumonia caused by Genus *Nocardia* (aerobic actinomycetes). Around seven species have been reported to cause disease in human being. *Norcardia. Asteroides* is most common class of organism causing infections (70%) [4], and devitalizing patients have a 45% death rate even with proper treatment. The lesions in this condition are abscesses extensively infiltrated with neutrophils and there will be extensive necrosis, granulation tissue often surrounds the lesions.

Nocardiosis can easily evolve in immunosuppresssed patients, like organ transplant, HIV, Burkitt lymphoma and hypercortisolism [5]. Decrease in cell mediated immunity leads to *Nocardia* infection [6]. Bronchopulmonary can be seen in varied rheumatic diseases, like polyarteritis nodosa, intermittent hydrarthrosis, temporal arteritis, vasculitis, or uveitis, systemic lupus erythematous [7]. Patients with PAP are more prone [8]. Nocardiosis can seen in normal individuals yet detailed IL -12-gamma interferon pathway deficit or other immunologic systems. Amatya et al. have also reported a case of immunocompetent individuals with subcutaneous involvement of *Nocardia* brasiliensis [9]. In our study predisposing factors were observed.

The clinical aspects of PN is changeable and vague with a chronic course [6]. Clinical manifestation can occur in days or weeks. In our case clinical manifestation was presented for two years before admitting to hospital. The patient was presented with chronic cough with productive sputum, low grade fever and weight loss.

The chest radiographic manifestations are pleomorphic and nonspecific. Consolidations and large irregular nodules, often cavitary, are most common; nodules, masses, and interstitial patterns also occur [10]. Upper lobes are more commonly involved [3]. Computed tomography findings include consolidation with or without cavitation, multiple discrete pulmonary nodules, pleural effusion, and chest wall extension.

Since the clinical and radiologic manifestations are nonspecific, and the microbiological diagnosis is often difficult, it seems likely that, in some patients, pulmonary nocardiosis will be off targeted from other infections like TB, bacterial pneumonia, or malignancies. In countries where tuberculosis is very common, antituberculous drugs are started on the base of radiology and clinical manifestation A classic radiographic evidence of TB is not responsing to the therapy and raises the suspicion of other diseases. Kumar et al. reported a case of pulmonary tuberculosis; however in our case the patient was not suffering from pulmonary tuberculosis but was mimicking pulmonary tuberculosis, because of which there was failure to respond to ATT [11]. Similar cases mimicking pulmonary tuberculosis had been reported [12,13].

Delaying of culture report and lack of a serologic test for nocardiosis, leading to difficulty in disgnosis for both immunocompromised and immunocompetent patients in which an pulmonary infection cannot be rapidly diagnosed. In some suspected case, sputum examination will not help to diagnose lesion taken from the body, it need more invasive diagnostic procedures like bronchoscopy, needle aspiration, and open lung biopsy should be performed [11].

The treatment of choice for this condition includes sulphonamides (cotrimaxazole) associated with surgical drainage and other alternative medication include amikacin, imipenem, minocycline, linezolid, and cephalosporins [14]. Therapy must be prolonged over a period of time to prevent relapses. The duration of therapy for nocardiosis depends on the site of infection. For pulmonary involvement, therapy is usually continued for 6 to 12 months or for 2 to 3 months after disease resolution.

This case highlights that pulmonary nocardiosis should be kept in mind in immunocompetent patients, especially in suspected cases of tuberculosis and showing no tubercle bacilli either in the direct smears or cultures.

Abbreviations

PN – Pulmonary nocardiosis, PAP- Pulmonary alveolar proteinosis, IL-interleukins

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