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Pulmonary Nocardiosis in Immunocompetent Patient- A Rare Case Report

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ABSTRACT

Pulmonary nocardiosis is a subacute or chronic necrotizing pneumonia caused by aerobic actinomycetes of the genus Nocardia and rare in immune-competent patients. A 40-year-old female,who presented with dyspnea and episodes of cough with expectoration, fever for last 6 months . The diagnosis of nocardiosis was made by microscopic examination of the sputum sample and revealed filamentous Gram-positive bacteria.

Keywords: Nocardiosis, immunocompetent

INTRODUCTION

Nocardiosis, caused by Gram-positive, weakly acidfast, filamentous aerobic actinomycetes, is an opportunistic infection and remains as a possible cause of pulmonary and systemic infection in immunocompromised patients [1]. But it can be isolated in otherwise immune-competent patients that consisted at least 15% of the infections in patients without a definable predisposing condition [2]. *Nocardia* species are common natural inhabitants of the soil throughout the world.

Pulmonary nocardiosis is usually acquired by direct inhalation of *Nocardia* species from contaminated soil, and person to- person transmission is rare [3]. Pulmonary nocardiosis is difficult to be diagnosed and is often mistaken for other lung diseases. We report a case of pulmonary nocardiosis that resembled tuberculosis, in a 40-year-old patient without a definable predisposing condition.

CASE REPORT

A 40-year-old female presented with dyspnea, episodes of cough with expectoration, fever, for last 6 months. Two months ago she referred to a general physician with low grade fever associated

with productive cough and received some medication without any improvement. Her condition became worsened. Chest X-ray showed infiltrations in bilateral lungs with cavity formation (Figure 1) and computed tomography (CT) picture of a patient showing multiple discrete nodular hypodense lesions of varying sizes in both the lungs fields with evidence of cavitation and air fluid level in most of them with coalescing similar density in left upper lobe and subtle groung glass attenuation around most of the lesion(Figure 2).

Several sputum samples were collected and tested for the presence of acid-fast bacilli, but all smears were negative. The patient then underwent bronchoscopy and aspirated material was negative for tuberculosis, fungi (including Pneumocystis jirovecii), and malignancy. FNAC was done from the left upper lung lesion. Aspirated material was negative for tuberculosis and malignancy.

Patient underwent CT guided FNAC of left upper lung shows sheets of neutrophils mainly admixed with few lymphocytes, an occasional eosinophils and plasma cell against dirty background.few foamy

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macrophages and histiocytes also seen in the smears examined.

Sputum for Modified Ziehl-Neelsen staining showed many filamentous branching acid-fast bacilli, consistent with the morphology of *Nocardia* species (figure 3)

DISCUSSION

Nocardia infection is a rare disorder caused by bacteria, which tends to affect the lung, brain, and skin.

Pulmonary nocardiosis is a subacute or chronic pneumonia caused by a species of the family Nocardiaceae. Seven species have been associated with human disease. N. asteroides is responsible for about 70% of infection caused by these organisms [4], and debilitated patients have a 45% mortality rate even with appropriate therapy. The typical lesions of nocardiosis are abscesses extensively infiltrated with neutrophils. There is usually extensive necrosis; granulation tissue often surrounds the lesions. *Nocardia* infections are rare among normal population. Nocardiosis typically develops in immunocompromised persons, such as those suffering from a lymphoreticular malignancy and Cushing's disease, those with acquired immune deficiency syndrome, those with transplanted organs, and those receiving high-dose corticosteroids [5]. Suppression of cellular immunity appears to play a key role in the establishment of Nocardia infection [6]. Bronchopulmonary or disseminated nocardiosis can occur in various rheumatologic diseases, including SLE, temporal arteritis, polyarthritis nodosa, intermittent hydrarthrosis, vasculitis, or uveitis [7]. Persons with pulmonary alveolar proteinosis are also at increased risk [8]. Nocardiosis can occur in apparently healthy population but further immunologic evaluation particularly detailed interleukin-12-gamma interferon considering pathway deficiency or other immunologic systems may help in diagnosis of these patient's underlying diseases in the future. Amatya et al. have also reported a case of immunocompetent individual with subcutaneous involvement involving Nocardia brasiliensis [9].

In our case any definable predisposing conditions were detected. The clinical presentation of pulmonary nocardiosis is variable and nonspecific with a chronic course [6]. Symptoms usually have been present for days or weeks at presentation. In this case symptoms were present for 6 months before referring to our clinic. The usual symptoms are that of dyspnea, productive cough, and fever. In our case presenting symptoms were those of chronic cough with productive sputum, low grade fever, weakness.

The radiographic chest 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 nonspecific. manifestations are and the microbiological diagnosis is often difficult, it seems likely that, in some patients, pulmonary nocardiosis will be mistaken for other infections, such as tuberculosis, bacterial pneumonia, or malignancies. In countries where tuberculosis is very common, antituberculous drugs are started on basis of radiology and clinical symptoms. A classic radiographic evidence of tuberculosis that is unresponsive to medication raises the suspicion of other diseases. Similar cases mimicking pulmonary tuberculosis had been reported [12, 13] but invasive diagnostic procedures were not needed for diagnosis. Difficulty and slowness of culture growth, along with the lack of a serologic test for nocardiosis, necessitate its inclusion in the differential diagnosis for both immunocompromised and immunocompetent patients in whom an apparent pulmonary infection cannot be rapidly diagnosed. If sputum examinations do not yield the diagnosis in a suspected case and the diagnosis cannot be made easily from lesions elsewhere in the body, more invasive diagnostic procedures like bronchoscopy, needle aspiration, and open lung biopsy should be performed [11].

The treatment of choice for this infection includes sulphonamides and, more recently, trimethoprim and sulphamethoxazole associated with surgical drainage when required but other regimens like amikacin, imipenem, minocycline, linezolid, and cephalosporins are alternatives [14, 15]. Therapy must be prolonged to prevent relapses. The duration of treatment for nocardiosis depends on disease site.For pulmonary involvement, therapy is usually

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continued for 6 to 12 months or for 2 to 3 months after disease resolution[16]. This case highlights that pulmonary nocardiosis should be keep in mind in also immunocompetent patients, especially in suspected cases of tuberculosis not responding to antitubercular therapy and showing no tubercle bacilli either in the direct smears or cultures.



Figure 1- chest xray of the patient showing bilateral infiltrations



Figure 2-computed tomography picture of a patient showing multiple discrete nodular hypodense lesions of varying sizes in both the lungs fields with evidence of cavitation and air fluid level in most of them with coalescing similar density in left upper lobe and subtle groung glass attenuation around most of the lesion.



Figure 3-Modified ZN staining picture of Nocardia.

Conclusion-

Nocardia particularly affects immunocompromised patients, and but in our case it occurs in immunocompetent patient which is rarely reported. So always keep in mind of nocardia if patient present with respiratory symptoms along with bilateral infiltration and cavity radiologically.

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