



**PULMONARY NOCARDIOSIS MISDIAGNOSED AS TUBERCULOSIS IN AN IMMUNO COMPETENT HOST**

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Article Received on 21/10/2021

Article Revised on 11/11/2021

Article Accepted on 01/12/2021

**ABSTRACT**

Pulmonary nocardiosis is an opportunistic infection in an immunocompromised patient; however, often neglected in the immunocompetent patient from the diagnosis considerations. Nocardiosis is a rare bacterial infection that may lead to a severe disease. These infections are rare among normal population and are showing an increasing trend worldwide. Most of these patients present with nonspecific clinical features such as fever, productive cough, and exertional dyspnoea. Nocardiosis is rarely clinically suspected and often diagnosed very late in the course of disease resulting in high mortality. A similar observation was made in one of our case where the patient was being treated on the lines of tuberculosis, and in the end he was diagnosed with disseminated nocardiosis.

**1. INTRODUCTION**

*Nocardia* are classically soil-borne aerobic, Gram-positive, filamentous, weakly acid-fast bacilli causing opportunistic pulmonary infection in immunocompromised individuals. Airborne droplet is the commonest mode of contracting the infection, making lungs the most affected organ. Pulmonary nocardiosis comprises about 70% of all the total cases of nocardiosis. Globally, the data regarding the incidence of *Nocardia* is very limited. It is rarely clinically suspected and often diagnosed very late in the course of disease.

Pulmonary nocardiosis often imitates pulmonary tuberculosis in both clinical presentations and radiological characteristics.<sup>[1]</sup> Consequently, the diagnosis of nocardiosis can be overlooked and treated empirically with anti-tuberculosis regimens; when in fact pulmonary nocardiosis should have been treated.<sup>[2]</sup> Pulmonary nocardiosis is an opportunistic infection in an immunocompromised patient; however, often neglected in the immunocompetent patient from the diagnosis considerations.<sup>[3,4,5]</sup>

Case: A 65-year-old man presented at IGMC Shimla; with chief complaints of fever, pain abdomen and dry cough for 2months. The patient denied any history of diabetes, hypertension, and asthma. At that time, he underwent chest radiography and sputum examination. Te posterior–anterior (PA) view of chest x-ray was suggestive of pulmonary tuberculosis. However, acid-fast bacilli found in two consecutive sputum samples. Later on, the case diagnosed as disseminated tuberculosis. The patient received HRZE for 2 months, in

a government-run tuberculosis center (DOTS). After a subsequent antitubercular therapy for 2 months, the symptoms resumed with similar clinical presentations but this time with worsened cough including hemoptysis and multiple swelling over body. Based on clinical manifestation, radiological features and AFB positive reported on smear microscopy, relapse of pulmonary tuberculosis was assumed. Further, GeneXpert test was done to rule out MDR TB or mutation on genome if present; nevertheless, no MTB complex was detected. On general examination, he was conscious, oriented and well nourished; no clubbing and cervical lymphadenopathy noted.

Investigation: A complete blood count reveals: Haemoglobin: 8.7 gm/ dl; white blood cell (WBC) count: 10,500/mm<sup>3</sup>; platelets 270×10<sup>9</sup>/L; neutrophils: 85%; lymphocytes: 8%; monocytes: 5%; eosinophils: 2; ESR: 90 mm in the first hour. Serological marker (HIV/HBsAg/HCV) and Widal test were negative. Similarly, renal function, liver function, blood glucose were normal. However, Ziehl Neelsen staining of the broncho-alveolar-lavage and pus culture from various swelling over body revealed acid-fast thin branching filamentous organisms suggestive of nocardiosis. Further, identification of the isolate was done with standard microbiological culture methods recommended by American Society for Microbiology.<sup>[6]</sup> In brief, colony morphology (chalky, matt, dry, crumbly, adherent or velvety in appearances; 0.5–1.0 mm in diameter with fine intertwining, branching filaments with delicate aerial hyphae were seen). The antibiotic sensitivity test was performed by Kirby Bauer disc diffusion method following CLSI guidelines.<sup>[7]</sup>

### Treatment

The patient was treated with 2 double strength tablets each containing 800 mg sulfamethoxazole and 160 mg trimethoprim. Fever and cough subsided within 7 days of antimicrobial therapy. The patient recovered well, on medication with 800 mg sulfamethoxazole and 160 mg trimethoprim and was prescribed for 3 months then to follow. The same medication was continued for 12 months, the patient underwent progressive changes and no relapse was noted.

### DISCUSSION AND CONCLUSION

Nocardiosis is an opportunistic infection profoundly affects the immunocompromised patient; however, often neglected in an immunocompetent patient from the diagnosis considerations.<sup>[5,6]</sup> It has been reviewed in a study, that 15% of patients with nocardiosis do not have a predisposing immunosuppressive condition and the figure ranges from 10 to 25% on other studies.<sup>[7,8]</sup> This case underscores, regardless of a patient's immunologic status, the isolation of *Nocardia* from the respiratory tract or other body sources should not be regarded as a contaminant or commensal organism.<sup>[9]</sup> The infection result due to inhalation (pulmonary nocardiosis-pneumonia, lung abscess, and cavitary lesions) or contact with the bacteria via a cut or abraded skin (cutaneous nocardiosis-cellulitis, ulcers); and possibly metastasizes haematogenously into distant organs system (lungs, central nervous system, eyes, kidneys, skin, subcutaneous tissue and bone).<sup>[10]</sup> The clinical syndromes vary and range from pulmonary, disseminated, cutaneous form involving eyes, kidneys, skin, bone, and CNS. The lungs, however, are the most common site of involvement and are affected in 70% of all cases of nocardiosis.<sup>[11]</sup>

Consequently, delay and the high propensity of misdiagnosis may be attributed, as the clinical features—fever, cough, breathlessness, hemoptysis, and weight loss—mimic pulmonary tuberculosis, invasive fungal disease, community-acquired pneumonia, and lung cancer<sup>[12]</sup> presumed relapse cases. This case underscores that pulmonary nocardiosis requires diagnostic considerations if patients' condition exacerbates despite optimum antitubercular therapy or in presumed relapse cases. Regardless of a patient's immunologic status, the isolation of *Nocardia* sps from the respiratory tract or other body sources, should not be overlooked as a contaminant or commensal organism.

#### Availability of data and materials

Data generated or analyzed during this study are included in this published article and remaining are available from the corresponding author on reasonable request.

Consent to publish Written informed consent was taken from the patient for publication of this case.

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