Case Report

Indian Journal of Pathology: Research and Practice
Volume 5 Number 2, May - August 2016
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.5216.29

Pulmonary Nocardiosis: An Unusual Case

Kanthikar Shivraj Nagnath*, Kalshetti Varsha Tukaram**

*Assistant Professor, Department of Pathology, **Associate Professor, Department of Microbiology, ACPM Medical College, Dhule, Maharashtra, India.

Abstract

Nocardiosis is an uncommon but possibly serious pulmonary infection. It typically affects patients with immune suppression or structural lung disease, but can be isolated in immunocompetent patients without a definable predisposing condition. Pulmonary nocardiosis is a rare disease and now a days its incidence is increasing due to increased use of immunosupreseeive therapy and HIV infection. We report a case of nocardiosis in 65 year old female patient clinically diagnosed as chronic obstructive pulmonary disease (COPD) treated with steroids and beta antagonist and anticholinergic drugs. Presented with non-resolving pneumonia and radio-logically mimicking tuberculosis. Sputum analysis revealed Gram positive and acid fast thin beaded and branching filamentous bacteria.

Keywords: Nocardia; COPD; Tuberculosis; Immunosuppression; Immunocompetent.

Introduction

Pulmonary nocardiosis is an acute or suppurative chronic disease occurring in immunocompromised patients mimicking tuberculosis, mycotic infection or malignancy. It is caused by aerobic Actinomycetes of genus Nocardia which is Gram positive, weakly acid-fast, filamentous bacteria [1]. It is rare in immunocompetent patients. Nocardia species are ubiquitous bacteria that are present in the soil, long-standing dust, sand and stagnant water. Pulmonary nocardiosis is usually acquired by direct inhalation of Nocardia species from contaminated soil and person to person transmission is rare [2]. Common predisposing factors for nocardial infection include corticosteroid therapy, chemotherapy for neoplasm and Acquired Immunodeficiency Syndrome (AIDS) [3].

The infection in humans may be self-limiting or sub-clinical or it may progress to an acute, sub-acute or chronic stage. Pulmonary nocardiosis is difficult to be diagnosed and is often mistaken for other lung diseases. It mimics pulmonary tuberculosis both clinically and radio-logically and May a time is wrongly treated with anti-tuberculosis drugs (ATT). We report a case of nocardiosis in a patient with chronic obstructive pulmonary disease (COPD).

Corresponding Author: Shivraj Nagnath Kanthikar, Assistant Professor, Dept of Pathology, ACPM Medical College, Dhule, Maharashtra-424001. India.
E-mail: skanthikar@gmail.com

Case Series

A 65 years old female patient was admitted to the Medicine department with a four months history of cough with purulent sputum, hemoptysis, fever, shortness of breath and chest tightness.

On physical examination, the patient was febrile with body temperature of 101.2°F, pulse rate of 116/min, respiratory rate of 20/min and a blood pressure of 120/80 mmHg. On auscultation bilateral crepitations and rhonchi were audible. Her Hemoglobin (Hb) was 10.6%, Total leukocyte count was 21500/mm [3], differential leucocyte count-neutrophils 82%,lymphocyte 15%,eosinophils 1% and monocytes 2%.Cardiac examination was normal. Chest X-Ray showed bilateral fluffy infiltrates more concentrated in upper zones. Serological tests were negative.

Several sputum samples were collected and tested for the presence of acid-fast bacilli, but all smears were negative but came out to be positive for Nocardia which is weakly acid-fast. On Gram staining the organisms appeared as Gram-positive thin branching filaments. Modified Ziehl-Nelson with 1% sulphuric acid used for the acid-fastness examination. It showed acid fast thin, beaded branching filamentous bacteria consistent with morphology of nocardia species (Figure 1). The patient was started on Trimethoprim-Sulfamethoxazole. The patient improved remarkably both clinically and radiographically.

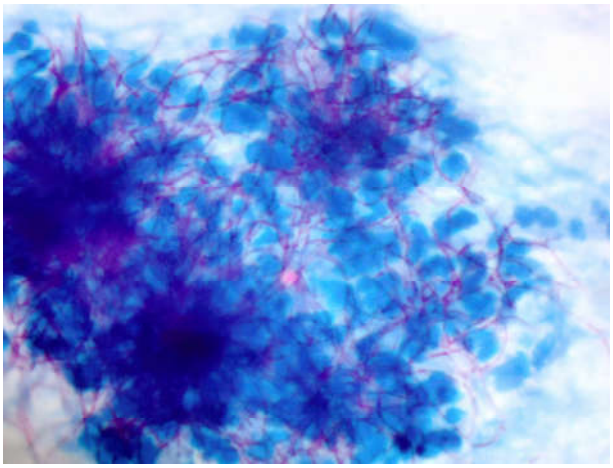

Fig. 1: Modified Z-N staining of sputum showing acid fast beaded and branched filaments of Nocardia (1000X)

Discussion

Nocardiosis is worldwide in distribution. Pulmonary nocardiosis is sub-acute or chronic pneumonia caused by aerobic Actinomycetes of genus Nocardia. It is a rare but serious infection. It is rare among immunocompetent population but mainly affecting immunocompromised with approximately 65 % of cases occurring in individuals with debilitating diseases like lymphoreticular neoplasms, alveolar proteinosis, conditions requiring long term steroid usage, patients with HIV ,intravenous drug abuse, structural lung disease especially chronic obstructive pulmonary disease(COPD),history of surgery or trauma, transplantation, autoimmune diseases (4,5)

Seven species have been associated with human disease. Nocardia asteroids is responsible for about 70% of infection caused by these organisms (3). Infection acquired by inhalation and shows acute, subacute and chronic forms. Clinical manifestation of lung and systemic nocardiosis are not specific and include anorexia, weight loss, productive cough, pleural pain and often dyspnea [6-9]. Pulmonary nocardiosis mimics pulmonary tuberculosis in clinical symptoms and radiological characteristics and it is often wrongly treated with anti-tuberculosis drugs [10].

A classic radiographic picture of tuberculosis that is unresponsive to medication should raise the suspicion of Nocardia infection. Since the clinical and radiological manifestation are non-specific and the microbiological diagnosis is often difficult, pulmonary nocardiosis will be mistaken for other infections such as pneumonia, tuberculosis, bronchogenic carcinoma or lung abscess [3]. Cotrimoxazole is the drug of choice which can be given alone or in combination with other drugs like imipenem, amikacin, third-generation cephalosporin or minocycline in serious cases. The duration of therapy should be at least 6 months in localized disease and one year or more in disseminated form depending upon severity of infection and the host immune status.

Conclusion

Nocardia is difficult to culture and there is no reliable serological test to detect its presence. Clinical manifestation and chest radiographic manifestation are plemorphic and non-specific. If the suspected case of tuberculosis not responding to antitubercular therapy and if the sputum is negative for AFB there is suspicion of pulmonary nocardiosis even in immunocompetent patients.

Conflict of Interest

The authors have no ûnancial relationships with any organization.

References

1. Tomas RM, Villaanueva RM, Calzada SR, et al. Pulmonary nocardiosis: risk factors and outcomes. Respirology. 2007; 12(3): 394-400.
2. Menendez R, Cordero PJ, Santos M, Gobernado M, and Marco V. Pulmonary infection with Nocardia species: a report of ten cases and review. European Respiratory Journal. 1997; 10(7): 1542-1546.
3. Hwang JH, Koh WJ, Suh GY, Chung MP, Kim H, Kwon OJ, et al. Pulmonary nocardiosis with multiple cavitatory nodules in a HIV-negative immuno-compromised patient. Intern Med. 2004; 43(9): 852-854.
4. Lerner PI. Nocardia Species. In: Mandel GI, Douglas RG, Bennett JE, eds Principles and practice of Infectious Diseases. 3rd Edn. New York, Churchill

Livingstone. 1990; 1926.

5. Rodrigues JL, Barrio JL, Pitchenik AI, et al. Pulmonary nocardiosis in acquired immunodeficiency syndrome: Diagnosis with Bronchoalveolar lavage and treatment with non-sulphur containing drugs. Chest. 1986; 90(6): 912.
6. Matulionyte R, Rohner P, Uckay I, Lew D, and Garbino J. Secular trends of Nocardia infection over 15 years in a tertiary care hospital. J Clin Path. 2004; 57: 807-812.
7. McNeil MM, Brown JM. The medically important aerobic actinomycoses: epidemiology and microbiology. Clin Microbiol Rev. 1994; 7: 357-417.
8. Palmer DL, Harvey RL, Wheeler JK. Diagnostic and therapeutic considerations in Nocardia asteroids infection. Medicine (Baltimore). 1974; 53: 391-401.
9. Presant CA, Wiernik PH, Serpick AA. Factors affecting survival in nocardiosis. Amer Rev Resp Dis. 1973; 108: 1444-1448.
10. Chopra V, Ahir GC, Chand G, Jain PK. Pulmonary nocardiosis mimicking tuberculosis. Ind J Tub. 2001; 48: 211-213.