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A CASE REPORT ON PULMONARY NOCARDIOSIS IN AN IMMUNOCOMPETENT CHILD

Microbiology

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ABSTRACT

Genus Nocardia usually affects an immunocompromised patient. Predominantly, the infection involves the lungs followed by Central Nervous System**.** In the paediatric age group, 60% to 70% of cases occur due to an underlying immunocompromised state. Approximately 30% of immunocompetent children can also get infected with *Nocardia* and present as lymphocutaneous disease, orbital cellulitis, arthritis, or pneumonia A case of pulmonary infection from *Nocardia* in an immunocompetent patient is reported here. The case patient was a 14-year-old child who presented with chronic off-and-on cough with expectoration from 2 to 3 years. Sputum for AFB smear showed acid-fast bacilli whereas HRCT lung was normal and *Mycobacterium tuberculosis* was not detected on RT-PCR. Antibiotic coverage was given with Tab. Linezolid 600mg BD and the patient improved gradually. India is endemic for tuberculosis and the clinical presentation of *Mycobacterium tuberculosis* and Pulmonary nocardiosis overlaps, this case report highlights the importance of suspecting Nocardia spp. infection in such cases as the immunocompetent paediatric age group.

KEYWORDS

Nocardia, Immunocompetent, Paediatric

INTRODUCTION

The genus Nocardia is ubiquitous in nature that usually manifests as an opportunistic infection in immunocompromised hosts. Nocardia can be found in soil, decomposing vegetation, and other organic matter, as well as in fresh and salt water.[1] Nocardia spp belongs to the aerobic actinomycetes group (Phylum: Actinobacteria, Order: Actinomycetales) of bacteria which are gram-positive bacilli showing branching filamentous forms, are non-spore-forming, and mildly acid-fast bacteria.[2] It is a unique case because we could not trace any precipitating cause of pulmonary nocardiosis in an immunocompetent child.

Case Report

A 14-year-old male child came to pediatric OPD with a history of chronic off-and-on cough with expectoration from 2 to 3 years which gets aggravated during the winter season and fatigue. There was no history of weight loss, fever or loss of appetite. Past surgical history was positive for a 15mm urinary bladder stone at the age of 2 years. He was delivered by a full-term vaginal delivery, with no developmental delay and is fully vaccinated.

In the hospital, he was investigated for AFB smear and RTPCR for Tuberculosis diagnosis along with all the viral markers to check for an immunocompromised state. On microscopy AFB smear of sputum sample showed pink-coloured filamentous branching bacilli which were further confirmed by modified acid-fast staining using 1% sulfuric acid as shown in [Figure 1] and Gram stain showed Gram-positive branching, often beaded, intertwining filaments that fragment into bacillary and coccoid forms as shown in [Figure 2].

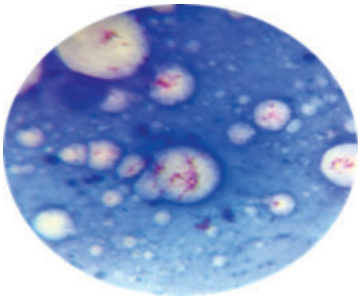

Fig 1: AFB smear of sputum sample under Oil immersion lens showing pink coloured filamentous branching bacilli

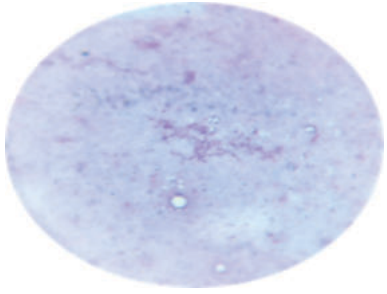

Fig 2: Gram Stain of sputum sample under Oil immersion lens showing beaded, intertwining filaments that fragment into bacillary and coccoid forms

The culture was done on Blood agar, Sabouraud dextrose agar (SDA) without antibiotics and incubated at 37C . On Blood agar, creamy, wrinkled colonies firmly adherent to the medium (1-2 mm in size after 48hrs of aerobic incubation) were seen as shown in [Figure 3].

Fig 3: Blood Agar plate showing creamy, wrinkled colonies of Nocardia

On SDA, the colonies were white, raised and irregular after 5 days of aerobic incubation. Mycobacterium tuberculosis was not detected on RT-PCR and all the viral markers were found to be negative.

Antibiotic coverage was given with Tab. Linezolid 600mg BD along with Tab. Allegra 120 mg HS for 14 days. A fortnightly follow-up was

done. The patient improved gradually along with evident weight gain in 4 months.

DISCUSSION

Nocardia, being an "opportunistic pathogen," primarily affects patients with immunosuppressive conditions. Irrespective of a patient's immunologic status, the isolation of *Nocardia* from the respiratory tract or another body source should not be regarded as a contaminant or commensal organism.[1] Human infection with *Nocardia* can 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), leading to dissemination to the different organ systems. *Nocardia* spp may also result from hospital-acquired infections, usually involving catheterized patients and those who undergo surgeries (postoperative infections).[2] In addition, men have a greater risk of getting the infection than women; for every female who gets sick with nocardiosis, there are about 3 males who get the disease.[4] Immunocompetent hosts represent 10–50% of cases of infection.[6] Pulmonary infection with *Nocardia* spp shows clinical symptoms similar to those suspected of pulmonary tuberculosis (fever, cough, chest pain, night sweats, weight loss and pneumonia).2 Furthermore, there is a low index of suspicion among clinicians to consider *Nocardia* over TB as a source of chronic cough since India is a high-burden TB country. The organism is slow-growing so cultures must be kept for at least 10 or 12 days before being discarded.[3] Low detection of *Nocardia* is often thought to be due to the failure of isolation of the bacteria in the expected time frame as it requires extended culture.[5] A case series by Lutfor A.B.et.al has reported a case of non-healing ulcer on the back infected with *Nocardia* spp. in a 12-year immunocompromised child.[5] Schoen L.et.al had reported a case of pulmonary nocardiosis in a 9-year-old female suffering from cystic fibrosis.[6] A case report by Dias M.et.al from South India reported Nocardia in an 8-month-old immunocompetent boy suffering from fever, cough, breathlessness.[7] Most of the case reports of Nocardia infection in the paediatric age group are on children with an underlying immunocompromised state. This case report is unique because we could not get any predisposing factor which led to pulmonary nocardiosis in this immunocompetent child.

CONCLUSION

Nocardia spp. is a common saprophyte in nature and can be isolated from soil, decaying organic matter, grasses, and straw. This child's father is a farmer and he did visit farm fields regularly, but there was no history of overt disease among any of the family members. We found no evidence of a precipitating cause. He had been in good health previously and had no anatomical abnormality of the lungs, inhaled foreign body or allergic to any known common allergen.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of Interests

All authors deny any financial or nonfinancial conflict of interests in the production of this case report.

REFERENCES:

1] Wilson, J. W. (2012). Nocardiosis: Updates and Clinical Overview. *MayoClinProc.,* 87(4), 403-407.

2] Kandi, V. (2015). Human Nocardia Infections: A Review of Pulmonary Nocardiosis. *Cureus.,*7(8):e304.

3] Holdaway, M. D., Kennedy, J., Ashcroft, T., & Kay-butler, J. J. (1967). Pulmonary Nocardiosis in a 3-year old child. *Thorax*., 22(4), 375-81.

4] (2018). Nocardiosis. http://www.cdc.gov/nocardiosis/infection/index.html

5] Lutfor, A. B., Afroz, S., Mahmud, A. M., Selim, T., Akhtar, T., Sultana, T., & Taskeen, S. (2021) Nocardia infection causing non-healing surgical wounds: A case series from Bangladesh. *Int J Infect Dis.*, 110:272-278.

6] Schoen, L., Santoro, J. D., Milla, C., & Bhargava, S. (2015). Pulmonary Nocardiosis in an Immunocompetent Patient with Cystic Fibrosis. *Case Rep in Pulmonol*., 2015:984171.

7] Dias, M., Antony, B., & Pinto, H. (2009). Spectrum of Nocardiosis-A report of three cases. *Journal of Clinical and Diagnostic Research*., 3(4), 1682-1684. https:// doi. org/ 10.7860/JCDR/2009/.557