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CASE SERIES

Pulmonary Nocardiosis mimicking Lung malignancy-A Case series

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ABSTRACT
Pulmonary nocardiosis is a rare entity. Here we present three cases misdiagnosed with a differential of lung malignancy or Tuberculosis and so treated having not shown any improvement and referred to Department of Respiratory Medicine United Institute of Medical Sciences Prayagraj (Allahabad), between January 2021 to December 2022. All the cases had fever, cough, expectoration for months together. We thoroughly evaluated all the cases clinicoradiologically and bacteriologically and finally reached the diagnosis of pulmonary nocardiosis and treated to complete resolution.
Key words-Nocardiosis, Modified Z N stain, Hemoptysis, Trimethoprim-sulfamethoxazole

INTRODUCTION

Nocardia are considered as gram positive, weakly acid-fast Bacteria. They grow in branching pattern but their hyphae are often fragmented and look like coccobacillary form [1]. Nocardia can cause disease of any part of body but predominantlyaffect lung,skin and central nervous system. Nocardia can also cause disseminated disease in immunocompromised patients. Pulmonary nocardiosis can occur as acute, subacute and chronic form. Predisposing factors for nocardiosis are mainly long-term steroid use, HIV, malignancy and COPD[2].Diagnosis of pulmonary nocardiosis is principally based on clinical manifestation, radiological investigation, gram stain and culture of respiratory specimen and biopsy or FNAC from the site of lesion.

CASE 1

A 65 year old male patient admitted in the department of respiratory medicine with the chief complaints of cough with expectoration, hemoptysis, fever, hoarseness of voiceand decreased appetite for last 20 days. Expectoration was clay colored and copious in amount (Image-5). Initially patient consulted to a ENT specialist for Hoarseness of voice where after evaluation they suspected lung malignancy and refer to our department for further management. There was no history of breathlessness, chest pain.There was no past history of tuberculosis, COPD, Asthma and any other chronic respiratory illness. Other medical and surgical history was not significant from clinical point of view. On respiratory system examination there was diminished breath sound on right side on auscultation, there were no abnormal sound heard over chest. General examination showed increased pulse rate and raised body temperature. X ray chest P A view, sputum for AFB and routine blood investigation were advised. Chest x ray showed a well circumscribed rounded opacity in right upper and middle zone(Image-1). Sputum for AFB was negative. CBC showed decreased Hb and hematocrit,CRP was increased.Serum creatinine was increased. LFT was normal. For further evaluation CECT thorax was advised which showed large nonhomogeneous opacity with cavitation in right upper and middle lobe(Image-2). CT guided FNAC was performed and sent for histopathological examination which revealed growth of filamentous organism with acute on chronic inflammation. Filaments seen as negative stain on ZN stain but positive filaments on modified ZN stain, in which decolorization is done using 1% sulphuric acid rather than 20% or 3% acid alcohol as for MTB.After diagnosing we prescribed double strength tablets of trimethoprim/Sulfamethoxazole twice a day

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for 6 months and patient improved both clinically as well as radiologically.

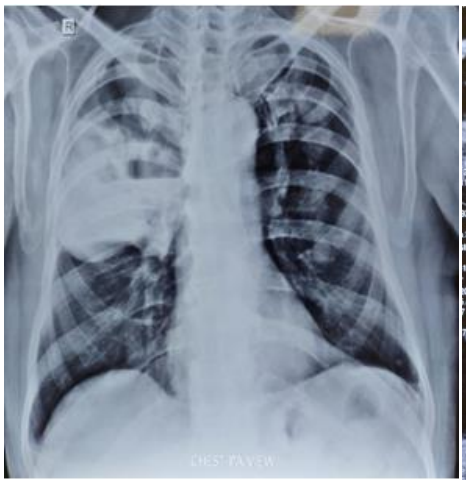


Image- 1
Chest X ray on admission

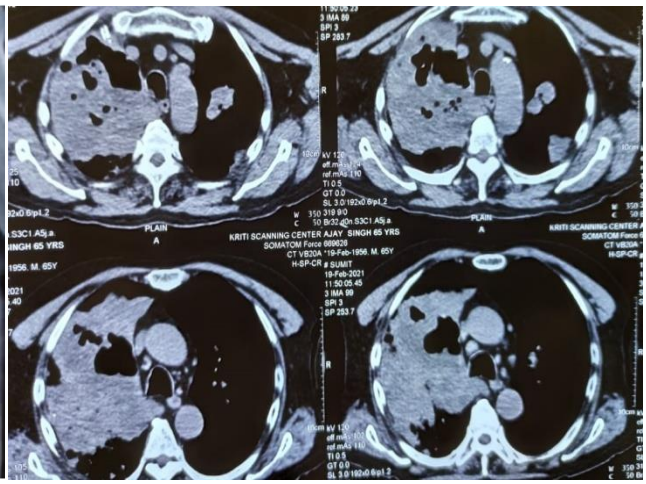


Image – 2
CT chest on Admission

Image-3
Chest X Ray at 6 month

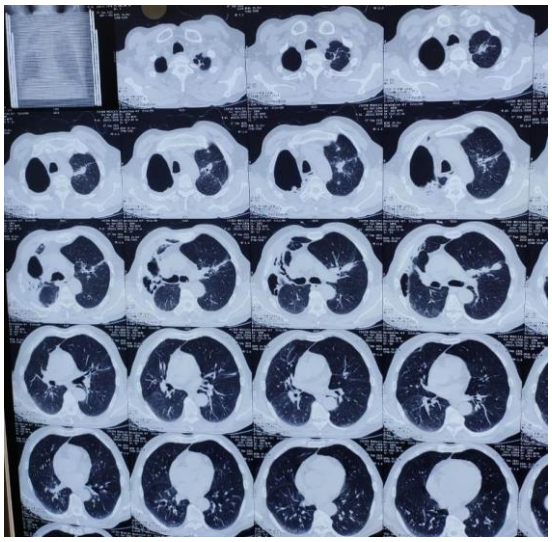


Image-4
CT chest at 6 month

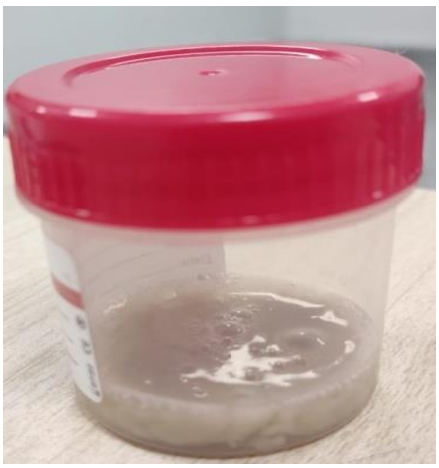
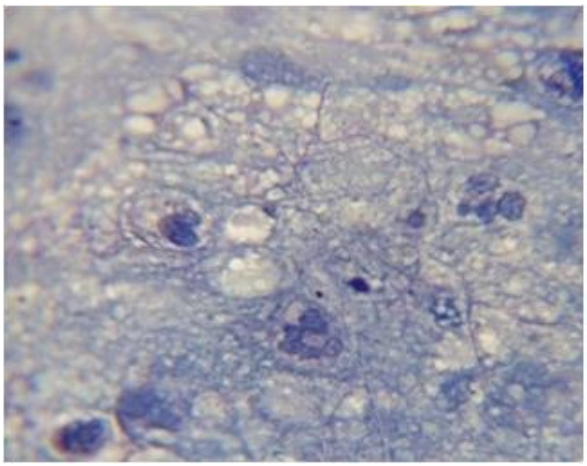


Image 5
Clay colored sputum



(Image-6)
Microscopy of FNAC specimen- (Filamentousform of nocardia)

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CASE 2

A 68 year old female patient came in the emergency department with complain of fever,breathlessness, cough with purulent expectoration for 15 days. Patient was a known case of COPD and on inhaled medication with oral steroids for last 10 year. General examination showed tachycardia, tachypnoea, raised body temperature and hypoxia (spo2 – 89%). There was bilateral pedal edema. Respiratory system examination revealed bilateral crepitations and wheeze with decreased air entry on left side of chest. On laboratory evaluation there was polymorphonuclear leukocytosis with raised ESR. ABG was suggestive of type 2 respiratory failure. Chest X ray was advised which showed irregular opacity with cavitation in left middle and upper zone. sputum for AFB and CBNAAT came out to be negative. Diagnosis of lung abscess was suspected and empiricallya combination of Pipracillin - Tazobactum, and clindamycin was started but patient did not respond and his condition started deteriorating. Diagnostic bronchoscopy was done and BAL was sent for gram stain and culture which revealed growth of gram positive thin filamentous bacilli which were negative on Z N stain but positive on Modified Z N staining.Patient was put on Trimethoprim- salfamethoxazolecomination. Patient started improving Clinically after 10 days. Radiological improvement was delayed and complete resolution was seen after 4 month.

CASE 3

A 62 year old patient admitted with complaints of fever, cough, loss of appetite and weight, hemoptysis for last 2 months. Before coming to our hospital he was treated as a case pulmonary kochs on clinical basis as sputum was negative for AFB, but even after taking ATT(HRZE) for 1 month his fever and cough did not subside and wasreferred to us for further evaluation.A detailed history revealed associated comorbidities like diabetes and Hypertension. History of treatment for pulmonary tuberculosis 5 years back was also evident. General examination showed increased respiratory rate, pulse rate and raised body temperature.Examination of the respiratory system revealed diminished breath sound and crepitation in right infra axillary area on auscultation. X ray chest, sputum for AFB and routine blood investigation were advised. Chest x ray showed a well circumscribed rounded opacity in right middle zone. Sputum for AFB was negative. CBC showed increased TLC with lymphocytosis. RBS was 341 mg/dl and HBA1c was 9.7. LFT and KFT was normal. CECT thorax was advised which shows well defined cystic mass lesion of size 68 x 55 mm in the posterior segment of right upper lobe with surrounding area of consolidation and ground glass opacity. Multiple centrilobular nodule with tree in bud pattern in right lower zone. CT guided FNA was performedand blood mixed pus was aspirated which was sent for culture. Culture showed gram positive filamentous branching rods which were negative on Z N stain but positive on modified Z N stain which increased our level of confidence of diagnosis of nocardia. After culture report we prescribed double strength tablets of trimethoprim/Sulfamethoxazole twice a day for 6 months and patient improved both clinically as well as radiologically.

DISCUSSION

Nocardia are ubiquitous and found all over world in soil , water and decaying vegetable matter[3].The genus of Nocardia consists of about 22 species, the most frequently isolated species belong to the N. asteroides complex, which is a heterogeneous group that includes N. asteroides, N. farcinica, N. nova and N. abscessus. The genus of Nocardia belongs to the family of aerobic actinomycetes which is characterised as gram-positive branching filamentous rods producing fungus-like colonies in culture[4]. Pulmonary Nocardia can occur mainly due to inhalation whilecutaneous nocardiosis occur due to contact with the bacteria via a cut or abraded skin after that the infection can then disseminate to other less common sites like brain, kidneys, joints, heart, eyes, and bones [5,6].The lungs are the most commonly involved organ and account for 73%–77% of nocardia infection[7] . In 25%–50% of cases, hematogenous and/or lymphatic spread occurs resulting in disseminated disease[7]. Pulmonary nocardiosis can present as acute, subacute or chronic infection. Pulmonary nocardiosis is underdiagnosed since clinicoradiological findings are non specific[8]. The radiographic pattern is also nonspecific with varied presentation such as lobar or multilobar consolidation,cavitary lesion, solitary lung masses and/or nodules, and reticulonodular infiltrates[8]. The clinical and radiological finding can mimic pneumonia, pulmonary tuberculosis and lung carcinoma or lung abscesses. The predominant symptoms of pulmonary nocardiasis are productive cough, dyspnoea, chest pain and loss of weight[8]. Pulmonary nocardiasisis fatal if not treated adequately. Mortality rates in immunocompromised patients with localized pleuropulmonary involvement range from 29% to 80%[9]. Nocardia can be identified microscopicaly by Modified Z N staining using 1% sulfuric acid as a decolorizer , where pink-colored filamentous branching bacilli are observed.

Cotrimoxazole is the drug of choice in the treatment of nocardial infection. Other alternative drugs which have activity against nocardia are Amikacin, imipenem, ceftriaxone, minocycline, levofloxacin, linezolid, and amoxicillin-clavulanic acid. Duration of therapy has not been systematically evaluated , but it is generally advised to treat cutaneous forms of Nocardia infection for one to three months, pulmonary or systemic nocardiosis for six months and those with involvement of the central nervous system

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for 12 months. All immunocompromised patients should be treated for at least one year [10,11].

Double strength of Trimethoprim- sufamethoxazole combination as a monotherapy for a duration of 4 to 6 months was given to our patients and they improved clinically, microbiologically as well as radiologically (Image3 &4).

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