

A Rare Case of Mycobacterium Avium Complex (MAC) Infection in an Immunocompetent Person

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Abstract

It is well known that Mycobacterium avium complex (MAC) infection occurs commonly in immune-compromised patients. We are reporting a case of MAC infection in a person in whom no evidence of immune-compromisation has been found despite thorough examination.

Key Words

Atypical Mycobacteria, Mycobacterium Avium Complex (MAC), Immunocompetent, Cavity

Introduction

Mycobacteria other than tuberculosis (MOTT) are also known as "atypical mycobacteria" and non-tuberculous mycobacteria (NTM). Most are saprophyte, but some NTM are pathogens & may cause variety of diseases especially in immunocompromised patients (1). Lung disease due to NTM occurs commonly in pre-existing lung disease like COPD, bronchiectasis etc (2). Among the NTM, Mycobacterium avium complex (MAC) infection occurs most commonly in an already diseased lung (3). Here we are presenting a case of MAC infection in a patient, in whom no evidence of immune-compromisation is found.

Case Report

A middle aged non-smoker Indian male attended the Chest department with the complaint of breathlessness and cough with expectoration for last two years. He also had low grade irregular fever with evening rise of temperature for same duration. Two years back, he was diagnosed as sputum smear positive pulmonary tuberculosis (PTB) and received 6 months intermittent regimen of anti tubercular drug (ATD) with isoniazid (H), rifampicin (R), ethambutol (E), pyrazinamide (Z). He was declared cured though his symptoms were persisting. After about 2 months his sputum smear examination was

repeated for his persistent symptoms and found to be positive for AFB. Again streptomycin along with HREZ was started for 8 months, considering the case as relapse PTB and he completed the course successfully. During the course his sputum for AFB became negative but at the end of the course, sputum became smear positive. Still his symptoms were persisting throughout the treatment course. He had no history of diabetes mellitus, haematological malignancies like lymphomas or leukaemia, and there was no past history of chronic corticosteroid or immunosuppressive therapy. Then he was referred to us as multi drug resistant tuberculosis (MDR TB) suspect. Four sputa samples were taken- two for AFB smear examination & another two for mycobacterium culture by MGIT-960 method. Again sputa smear examination was positive. Complete blood count was normal and his blood glucose level and renal function were normal. HIV test was negative (done twice within 6 months). Mantoux test (5 TU) was positive (induration of 11 mm). Chest x-ray showed left upper zone fibro-cavitary lesion with bi-lateral pseudo-blunting of costophrenic angles. Contrast enhanced computerized tomography (CECT) scan of thorax showed left upper lobe fibro-cavitary lesion (*Fig.1*). Spirometry revealed

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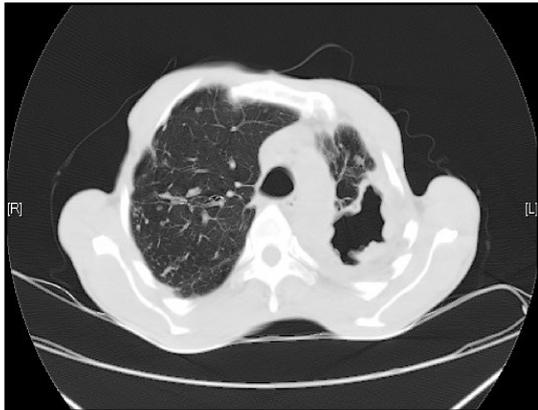


Fig.1 CECT Thorax Showing left Upper lobe Fibro-cavitary lesion

moderate airway obstruction with poor bronchodilator reversibility. Culture showed growth of atypical mycobacteria. Species identification revealed growth of *Mycobacterium avium* complex (MAC). As the organism was a slow grower, drug susceptibility test was not done. Then we started oral rifampicin 450 mg and ethambutol 800 mg once daily, oral clarithromycin 500 mg twice daily along with intramuscular streptomycin 500 mg daily. After 3 months of treatment, Streptomycin was stopped. After 6 months of treatment, patient was symptomatically better & culture was negative on two occasions. Rifampicin, ethambutol and clarithromycin were continued for 1 year after the sputum conversion. Patient came to Chest OPD for follow up.

Dscussion

Mycobacteria other than tuberculosis are appreciated as potential pathogens. These mycobacteria are identified by a variety of names, including mycobacteria other than tubercle bacilli (MOTT), environmental mycobacteria, "atypical mycobacteria" and non-tuberculous mycobacteria (NTM). They are generally found in the water and soil. Most are saprophyte, but some NTM are pathogens & may cause severe disease or even death, especially in immunocompromised. The most common clinical manifestation of NTM disease is lung disease, but lymphatic, skin/soft tissue, and disseminated disease can also occur (4,5). Lung disease due to NTM occurs commonly in structural lung disease, like chronic

obstructive pulmonary disease (COPD), bronchiectasis, prior PTB and esophageal motility disorders (5, 6-10). Bronchiectasis, cavitary lesion and NTM infection, commonly MAC, often coexist.

The American Thoracic Society (ATS) guideline include the following clinical, radiographic, and bacteriologic criteria to establish a diagnosis of nontuberculous mycobacterial lung disease (11). Patient must meet at least one of the last 3 criteria within 1 year.

" Pulmonary signs and symptoms such as cough, fatigue, weight loss; less commonly, fever and weight loss; dyspnea"

" Appropriate exclusion of other diseases (eg. carcinoma, tuberculosis)

" Chest radiograph with nodular or cavitary opacities

" High-resolution computerized tomography (HRCT) scan showing multifocal bronchiectasis and multiple small nodule

" At least 2 culture-positive sputum samples

" At least one culture-positive bronchial washing or lavage

" Biopsy with histopathologic features consistent with mycobacterial infections (eg, granulomatous inflammation or positive AFB stain) and positive culture result (sputum, endobronchial, or biopsy specimen)

To establish the diagnosis of NTM lung disease, the collection of three early-morning sputum or induced sputum specimens on different days are preferred. If sputum cannot be obtained, bronchoscopy with or without lung biopsy may be necessary.

Due to differences in antimicrobial susceptibility, species identification of the NTM becomes very important (12). Susceptibility testing is available in specialized laboratories but there are poor correlations between in vitro susceptibility results and clinical outcome. So the ATS guideline recommends routine antibiotic susceptibility testing for clarithromycin only (12). Treatment of MAC infection in immunocompetent patients involves the combination of a newer macrolide (azithromycin/

clarithromycin), ethambutol, rifampicin/rifabutin with/without Streptomycin.

ATS guideline recommends that most patients with nodular or bronchiectatic disease can be treated with a thrice-weekly regimen of clarithromycin 1000 mg or azithromycin 500 mg, rifampin 600 mg, and ethambutol 25 mg/kg. Therapy should be continued for at least one year after culture results revert to negative (11).

Lam et al verified comparable results between daily and thrice-weekly therapy in patients with non-cavitary lung disease, but found that patients with cavitary lung disease had worse outcomes with thrice-weekly therapy (13). Therefore, patients with fibrocavitary lung disease or severe nodular or bronchiectatic disease should receive a daily regimen of clarithromycin (500-1000 mg) or azithromycin (250-500 mg) rifampin (600 mg) or rifabutin (150-300 mg), and ethambutol (15 mg/kg).

In addition, the ATS guideline suggests the addition of amikacin or streptomycin thrice weekly early in the course of treatment (initial 2-3 months) in patients with severe and extensive fibrocavitary lung disease (11). Streptomycin has been used successfully in combination with macrolides for the first 6-12 weeks of treatment in patients with cavitary lung disease. In our case, with the above regimen, patient became culture negative and symptomatically better. During follow up visits, no relapse is seen & sputum smear for AFB remains negative.

Conclusion

In any patient having repeated sputum positivity, NTM infection should always be a possibility especially with structural lung disease, even also in immunocompetent patient. In our patient repeatedly ATD have been prescribed to him though his condition is not improved. Perhaps the patient would have received ATD for many times in the future unless the sputum culture for M. Tuberculosis is done. So the ultimate conclusion is that a physician should look for alternative aetiology in case of any treatment failure and MAC infection can occur in an immunocompetent person also.

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