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A Case Report of Non-Tuberculous Mycobacterium (NTM) Pulmonary Infection in a 70 Year Old Male

Chaudhari G.1, Gaikwad V.2, Pol S., Karyakarte R.

Corresponding Author: **Karyakarte R.**

Abstract: ***The non-tuberculous mycobacteria (NTM) are typically environmental organisms residing in soil and water. Although generally of low pathogenicity to humans, NTM can cause a wide array of clinical diseases; pulmonary disease is most frequent. The prevalence of NTM is 0.5 to 8.6% in India. Diagnosis of NTM is difficult owing to the fact that it is not a reportable disease and there is lack of awareness among clinicians and limitation of the laboratory capacity to diagnose this infection. We report one such case NTM infection, which has rarely been reported in the literature. Our case emphasizes the need to look for clinicians awareness about this infection and improve laboratory capacity to diagnose such a infection.***

Keywords: NTM, CBNAAT, RNTCP

1. Introduction

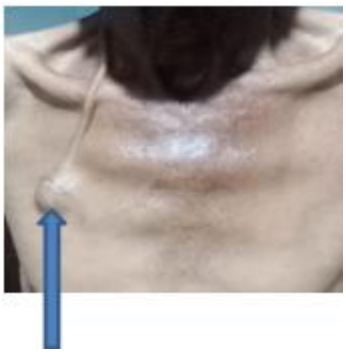
Non-Tuberculous mycobacterium (NTM) are generally free-living organisms that are ubiquitous in the environment [1]. The prevalence of NTM is 0.5 to 8.6% in India [2]. Humans are frequently in contact with NTM, as the bacteria live in the soil as well as natural and engineered water systems [3] Although the distribution of NTM species varies markedly based on geography, *Mycobacterium avium* complex (MAC) is the most common pathogen in most areas followed by *M. abscessus* complex and *M. kansasii*. [4] There are >140 NTM species reported in the literature, 25 species have been strongly associated with NTM diseases; the remainder are environmental organisms rarely encountered in clinical samples. Correct species identification is very important because NTM species differ in their clinical relevance. [6]The multi-drug regimens used for NTM disease treatment includes a newer macrolide (azithromycin, clarithromycin), ethambutol, and rifamycin, and require prolonged durations of therapy aimed at facilitating clearance of the mycobacteria and minimizing the emergence of drug resistance. [5]

2. Case Detail

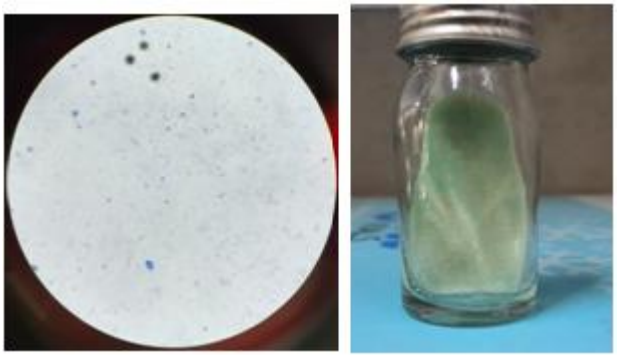
We reported a case of non Tuberculous mycobacterial pulmonary infection in a 70 yr old male patient. Patient had a history of pulmonary tuberculosis in1978 which was diagnosed by smear microscopy only. On that basis RNTCP started AKT, which the patient took for 3.5 months. The patient continued having on and off symptoms. In 2017, the patient again developed productive cough, chest pain and dysponea. The patient visited RNTCP center for further investigations, which showed that-CBNAAT was negative and smear positive. The patient was again treated with AKT for 1 and half yrs. Inspite of the treatment, patient's symptoms persisted. Patient again tested smear positive and CBNNAT negative in December 2021 in IRL Aundh. This time RNTCP thought about the possibility of NTM and for the further investigations they send patient to BJGMC TB lab.

BJGMC TB LAB received 3 consiquitive samples from 28-31 December 2021. All 3 samples showed a 3+ positive smear. CBNAAT was done on first sample which was negative. Culture was done on first 2 consiquitive samples on LJ medium. Both the culture was positive on day 4th. Biochemical tests like Niacin test, Nitrate reduction test, Citrate utilization test, Iron uptake test was negative and 5% NaCl in LJ showed growth. On that basis NTM (mycobacterium abscessus) was detected and patient was started on oral macrolides (clarithromycine, ethambutol and rifampin), which proved to be ineffective. At that time On physical examination the patient was a febrile and had a respiratory rate of 19 beats per mint, a pulse rate of 82bpm and blood pressure of 108/66mmHg, Dyspnea on exertion - Grade III, A-E assessment-Decrease right side. He had no cardiac gallop, murmurs or rubs. Abdominal examination was normal and he had no pedal edema. Chest x-ray finding shows mediastinal shift to right side, Right upper lobe shows loss of volume, fibrotic scars and cavities are noted, nodular lesions are seen in both upper and mid zone, hyper-inflated left lung field. CT scan findings are small area consolidation in posterior segment with right upper lateral lobe shows loss of volume and few large thin walled cavities with nodular lesion in anterior segment in right lung, fibrotic scars are noted, pleural thickening is also note.

In January 2022 As the initial drug that were given were ineffective the strain was send for DST to a private hospital. The drug susceptibility testing was done using broth micro-dilution (MALDI -TOF) method which shows susceptibility for drug Amikacin, Cotrimoxazole, Linezolid, intermediate susceptible for ciprofloxacin, cefoxitin, imipenem and Resisitant to Tobramycin, Moxifloxacin, Doxycycline, Minocycline, Ceftriaxone, Clarithromycine and Amoxyclav. Patient was advised treatment of Inj. Amikacin 750mg for six months via chemoport inserted over chest on right side and Tab. Cotrimoxazole (160+800) BD for 3 months. Now the Patient shows symptomatic improvement.



Chemo-port inserted over right side of the patient chest



A) AFB in sputum sample B) Clustering of mycobacteria on Löwenstein-Jensen culture medium

(A) (B) (C) (D) (E)

Negative control positive test

Biochemical tests-A)Nitrate reduction test B)Iron uptake test C) Citrate utilization test D)5% NaCl test E) Niacine test

3. Discussion

Pulmonary infections caused by NTMs are often misdiagnosed as conventional TB caused by members of the MTBC because of the non-specificity of sputum smear microscopy [7]. In addition, because of their intrinsic resistance to most first-line anti-TB drugs [8] NTMs-associated TB may be normally diagnosed as TB and managed as MDR with its associated public health implications. [9]

In our case also the patient is, developed resistance against empirically used antibiotics, because of misdiagnosis for many years.

4. Conclusion

The case history shows the probability of the patient being infected with NTM initially. Due to lack of awareness of NTM infections in hospital settings could have led to the late diagnosis of this patient. If symptoms persist and radiological diagnosis suggestive and CBNAAT negative sample should be sent for NTM detection by the clinician.

To ensure correct, timely diagnosis and treatment to reduce drug resistance in the society.

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References

[1] Wassilew N, Hoffmann H, Andrejak C, Lange C. Pulmonary disease caused by non-tuberculous mycobacteria. Respiration. 2016; 91 (5): 386-402.
[2] Jain S, Sankar MM, Sharma N, Singh S, Chugh TD. High prevalence of non-tuberculous mycobacterial disease among non-HIV infected individuals in a TB endemic country-experience from a tertiary center in Delhi, India. Pathogens and global health. 2014 Mar 1; 108 (2): 118-22.
[3] Falkinham, III JO. Surrounded by mycobacteria: nontuberculous mycobacteria in the human environment. Journal of applied microbiology. 2009 Aug; 107 (2): 356-67.

[4] Ryu YJ, Koh WJ, Daley CL. Diagnosis and treatment of nontuberculous mycobacterial lung disease: clinicians' perspectives. Tuberculosis and respiratory diseases. 2016 Apr 1; 79 (2): 74-84.
[5] van Ingen J. Diagnosis of nontuberculous mycobacterial infections. InSeminars in respiratory and critical care medicine 2013 Feb (Vol. 34, No. 01, pp. 103-109). Thieme Medical Publishers.
[6] Twabi HH, Mukoka-Thindwa M, Shani D, Nliwasa M, Corbett EL. Non-Tuberculous Mycobacterial Pulmonary Disease identified during community-based screening for Mycobacterium Tuberculosis: a case report. Malawi Medical Journal. 2021 Mar 31; 33 (1): 65-7.
[7] Desikan P. Sputum smear microscopy in tuberculosis: Is it still relevant? Indian J Med Res. 2013; 137: 442-4. [PubMed: 23640550]
[8] Griffith DE, Aksamit T, Brown-Elliott BA, Catanzaro A, Daley C, Gordin F, et al. American Thoracic Society Documents An Official ATS/IDSA Statement: Diagnosis, Treatment, and Prevention of Nontuberculous Mycobacterial Diseases. 2007
[9] Couto I, Machado D, Viveiros M, Rodrigues L, Amaral L. Identification of nontuberculous mycobacteria in clinical samples using molecular methods: A 3-year study. Clin Microbiol Infect. 2010; 16: 1161-4. [PubMed: 19832711]