Research Paper

Volume : 2 | Issue : 10 | October 2013 • ISSN No 2277 - 8179

# Disseminated Mycobacterium Abscessus Infection in a Patient with Diabetes

Medical Science

**KEYWORDS :** Nontuberculous mycobacteria, Mycobacterium abscessus, diabetes

**Das M** — Corresponding author. Assistant Professor, Dept of Microbiology, ASRAM Medical College, Eluru

**Mohanty D** — Associate Professor, Dept of ENT, ASRAM Medical College, Eluru.

## ABSTRACT

*The nontuberculous mycobacteria are opportunistic pathogens. Mycobacterium abscessus is one of the most notorious among them being difficult to treat because of emerging drug resistance. We present a case of disseminated M abscessus infection in a 44years old female with diabetes. The most active agent in the reported case was found to be a combination of clarithromycin and levofloxacin administered orally, which was found to be effective on follow-up after two weeks.*

**Introduction**

The nontuberculous mycobacteria (NTM) cause disease in individuals with altered local or systemic immunity. We report a case of disseminated *Mycobacterium abscessus* infection in a patient with underlying diabetes mellitus.

**Case Presentation**

A 44 year old woman presented to the Endocrinology Department, SGPGIMS, Lucknow with fever, loss of appetite and weight loss since 1 year. Her fasting blood sugar was 400mg/dl with glycosylated haemoglobin of 16.4%. She had been investigated at a local hospital and given symptomatic therapy when no cause of fever could be determined. Chest radiography showed miliary shadows and she was started on rifampicin, isoniazid and ethambutol for presumed tuberculosis. CT scan of the abdomen showed lesions in the liver and spleen. Upper gastrointestinal endoscopy showed whitish streaks in the stomach. Biopsies were collected from the bone marrow, liver and gastric mucosa and microbiological and histopathological investigations were carried out.

Routine bacterial cultures from the biopsies and blood were sterile. Ziehl Neelsen (ZN) stain from bone marrow, liver and gastric biopsies demonstrated no acid fast bacilli (AFB). PCR done for *Mycobacterium tuberculosis* was negative. Routine sputum cultures done on LJ media were negative for AFB. Histopathological examination of the bone marrow showed mild plasmacytosis with no granuloma or infiltrations. Bone marrow biopsy was positive for AFB after 18 days of incubation in the BacT/ Alert™ system. Subcultures done from this on blood and MacConkey agar (*Fig 1*) showed small (0.5-1mm), dry colonies in 72 hours. Lowenstein Jensen (LJ) medium showed nonpigmented, butyrous, confluent growth (*Fig 2*) in 72 hours. ZN stain (*Fig 3*) done from the above three media was positive for AFB. Genotyping was done with the help of GenoType® Mycobacterium CM/AS assay (*Hain Lifescience, Germany*) which gave bands positive for *Mycobacterium abscessus* (*Fig 4).* The isolate was resistant to isoniazid, rifampicin, ethambutol and streptomycin in the 1% proportion method done in the BacT/ Alert system. It was sensitive to clarithromycin, azithromycin, levofloxacin amikacin, cefoxitin, imipenem and linezolid by the disk diffusion method done on Middlebrook 7H11 agar (*Fig 5*).The patient was started on clarithromycin and levofloxacin as the patient insisted on oral therapy and was asked to come for follow-up after a fortnight.

On follow-up, she was found to be afebrile and had gained weight. She was asked to continue on clarithromycin and levofloxacin and come for follow-up after 3 months.

**Discussion**

*M abscessus* is the most pathogenic rapid-growing mycobacterium (RGM). The 1st documented case of *M abscessus* infection was reported in 1953. [1]

Tubercular infections are suspected in cases of fever of unknown origin, especially in an endemic country like India. Roelandt et al [2] suggest that bone marrow (BM) biopsy should be done in cases of fever of unknown origin, especially in patients with underlying risk factors. The BM niche protects stem cells from immune attack. Therefore, this niche is an attractive site where tubercular bacilli could persist while evading the host immune response and antitubercular agents. [3]

The patient had infection with *M abscessus* with diabetes mellitus as an underlying disease. Primary source for dissemination in the body was pulmonary. >80% of all pulmonary infections by RGM are due to *M abscessus*. RGM are ubiquitous in the environment, even in drinking water and exposure is common. [4] The typical patient was a non-smoking older female with a gradual onset of the disease. Cavitation in these cases is unusual. Patients are defined as having NTM disease, if they have a positive culture from a single biopsy specimen.

Formerly a part of *M chelonae* complex, recently the *M abscessus* species, has been sub-classified into three new species on the basis of *rpoB* sequences: *M abscessus sensu stricto, M massiliense* and *M bolletii*. They constitute what is now called the M abscessus group, or M abscessus sensu lato [5]

Conventional treatment of disseminated nontuberculous mycobacterial infection involves the use of a combination of antibiotics selected by in-vitro susceptibility testing [6]. The CLSI has recommended broth microdilution as the standard for susceptibility testing of RGM. [7] The current agar disk diffusion method for RGM is a modification of the Kirby-Bauer method used for bacterial susceptibility testing. [8]. The most active agent against M abscessus is amikacin [9]. It is combined with cefoxitin or imipenem for a minimum of 8 weeks for the treatment of adult patients.

A number of mechanisms are responsible for the intrinsic resistance of M abscessus to various drugs, including slower growth (as compared to other RGM), drug export systems and genetic polymorphisms [10] Acquired mutational resistance to aminoglycosides is due to an inducible methylase (erm gene) [11] Clarithromycin resistance is more often associated with cystic fibrosis than other underlying diseases.

The notoriety of *M abscessus* to cause virulent and chemotherapy-resistant infections has led to the development of genetic methods to decipher its secrets. It should be considered in the cases of fever of unknown origin and failure of response to classic antitubercular agents.

**Acknowledgements**

The authors acknowledge the help and kind guidance of Prof. Dr. RSK Marak and Prof. Dr. TN Dhole (Head) of Microbiology Department of the SGPGI Lucknow and the concerned authorities for providing laboratory facilities. They also thank the ASRAM Medical College and Hospital authorities for permission to publish this work.

**Fig 1 Growth on MacConkey medium**

**Fig 2 Growth on LJ medium**

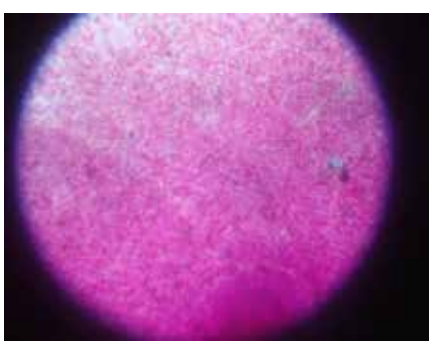

**Fig 3 ZN staining of smear made from LJ medium**

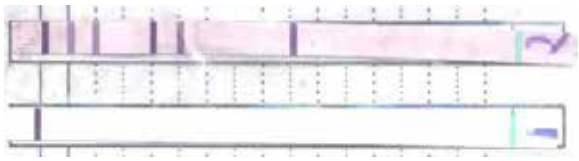

**Fig 4 Genotype® CM/AS strip showing *M abscessus* (2) and control strip (1)**

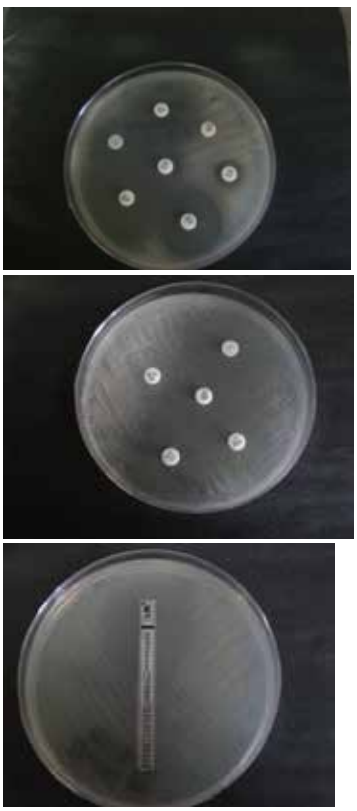

**Fig 5 Antibiotic sensitivity testing done for the isolate**

## REFERENCE

1. Moore M., Frerichs J.B. (1953), An unusual acid fast infection of the knee with subcutaneous abscess-like lesions of the gluteal region, Report of a case with a study of the organism, Mycobacterium abscessus, n.sp. J. Invest Dermatol., 20: 133-69 | 2. Roelandt PR, Dendooven M, De Groef K, Van Couter A, (2006) Hidden tuberculosis revealed by bone marrow biopsy as cause of fever of unknown origin. Acta Clin Belg, 61 (6): 363-366 | 3. Das B, Kashino SS, Pulu I, Kalita D, Swami V, (2013) CD 271+ Bone Marrow Mesenchymal Stem Cells may provide a niche for Dormant Mycobacterium tuberculosis. Sci Transl Med 30; 5 (170) | 4. Piersimoni C., Scarparo C., (2008), Pulmonary infections associated with non-tuberculous mycobacteria in immune competent patients. Lancet Infect. Dis., 8: 323-334 | 5. Adekambi T., Reynaud-Gaubert M., Greub G., (2004), Amoebal co-culture of "Mycobacterium massiliense" sp. Nov. from the septum of a patient with hemoptoic pneumonia. J. Clinic. Microbiol., 42, 5493-5501 | 6. Colsky A.S., Hanley A., Elgart G., Kerdel F.A., (1999), Treatment of refractory disseminated M. abscessus infection with interferon gamma therapy. Arch. Dermatol., 135: 125-127 | 7. Woods G.L., NCCLS document M 24-A, National Committee for Clinical Laboratory Standards, Wayne, P.A., Susceptibility testing of mycobacteria, nocardia and other aerobic actinomycetes, Approved standard. | 8. Brown-Elliot B.A., Wallace R.J. Jr., (2002), Clinical and taxonomic status of pathogenic non-pigmented or late-pigmenting rapidly growing mycobacteria Clin. Microbiol. Rev., 15: 716-746 | 9. Brown-Elliot B.A., Nash K.A., Wallace R.J. Jr., (2012), Anti-microbial susceptibility testing, Drug resistant mechanisms - Therapy of infections with non-tuberculosis mycobacteria. Clin. Microbiol. Rev., 25(3): 545-582 | 10. Nessar R., Cambau E., Reyrat J.M., Murray A., Gicquel B. (2012) Mycobacterium abscessus: a new antibiotic nightmare. J. Antimicrob. Chemother. 67: 810-818. | 11. Nash K.A., Brown-Elliot B.A., Wallace, R.J. Jr., (2009) A novel gene, erm confers inducible macrolide resistance to clinical isolates of Mycobacterium abscessus but is absent from Mycobacterium chelonae. Antimicrob. Agents Chemother., 53: 1367-76 |