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Case Report

A Masquerading Case of IGRA Positive Mycobacterium Szulgai

Abstract

It is well known that Interferon-gamma release assays (IGRAs) are more specific than the purified protein derivative (PPD) skin tests in diagnosing tuberculosis as it is not confounded by prior bacillus Calmette-Guérin (BCG) vaccination. We present a unique case of false positive IGRA in a 57 year old female with Mycobacterium szulgai cavitary lung infection.

Introduction

The incidence of Nontuberculosis Mycobacteria (NTM) has been steadily increasing over the past few years. Whether it is due to improve methods of identification and increased clinical awareness, or because the incidence of immunosuppression and patients with lung disease has increased remains debatable. Additionally, the use of interferon-gamma release assays (IGRA) has increased, with an increased specificity in patients with NTM exposure compared to tuberculin skin testing. Nonetheless, these assays do cross react with a limited number of NTM which can complicate the diagnosis and management of a patient. We report the case of a patient with known chronic obstructive pulmonary disease (COPD) who presented with Mycobacteria szulgai pulmonary infection who was initially thought to have Mycobacterium tuberculosis-complex infection due to a positive IGRA.

Case Report

A 57 year old woman was admitted with worsening shortness of breath of 1 week duration. The patient is known to have COPD and a 30-pack-year smoking history. Her social history is relevant for a 3 year incarceration 20 years ago; additionally the patient previously worked in a glue factory and later assembled cars.

Upon review of symptoms, the patient endorsed a dry cough, one month of night sweats, low grade fevers and a 10 pound unintentional weight loss. On presentation her vital signs were as follows: Temperature taken orally at 97.3F, Heart Rate 130 bpm, Respiratory Rate 20/min and Oxygen Saturation of 92% on room air.

The patient's white blood cell count was 21,600 cells/mL, with 70.3% neutrophils. A two-view chest roentgenogram showed chronic emphysematous changes and bilateral reticulonodular opacities concerning for either tuberculosis, sarcoidosis or silicosis. A computed tomogram of the chest was performed demonstrating a pulmonary embolus in the right upper lobe as well as fibrosed cavitary lesions in both upper lobes. The patient was started on therapeutic enoxaparin for treatment of a pulmonary embolus.

Throughout her stay the patient was maintained on airborne precautions for concerns of tuberculosis. Three consecutive sputum smears with acid fast staining yielded positive results with "many acid fast bacilli" on smear. Cultures began to show growth in less than one week. An IGRA (Quantiferon-TB Gold In-Tube assay) was also positive. Based on these results, empiric therapy against M.tuberculosis was initiated with isoniazid, rifampin, ethambutol and pyrazinamide. HIV test was negative.

Hologic GenProbe Amplified MTD on a sputum sample was however negative for Mycobacterium tuberculosis. Hologic GenProbe AccuProbe for M. Tuberculosis, MAC, M.kansasii and M. gordonae was also negative. Airborne isolation was continued pending further work up.

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Genetic sequencing revealed Mycobacterium szulgai. The patient was treated with Clarithromycin, Ethambutol and Rifampin. Patient was deemed to have a heavy disease burden and is expected to be treated for 12 consecutive months after culture clearance is achieved. Patient was followed up in Infectious Diseases clinic after 3 months, with repeat testing smear-negative for acid fast bacilli in sputum and clinically improved.

Discussion

M. szulgai is a slow growing NTM, found ubiquitously in nature. It was first described in the literature in 1972 after it was diagnosed by lipid assay [1]. Manifestations of M. szulgai infections are predominantly pulmonary but the literature reports rare cases of bursitis and osteomyelitis as well as cutaneous manifestations [2,3]. Pulmonary symptoms generally include dry, chronic cough, dyspnea, and fatigue and weight loss [4]. The organism is predominantly acquired through the environment rather than other infected individuals, and thus there is no need for airborne isolation once M. szulgai is identified. Identification of M. szulgai can be made via 16S ribosomal DNA sequencing; other methods include PCR with restriction length polymorphisms analysis.

As per the American Thoracic Society/Infectious Diseases Society of America guidelines, the clinical diagnosis of NTM require pulmonary symptoms, appropriate imaging findings, and exclusion of other diagnoses. Microbiological diagnosis depends on the specimen obtained; if sputum is obtained two positive results from separate specimens are needed [4].

Currently two commercially available IGRAs exist, the Quantiferon-TB Gold In-Tube assay and the T-Spot.TB assay. Both quantify the production of interferon gamma released by T lymphocytes in response to specific tuberculosis antigens. The Quantiferon-TB Gold In-Tube assay measures 3 proteins: ESAT-6, CFP-10, and TB7.7 while the T-Spot.TB measures ESAT-6 and CFP-10 [5]. These antigens are not present on Bacillus Calmette-Guerin (BCG) nor most NTM, however are present on M. kansasii, M. marinum, and M. szulgai. Thus, exposure to these three species could yield a falsely positive IGRA reaction, suggesting tuberculosis instead. Thus positive IGRA results do not translate into Mycobacterium tuberculosis infection.

Conclusion

Thus positive IGRA results do not translate into M. tuberculosis infection. Further speciation is warranted in cases of clinical suspicion such as in our patient as results will significantly affect the need for airborne isolation, choice and duration of antibiotics. This case reiterates crossreactivity of IGRA with NTM.

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