2017

Mycobacterial Disease Overlooked in a Frail Diabetic Male Treated for Pneumonia

Aydin Tavakoli MD MSc
Western Michigan University Homer Stryker M.D. School of Medicine

Glenn V. Dregansky DO
Western Michigan University Homer Stryker M.D. School of Medicine

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Aydin Tavakoli, MSc, M.D.; Glenn V. Dregansky, D.O.

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Purpose

Mycobacterial disease is treatable and its spread is preventable. Even in the United States its' insidious presentation and low incidence, can be overlooked when practitioners address pulmonary disease. We present a case of mycobacterial illness mistakenly treated as severe pneumonia.

Consideration for tuberculosis (TB) & non-tuberculous mycobacterial disease (NTM)

1. Data for spread of TB/ NTM mycobacterial disease in the US:
•The WHO estimates that 1/3 of the world's population is infected with TB with a resurgence in both TB and NTM.
•TB low incidence in US but risk factors (RFs), while spread of NTM disease in the US is unknown.

2. Diagnostic criteria has become more lenient and with expansion of specific radiological criteria more cases of TB diagnosed and treated[1]

3. Awareness of risk factors for mycobacterial disease (selected few[4])

Immunocompromised Host
- AIDS
- Steroid treatment
- Carcinoma
- Transplant recipients
- Children

Environmental Factors
- incarceration
- homelessness
- occupational exposure

4. High risk progression latent TB infection to TB (selected risk factors)[2]
- HIV
- immunocompromised (Diabetes mellitus, steroid therapy)
- malignancies
- infants and children < 4 years of age
- body weight ≥ 10% below ideal body weight

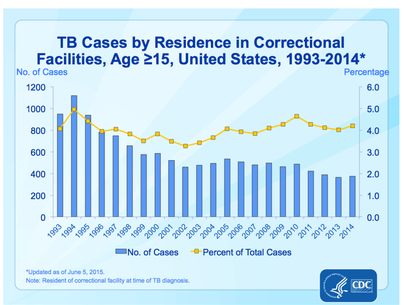


Figure 1: Resident of any type of correctional facility at the time of TB diagnosis. Total number of cases have dropped by percentage of total cases from correctional facilities has risen.

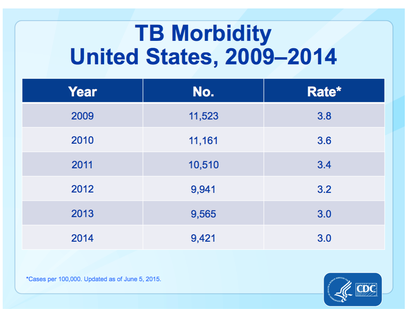


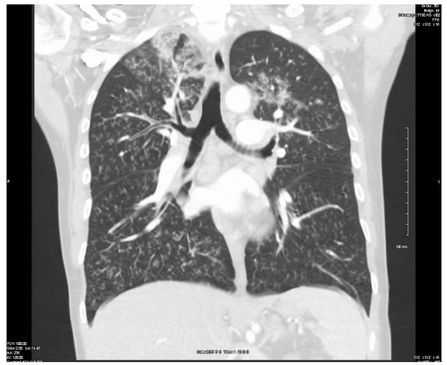
Figure 2: Total number of reported U.S. TB cases and the associated rates for each of the past 6 years. Rate = cases/100,000 population. Rate has not decreased in last 2 years.

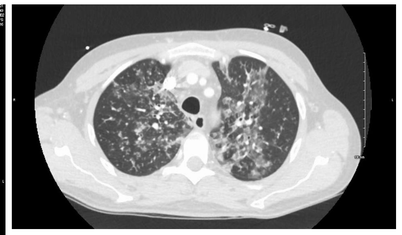
CASE REPORT

Patient description:
- 43 year old Caucasian male with poorly controlled type 1 diabetes
- A1c 9.1%, with considerable neuropathy, non smoker, no drug use
- 1 month history of cough, weakness, night sweats/chills, weight loss, severe dyspnea on exertion
- Incarceration, 10 yrs ago (TB skin test positive with negative CXR)

Presented to ED in DKA. He was treated in ICU for euglycemia and his pulmonary disease was characterized as a bacterial pneumonia.
- respiratory infectious disease panel was negative and he was treated with broad spectrum antibiotics and discharged.

Hospital follow up a week post discharge, complains of continued dyspnea on exertion and weakness. A careful examination of imaging report and history taking consisted with a timely screening for TB.





Picture 1 and Picture 2 –CT chest with contrast coronal (left), and axial (above). Strongly suggestive of tuberculosis. Mediastinal hilar adenopathy, apical infiltrates. Notable of a military infiltrative pattern.

QuantiFERON gold test (QFT) was positive and our patient was admitted again, this time to our isolation inpatient service for evaluation.
- His acid fast bacillus smear being positive, he was started on rifampin, isoniazid, pyrazinamide, ethambutol (RIPE) therapy. He was discharged after three negative sputum smears on the same therapy with cultures pending final characterization.

On hospital follow up, he was continuing his RIPE therapy. His blood glucoses were not well controlled with improvement in his respiratory status as he was ambulating with less dyspnea. No chills, fevers, night sweats. Moderate weight gain.

Our patient was lost to subsequent follow up. He had not been seen again by our ID colleagues.

Discussion

Principles:
•Identify/Screen patients at high risk for TB/ latent TB infection (LTBI)
•Screening modality in individuals with poor follow up
•Differential in immunocompromised patient must be broad
•Populations in TB endemic areas are known to have concomitant TB/pneumonia, in the low endemic areas such as the US, these cases are insidious[5]

What we've learned: someone that has symptoms and risk factors must be screened for mycobacterial disease

Future considerations

This report documents a common treatment algorithm, based on a differential focused on typical culprits for pulmonary infection. Latent mycobacterial infections in our community do exist, and can lead to fulminant TB especially in individuals who are immunocompromised and uncontrolled diabetics. Mycobacterial risk in these populations should be assessed. Screening tests, even in non-compliant individuals are easily obtainable. A focus should be placed on identifying patients at risk for exposure to TB and providing diagnosis and treatment for latent infection or active disease.

Our residency program works out of a Federally Qualified Health Center, where our population is high risk for LTBI. Risk factors include: residing in shelters, homelessness, higher rates of intravenous drug use, chronic conditions, and/or history of imprisonment. Many of these factors contribute to low rates of follow-up for screening with the tuberculin skin test.

Ideal State: Identifying and screening high-risk patients with no previous testing or prior negative test results with the QFT. This is a blood test which does not require follow-up for results. Use a symptoms-based questionnaire for patients with known LTBI to monitor progression to active disease. QFT could be administered to those identified as high risk even with no previous testing or prior negative test results. As these tests result, evaluation with a chest X-ray would stratify our groups to either further evaluate for latent mycobacterial infections or to treat based on positive chest X-ray. Educating all providers who care for these patients on whom to screen for TB and how to follow-up on positive results. Outcome measure would include: TB screening tests, follow up imaging, and treatment if indicated for LTBI or active infections.

References

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(3) WHO Global tuberculosis report 2013. http://apps.who.int/iris/bitstream/10665/91355/1/9789241564656_eng.pdf (Accessed on November 18, 2013).
(4) CDC.org
(5) Feng J-Y, Fang W-F, Wu C-L, Yu C-J, Lin M-C, et al. (2012) Concomitant Pulmonary Tuberculosis in Hospitalized Healthcare-Associated Pneumonia in a Tuberculosis Endemic Area: A Multi-center Retrospective Study.7(5): e36832. doi:10.1371/journal.pone.0036832

Contact: aydin.tavakoli@med.wmich.edu