

An Inappropriate Chest X-ray Leads to a Near-Delay of an Urgently Needed Procedure

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Story from the Front Lines:

A man in his 50's with a history of hypertension, alcohol abuse, and peripheral arterial disease with stent placement was admitted with critical limb ischemia. Review of his chart revealed that he had a pending and interferon gamma release assays (IGRA) in preparation for him to attend an outpatient alcohol treatment program. Out of concern for potentially underlying active tuberculosis (TB), the interventional cardiology team recommended delaying any intervention until the test had resulted - a turnaround of 10 days.

In order to expedite treatment of symptomatic limb ischemia, we investigated the rationale behind the ordering of the IGRA. The patient had recently relapsed into heavy alcoholism since the death of his wife several months prior. He had expressed to his primary physician the desire to attend an inpatient alcohol treatment program. During the intake process, a mandated screening chest x-ray showed a small left lower lobe nodule which prompted a CT scan confirming a small pulmonary nodule, but no cavitary lesions, infiltrates or other concerning findings. Despite no clinical symptoms or radiographic findings to suggest active TB, an IGRA was ordered to rule it out. At the time, the patient had been living with his niece and her young children. When advised of his doctors' concern for TB, his niece asked him to find alternative housing which resulted in him becoming homeless. It was after that that he presented with symptoms of critical limb ischemia.

After a careful interview we determined that the patient had no significant risk factors for TB. He was never incarcerated, and prior to this event had never been homeless. He had not traveled to TB endemic areas and did not have clinical symptoms such as fever, weight loss, hemoptysis, or cough. Following a discussion with our colleagues in cardiology the patient was taken immediately to the catheterization lab for peripheral angiography which revealed acute iliac stent thrombosis. Percutaneous intervention was undertaken and his symptoms resolved.

Teachable Moment:

Patients entering substance abuse rehabilitation often undergo screening for TB. The reasons for this are many, including exposure to high risk environments such as prisons and homeless shelters, decreased access to routine medical care, and higher risk of becoming contagious as undetected disease progresses. (1, 2) Alcohol abuse uniquely increases risk for TB infection through direct immunosuppression via macrophage dysfunction and impaired T-cell activation downstream. (2)

The 2017 guidelines by the American Thoracic Society, Infectious Diseases Society of America, and the Centers for Disease Control and Prevention Clinical Practice for TB diagnosis in adults and children states that there is no ideal screening test for latent TB infection (LTBI) due to the lack of head-to-head comparisons of diagnostic approaches, including TB skin test (TST) and IGRA. (3) These guidelines make recommendations based on risk stratification of the patient and the accuracy of available tests. Our patient falls into the category of a person ≥ 5 years of age, who is unlikely to be infected with TB, but in whom it has been decided that testing for LTBI is warranted. In this category, guidelines state that both

TST and IGRA are likely to have more false-positives in populations with lower prevalence of LTBI, and that such persons **should not** be tested. However, if testing is mandated by legal or credentialing purposes, and are not risk-driven, IGRA is recommended over TST, despite lack of clear clinical superiority. Chest x-ray has historically been useful for diagnosing active pulmonary TB, but despite its sensitivity for active TB, its poor specificity can lead to overdiagnosis when used alone. (4,5) Its current utility is to help rule out active TB, when combined with evaluation for clinical symptoms in setting of a positive IGRA or TST, before initiating latent TB therapy.

Returning to our patient's story, his need for LTBI testing should have been stratified by risk from his history, not determined by an incidental finding on a chest x-ray, though it is not unreasonable for a facility to mandate universal TB testing in populations with substance and/or alcohol abuse given the known risks as mentioned previously. If the appropriate algorithms been followed, our patient would not have avoided low value testing, but testing would have been performed at intake and negative results would have been available much earlier, possibly avoiding homelessness, as well as a close-call with an un-necessarily delayed limb-saving procedure.

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