Evidence-based Tuberculosis Diagnosis

One-page plain language summaries of systematic reviews - #14

Title: Interferon-gamma release assays for screening healthcare workers for latent tuberculosis infection

This *systematic review* presents *evidence* from a collection of studies evaluating tests or strategies for the diagnosis of latent tuberculosis infection (LTBI). Terms in *italics* are defined in the Tuberculosis (TB) Evidence Glossary.

Why this review is important: TB has been transmitted in healthcare settings to healthcare workers in virtually every country of the world. TB transmission is most likely to occur from unrecognized TB with the risk for transmission dependent on several factors, such as local prevalence of TB and effectiveness of TB infection control measures. Traditionally, screening for LTBI has been done using the tuberculin skin test (TST). Interferon-gamma release assays (IGRAs) are blood tests that were recently developed as alternatives to the TST to aid in the diagnosis of LTBI. Two IGRAs are in current use: QuantiFERON® -TB Gold In-Tube (QFT-GIT), Cellestis Limited, Victoria, Australia and T-SPOT®.*TB* (TSPOT), Oxford Immunotec, Abingdon, UK. Should IGRAs replace the TST for TB screening of healthcare workers?

Objective: To determine the ability of IGRAs to detect LTBI in healthcare workers. To compare how well TST and IGRAs correlate with occupational exposure. To compare IGRA and TST conversions (negative to positive results over time) and reversions (positive to negative results over time).

Main findings: 44 studies were included in the main analyses: 35 (79%) studies of QFT-GIT or earlier versions, 3 studies of TSPOT and 6 studies of both IGRAs. Only 5 studies were performed in high TB incidence countries. Percentage of BCG-vaccinated healthcare workers ranged from 7% to 100%. TST and IGRA positivity rates were higher (40% to 66%) in high-incidence countries than in low/intermediate-incidence countries (1% to 60%). The positivity rate with IGRAs was lower than that with TST in high-incidence countries (Figure), but was statistically significant only in low/intermediate incidence countries. Both TST and IGRAs were associated with indicators of occupational exposure (care of a TB patient or # years employed as a healthcare worker). In 2 serial testing studies from high-incidence countries, rates of IGRA conversions/reversions were high (12% to 21% and 18% to 40%).

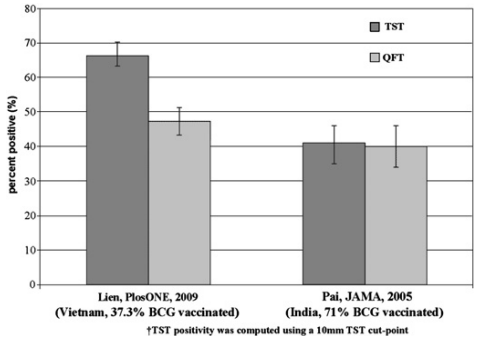

Figure. Studies comparing TST and QFT-GIT positivity in healthcare workers in Vietnam and India. The Vietnam study had a lower rate of BCG vaccination which could explain the lower percent positivity found with QFT-GIT.

Authors' conclusions: The use of IGRAs instead of TST for one-time screening in low-incidence settings may result in fewer positive tests and fewer healthcare workers requiring LTBI treatment. However, until further evidence is available, TB programmes that include repeated IGRA testing must use caution.

Policy implications: Many guidelines and position papers do not make recommendations for the serial screening of healthcare workers (Australia, Czech Republic, Norway, Croatia, Denmark, Germany, UK, Finland and ECDC). Some countries suggest the use of IGRAs only (Slovakia, Japan, the Netherlands, Portugal, and France) or IGRAs as an alternative to the TST (USA, Switzerland, and Italy) for serial healthcare worker screening (see reference #2).

Comments: Studies evaluating IGRAs lack an appropriate reference standard for LTBI. Therefore, before beginning the review, the authors developed a list of reference standards and arranged them in order of importance. Evidence was unavailable for the strongest standards: 1) efficacy of LTBI treatment for preventing active TB based on IGRA results and 2) in individuals with LTBI, the ability of IGRAs to predict active TB (see summary # 14). The authors therefore reviewed studies that used weaker reference standards, such as association between IGRA results and level of occupational exposure or IGRA-TST agreement.

Systematic review: Zwerling A, van den Hof S, Scholten J, Cobelens F, Menzies D, Pai M. Interferon-gamma release assays for tuberculosis screening of healthcare workers: a systematic review. Thorax. 2011 Jan 12.

Publications and other resources of related interest

1. Baussano I Tuberculosis among health care workers. Emerg Infect Dis. 2011 Mar;17(3):488-94. 2.Denkinger CM, Dheda K, Pai M. Guidelines on interferon-gamma release assays for tuberculosis infection: concordance, discordance or confusion? Clin Microbiol Infect. 2011 Jun;17(6):806-14.

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