Cost-effectiveness of implementing the Cy-Tb test to screen latent tuberculosis infection in India

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Policy Brief

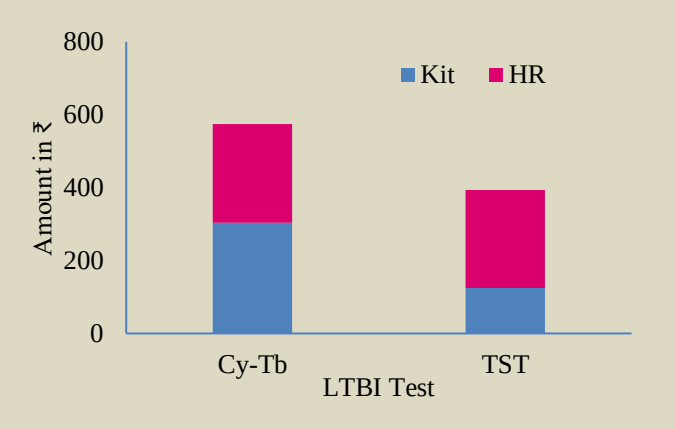
Summary

Latent tuberculosis infection (LTBI) is defined as a state of persistent immune response to stimulation by Mycobaterium tuberculosis (M.tb) antigens without evidence of clinically manifested active tuberculosis (TB). Hence, screening and treatment of LTBI should be an important part of global TB control activities if we want to achieve End TB strategy. WHO recommends systematic screening, identification and treatment of LTBI especially in groups at high risk for developing active TB like people living with HIV, child contacts of pulmonary TB cases, patients other immunosuppression. After ruling out active TB by a symptom screen, individual should be tested for LTBI by either interferon-gamma release assay (IGRA) or tuberculin skin test (TST). TST with purified protein derivative (PPD RT 23) is the routine diagnostic test in most TB high burden countries. Cy-Tb is a novel specific skin test based on ESAT-6 and CFP10 antigens. A cost effectiveness analysis was performed from an Indian healthcare perspective. TST test sensitivity is higher than the Cy-Tb test but when we compare the specificity, Cy-Tb test is more accurate in identifying people without the disease.

Problem Statement

A significant proportion of the Indian population is susceptible to progression to active TB disease from LTBI due to the presence of the risk factors.[1] Diagnosis of LTBI can be done by TST or IGRA. TST is easy to use, but false-positive reactions may occur in individuals vaccinated with Bacille Calmette–Guerin (BCG) vaccine. IGRA is not recommended by the WHO as a TST replacement. Meta analyses have shown that IGRA have demonstrated superior specificity and sensitivity when compared with that of TST.[2] Major disadvantages of the IGRA is that it require high relative cost and the need for an equipped laboratory. Cy-Tb is a highly specific skin test for the diagnosis of LTBI designed to address some of the drawbacks of TST and IGRA.[3] The Cy-Tb test is also unaffected by BCG vaccination. It showed 94% concordance with the IGRA results with similar indurations sizes as the TST.[4] For the incorporation of new technologies to the public health system, local assessments of feasibility, acceptability, and cost-effectiveness are necessary. The cost-effectiveness modelling was conducted primarily from the health system perspective for India which includes costs incurred by the health system i.e. cost of screening and treating the LTBI with Cy-Tb test.[5]

Unit cost per test



Conclusion

Cy-Tb test could be prioritised for household LTBI contact tracing in India. Since Cy-Tb test is more accurate in identifying people without the disease, when comparing to other screening test to diagnose LTBI using a single, universal cut-off unaffected by BCG vaccination.

References

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Key Messages

- Screening and treatment of Latent Tuberculosis Infection (LTBI) should be an important part of global TB control activities if we want to achieve an End TB strategy.
- Available tests for LTBI are IGRA and TST.
- Cy-Tb is the next-generation skin test for detection of LTBI. A new specific skin test is an alternative to Tuberculin Skin Test (TST). The Cy-Tb skin test is applied in exactly the same way as the TST.
- It overcomes the issue of the interaction with BCG vaccine & infection with non-tuberculous mycobacteria seen with the TST.
- The number of false positive cases yielded by Cy-Tb is less, due to non-interference of prior BCG vaccination.
- The number of adverse events are more by TST test screening compared to Cy-Tb test, since the number of false positive detected by TST screening are more which results in over treatment.
- Screening by Cy-Tb would be cost saving, due to less detection of false positive cases.
- Cy-Tb test could be prioritised for household contacts of TB patients for screening LTBI in India.

The policy brief is based upon the Health Technology Assessment of "Assessing the cost-effectiveness of Latent TB Infection Tests (LTBI) in India" and can be found on the link: https://dhr.gov.in/sites/default/ files/