Comparison of Conventional versus Molecular Semi-Quantitative Assay in Presumptive Pulmonary Tuberculosis Cases: A Study from Eastern India

Sir,

India is one of the high tuberculosis (TB) burden countries. According to WHO global TB report 2018, India accounts for one-fourth of the global TB burden with an estimated 2.79 million incident cases.\(^1\) Measurements of bacillary load have an important role in TB diagnostics. Semi-quantitative or quantitative measures of *Mycobacterium tuberculosis* bacilli present in pulmonary samples have been useful for determining severity of the disease, assessing risk of transmission or monitoring treatment response.\(^2,3\)

The present study aimed at comparative analysis of two assays used for semi-quantitation of bacillary load in presumptive pulmonary TB cases: Conventional (smear microscopy i.e., Ziehl Neelsen staining) and molecular (Xpert MTB/ RIF assay). From February to July 2018, a total of 288 sputum samples were processed for both the assays. The Xpert MTB/RIF grading of very low (28 < C\(_t\) < 38), low (22 < C\(_t\) < 28), medium (16 < C\(_t\) < 22) and high (C\(_t\) ≤ 16) were compared with acid-fast bacilli (AFB) smear grading of negative and scanty, ≤1+, ≥1 + and ≥ 2+ respectively.\(^4\) Spearman correlation test was used to calculate correlation between the two grading methods. \(P < 0.05\) was considered significant.

Out of 288 sputum samples, four (1.4%) found to be *Nontuberculous Mycobacteria* by culture and MPT64 antigen detection method were excluded from the analysis. Out of 284 samples, *M. tuberculosis* was detected in 72 (25.3%) by the Xpert MTB/RIF assay, of which 47 (65.3%) could be detected by AFB smear microscopy.

The result for comparison of the Xpert MTB/RIF grading and AFB smear grading is described in Table 1. The Xpert MTB/RIF grading was found to have strong correlation with AFB smear grading (correlation coefficient 0.73, \(P < 0.001\)).

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Conflicts of interest
There are no conflicts of interest.

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### Table 1: Comparison of the Xpert MTB/RIF grading with acid-fast bacilli smear grading

| Xpert MTB/RIF result | Negative | Scanty | 1+ | 2+ | 3+ | Total, n (%) |
|----------------------|----------|--------|----|----|----|--------------|
| Positive: Very low (28< C<38) | 12 (92.3) | 1 | 0 | 0 | 0 | 13 (18.1) |
| Positive: Low (22< C<28) | 11 (50.0) | 2 (9.1) | 8 (36.4) | 0 | 1 | 22 (30.5) |
| Positive: Medium (16< C<22) | 2 | 3 | 9 (30.0) | 7 (23.3) | 9 (30.0) | 30 (41.7) |
| Positive: High (C≤16) | 0 | 0 | 2 | 1 (14.3) | 4 (57.1) | 7 (9.7) |
| Negative | 212 | 0 | 0 | 0 | 0 | 212 (74.6) |
| Total | 237 (83.4) | 6 (2.1) | 19 (6.7) | 8 (2.8) | 14 (5.0) | 284 |

The Xpert MTB/RIF grading was found to have strong correlation with AFB smear grading (correlation coefficient 0.73, P<0.001). AFB: Acid-fast bacilli

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