

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 ($C_t \leq 16$) were compared with acid-fast bacilli (AFB) smear grading of negative and scanty, $\leq 1+$, $\geq 1+$ and $\geq 2+$ 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	AFB smear result					Total, n (%)
	Negative	Scanty	1+	2+	3+	
Positive: Very low ($28 < C_i < 38$)	12 (92.3)	1	0	0	0	13 (18.1)
Positive: Low ($22 < C_i < 28$)	11 (50.0)	2 (9.1)	8 (36.4)	0	1	22 (30.5)
Positive: Medium ($16 < C_i < 22$)	2	3	9 (30.0)	7 (23.3)	9 (30.0)	30 (41.7)
Positive: High ($C_i \leq 16$)	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

REFERENCES

1. World Health Organization. Global Tuberculosis Report. Geneva, Switzerland: World Health Organization; 2018.
2. Palaci M, Dietze R, Hadad DJ, Ribeiro FK, Peres RL, Vinhas SA, *et al.* Cavitory disease and quantitative sputum bacillary load in cases of pulmonary tuberculosis. *J Clin Microbiol* 2007;45:4064-6.
3. Perrin FM, Woodward N, Phillips PP, McHugh TD, Nunn AJ, Lipman MC, *et al.* Radiological cavitation, sputum mycobacterial load and treatment response in pulmonary tuberculosis. *Int J Tuberc Lung Dis* 2010;14:1596-602.
4. Blakemore R, Nabeta P, Davidow AL, Vadwai V, Tahirli R, Munsamy V, *et al.* A multisite assessment of the quantitative capabilities of the Xpert MTB/RIF assay. *Am J Respir Crit Care Med* 2011;184:1076-84.

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