Performance of Xpert MTB/RIF in Induced Sputum Samples at Detecting *Mycobacterium Tuberculosis*

To the Editor—In the 1 April 2014 issue of *Clinical Infectious Diseases*, Sohn et al [1] evaluated the performance of the Xpert MTB/RIF assay at a pulmonary referral center in Montreal, a city with low tuberculosis incidence. The investigators found that the overall sensitivity of the test was 46%, compared with mycobacterial cultures. The article and the accompanying editorial question whether the poor performance of Xpert MTB/RIF is due to the use of induced sputum specimens, instead of expectorated specimens or concentrated specimens. In his editorial, Dr Max Salfinger recommends additional studies to assess the validity of using unconcentrated induced sputum [2].

I would like to point the authors and the readers to an article published in *Lancet Respiratory Medicine* [3]. This study evaluated the performance of expectorated sputum following instructions by a healthcare worker or induced sputum in patients suspected of tuberculosis who have smear-negative or smear-scarce sputum samples. The primary endpoint was starting tuberculosis therapy within 8 weeks of enrollment, and one of the secondary endpoints was case detection by diagnostic method: culture yield, smear microscopy, and Xpert MTB/RIF. The performance of Xpert MTB/RIF was comparable between groups with expectorated sputum and induced sputum (13/89 [15%] vs 20/138 [14%]; P = .98). Although the study was conducted in South Africa, an area with high tuberculosis incidence, the patient group selected for the study is comparable to the patient group evaluated in Montreal in terms of preponderance of smear-negative disease. Hence at least from one study, there is reassurance that induced sputum performs comparably to expectorated samples when tested by Xpert MTB/RIF assay.

**Note**

*Potential conflicts of interest.* Author certifies no potential conflicts of interest.

The author has submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.
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References


Reply to El Sahly

To the Editor—We appreciate the response from Dr El Sahly to our study [1], referring to the South African study [2] that we mentioned in our article, however, without a citation (ie, as preliminary results only). This study suggests an overall low sensitivity of the Xpert MTB/RTF assay in patients with sputum-scarce or smear-negative tuberculosis and a slightly lower sensitivity in induced sputum: 4 of 7 (57%; 95% confidence interval [CI], 20%–94%) sensitivity on expectorated sputum and 8 of 16 (50%; 95% CI, 26%–75%) on induced sputum. This result is comparable to the result in our study from Montreal with induced samples (46% sensitivity; 95% CI, 26%–67%) [1]. Smear microscopy in the study by Peter et al yielded a positive result in 22 patients, but Xpert results are not reported by smear result [2]. Overall, the sample size is too small to draw conclusions from this study regarding Xpert sensitivity in induced sputum samples.

Another source of information on the performance of Xpert in induced sputum is the package insert, which reports a sensitivity of 40% (4/10; 95% CI, 16.8%–68.7%) for smear-negative, induced sputum, and this is lower than the pooled meta-analysis estimate of 68% in smear-negative, culture-positive cases (with a majority of the data derived from studies with expectorated samples) [3].

It is conceivable that the dilution of the sample in the process of sputum induction results in a small number of bacilli in the Xpert cartridge, which results in the lower sensitivity of Xpert in induced sputum, particularly in the absence of a concentration step. However, unless a study is performed where expectorated sputum and induced sputum from the same patient are compared head-to-head, a definitive conclusion is difficult. Such direct comparisons can control for a key confounder: Induced samples are more likely to be used in patients with less severe or no symptoms, and such patients may also be likely to have minimal, smear-negative disease. However, such a study might not be considered ethical given the possible concentration of induced sputum samples is yet to be clearly standardized.

Note

Potential conflicts of interest. M. P. serves as a consultant for the Bill & Melinda Gates Foundation. C. M. D. reports no potential conflicts.

Both authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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