2103. Detection of KatG/inhA Mutation to Guide Isoniazid and Ethionamide Use for Drug-resistant Tuberculosis

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Background. Both Mozambique and Brazil are countries with a high burden of tuberculosis. Isoniazid (INH) is one of the cornerstones of tuberculosis treatment and, depending on the mutated gene (*katG* or *inhA*), the organism may be susceptible to high doses of INH (*inhA* mutation) or to ethionamide (-Eth-*KatG* mutation).

Methods. To analyze isoniazid genotypic resistance profile in *Mycobacterium tuberculosis* to guide decision making about management of resistant tuberculosis. Descriptive study of 311 *M. tuberculosis* isolated from Ribeirão Preto, Brazil (2011–2014) and 155 isolates from Beira, Mozambique (2014–2015). Drug resistance patterns and the specific genes mutations were determined using *Genotype MTBDRplus* (Hain Lifescience GmbH, Germany).

Results. Mutations in *katG* gene were detected in 13/22 (59%) of Brazilian and in 32/38 (84.2%) of Mozambican isolates. Unique *inhA* mutations were observed in 8/22 (36%) isolates in Brazil and 4/38 (10.5%) in Mozambique. Both *katG* and *inhA* mutations where detected in 1/22 (5%) and 2/38(5.2%), respectively. katG mutations were more frequent among INH previously treated patients.

Conclusion. There is a geographical variation of INH mutations and the new molecular tests can be used to guide and accelerate decision making towards the use of ETH or high doses of INH based on detected mutations.

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2104. Does Disseminated Nontuberculous Mycobacterial Disease cause False-positive Determine TB-LAM Lateral Flow Assay Results?

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Background. The Determine TB-LAM (LF-LAM) can detect lipoarabinomannan, a glycolipid found in mycobacteria, in the urine of HIV-infected patients with disseminated TB. Whether disseminated nontuberculous mycobacterial (NTM) infection causes false-positive results has not been adequately assessed.

Methods. We retrospectively reviewed the LF-LAM results and the evidence for tuberculosis (TB) coinfection among HIV-infected subjects with microbiologically confirmed disseminated NTM infection seen by the infectious diseases consultation service at a tertiary hospital in Johannesburg, South Africa.

Results. 26 patients had disseminated NTM infection, and 83 mycobacterial cultures and Xpert MTB/RIF assays were performed on these patients. All patients had specimens collected from a minimum of two different sites (e.g., blood and sputum), and the median number of specimens taken per patient was three. On the basis of this, three subjects were diagnosed with TB-NTM coinfection. LF-LAM was performed on 23 out of 26 subjects with disseminated NTM disease, and was positive in 21 cases (91.3%, 95% CI 73.2–97.6). Excluding subjects in whom TB coinfection was diagnosed, LF-LAM was positive in 19/21 cases (90.5%, 95% CI 71.1–97.4).

Conclusion. Our study revealed an unexpectedly high rate of LF-LAM positivity in patients with disseminated NTM infection. While it cannot be definitively determined whether these findings represent undiagnosed concomitant disseminated TB infection, cross-reactivity with NTM antigens, or a combination of the two, it is plausible that NTM cross-reactivity may account for at least some of the positive LF-LAM results seen in this study. *In vitro* studies have suggested this possibility, but previous studies assessing LF-LAM's specificity have enrolled patients whose median CD4 counts were too high to have been at substantial risk for disseminated NTM infection. To the degree that these findings can be confirmed in similar high-burden TB-HIV coinfection settings, they suggest that positive LF-LAM results should be interpreted with caution in patients with very low CD4 counts.

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2105. Evaluation of the High Indeterminate Rate of the QuantiFERON®-Tb Gold In-Tube Assay in a Children's Hospital

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Background. The QuantiFERON®-Tb Gold In-Tube (QFT) assay is an in vitro diagnostic test for *Mycobacterium tuberculosis*infection. We observed a high indeterminate rate among inpatients at Steven and Alexandra Cohen Children's Medical Center of New York. We hypothesized this was caused by incorrect specimen collection. We educated healthcare workers in proper collection techniques and studied the effect on the indeterminate rate.

Methods. We recorded the results of the QFT test for pediatric inpatients from November 2012 to December 2016 from a laboratory specimen log. Beginning in April 2015, multimode education was implemented using an instructional card that accompanied the QFT tubes, presentations, and an instructional video. We used an electronic survey to assess knowledge of healthcare workers before and after the education intervention. We abstracted demographic, clinical, and laboratory factors to analyze correlation with the indeterminate rate.

Results. There were 216 subjects, 101 during the pre-education period and 115 during the post-education period. Ninety-three (43.1%) were indeterminate, 8 (3.7%) were positive, and 115 (53.2%) were negative. There was no significant difference in indeterminate result rate between pre and post-education groups, 46% and 40%, respectively ($P = 0.33$). In a multivariable model of factors associated with an indeterminate result, there was no significant association with education ($P = 0.86$), immunocompromised status ($P = 0.6009$), or comorbidities ($P = 0.15$). Age ($P = 0.0007$), absolute lymphocyte count (ALC) ($P = 0.0016$), and recent receipt of immunosuppressive medication (IS) ($P = 0.0001$) were significantly associated with an indeterminate result. Among those surveyed after the education period there was a significantly higher proportion of persons who received training ($P < 0.0001$), reported shaking the tubes after blood inoculation ($P < 0.0001$), and reported using a waste tube before collection ($P < 0.0001$) compared those surveyed prior to the education period.

Conclusion. Although education resulted in an increase in knowledge of correct specimen collection, the indeterminate rate remained high. Younger patient age, recent receipt of IS, and lower ALC are factors associated with an indeterminate result.

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2106. Utilization and Performance of a Laboratory Developed Nucleic Acid Amplification Test for the Diagnosis of Pulmonary and Extrapulmonary Tuberculosis in a Low Prevalence Area: A 14 Year Study

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Background. Tuberculosis (TB) is a significant global health problem. Nucleic acid amplification tests (NAATs) are valuable in reducing delays to initiation of therapy and infection control protocols. A retrospective study was performed to assess the utilization and performance of a laboratory developed *Mycobacterium tuberculosis* complex (MTBC) PCR assay (TBPCR) for diagnosis of pulmonary (PTB) and extrapulmonary (EPTB) tuberculosis.

Methods. Study site was a 4 hospital system in suburban Chicago. All culture confirmed TB specimens with complete laboratory data from January 2002 to December 2016 were included. Patient records were accessed using an electronic data warehouse, following approval from Institutional Review Board. Standard microbiology procedures were followed for smear and culture of MTBC. A lab-developed real time PCR targeting a 123 bp region of the IS6110 insertion sequence of MTBC was performed on smear positive specimens or if ordered by physician. Clinical and laboratory data was compared with TBPCR results for all culture confirmed cases.

Results. There were 151 culture positive patients and 2186 TBPCR performed. Median age of patients at diagnosis was 49 years (IQR 33–66), 74 (49%) were female and 14 were on immunosupressive therapy. The mean number of samples tested per patient was 2. Of culture positive specimens, 59% were from a respiratory source and 3 were MDR; ordering of TBPCR was higher in specimens from PTB source (58.4%) as compared with EPTB source (37%). Combined sensitivity of the TBPCR on all specimen types was 86.6% (95% CI 76.3–93.1); 90.3% for PTB specimens alone (95% CI 78.2–96.4). Specificity was 100% (95% CI 99.5–100), PPV 100% (95% CI 90.5–100%) and NPV 99.5% (95% CI 98.8–99.8%), and were similar for all specimen types. Sensitivity of TBPCR was 97% in smear positive and 79% in smear negative PTB specimens. The median time to culture positivity was 7 days longer in specimens that were TBPCR negative compared with those that were positive (*P = 0.14, NS),* however, TBPCR shortened time to diagnosis by 13 days.

Conclusion. We found TBPCR to be underutilized in both PTB and EPTB although it was found to be a rapid and reliable method for early diagnosis. Education regarding utility of NAATs could be useful in low burden areas where paucibacillary disease is more common, especially in EPTB.

Disclosures. **All authors:** No reported disclosures.

2107. Correlation of Specific Mutations in Line Probe Assay (LPA) and Drug Susceptibility Test (DST) with respect to Fluoroquinolone Resistance in Drug Resistant *Mycobacterium tuberculosis*

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