Introduction

• Molecular tests for Mycobacterium tuberculosis provide sensitive and rapid diagnosis of TB.
• Implementation of these tests in resource-poor settings has been limited due to logistic challenges, lack of skills, and higher cost.
• PrimeStore Molecular Transport Medium® (PS-MTM) preserves bacterial DNA and allows transport of sputum samples to a centralized facility for molecular testing.¹
• We compare molecular testing of sputum samples collected in PS-MTM with smear microscopy and Xpert® MTB/RIF® for diagnosis of TB in rural South Africa.

Material & methods

• Sputum samples were selected from a prospective study in which two specimens were collected from patients with cough ≥2 weeks (Fig. 1) at primary healthcare facilities in rural Mopani District, South Africa.²
• Shortly after expectoration and before processing by either Xpert® or Ziehl-Neelsen smear microscopy and liquid culture, about 100 µL of sputum was transferred from each specimen into PS-MTM tube using a flocked swab.
• Samples were transported at ambient temperature to the University of Pretoria where they were recoded and transported by air to a central laboratory in San Antonio, Texas, USA, for blinded molecular testing.

Results

• The 132 samples included in this analysis were positive by microscopy (n=23), liquid culture (n=38) or PM-PCR (n=44); two samples had an indeterminate result in PM-PCR (C, value 38-40).
• There was high concordance of PS-MTM/PM-PCR with positive result in smear microscopy (96%); another 22/107 (21%) of smear microscopy negative samples were PM-PCR positive (Tab 1).
• Concordance between PS-MTM/PM-PCR and positive Xpert result was 85% (33/39); another 11/91 (12%) Xpert negative samples were tested positive in PM-PCR.
• Detection of M. tuberculosis by PS-MTM/PM-PCR was significantly more frequent than by microscopy (p<0.001) but similar to Xpert (p=0.33).

Discussion & conclusion

• Molecular tests of sputum samples from rural areas can successfully be performed at centralized laboratories after transport in PS-MTM.
• Such a diagnostic system would enhance detection of Mycobacterium tuberculosis smear microscopy and could provide an alternative to laboratory-based Xpert as baseline test.
• An advantage of the PS-MTM/PM-PCR system is that only partial volume is used in the initial test allowing for further molecular testing if indicated.

References / Notes


The Anova Health Institute NPC is supported by the US President’s Emergency Plan for AIDS Relief (PEPFAR) program via the US Agency for International Development (USAID) under Cooperative Agreement No. AID-674-A-12-00015.

The views expressed in this poster do not necessarily reflect those of PEPFAR or USAID.