String test: a new tool to diagnose tuberculosis in patients unable to produce sputum

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Background
Diagnosis of pulmonary tuberculosis (PTB) requires good quality of sputum specimen. The use of the intra-gastric String Test (ST) has been proposed as an alternative specimen collection method for diagnosis of pulmonary tuberculosis (PTB) in patients unable to produce sputum. We compared the TB detection rate of the ST and the sputum induction (SI) in a series of adult patients presenting with PTB suspicion at the Mbarara Regional Referral Hospital in Uganda.

Methods
Two ST and SI were performed in adult PTB suspects defined by at least 2 weeks cough, chronic unexplained weight loss or fever. We used the paediatric Entero-test® (HDC corporation, USA), that is a gelatine capsule containing a 90 cm coiled nylon string, after a 2 hours fasting and with 2 hours of intra-gastric down time. The SI was performed after the ST with 5% saline for 20 minutes. LED-fluorescence microscopy, Lowenstein-Jensen and MGIT TB cultures were performed in all specimens.

Results
From March 2010 to December 2011, 195 PTB suspects were enrolled. Median age was 34 years, 53% were female and 58% HIV infected. There were 3 (1.5%) ST and 25 (12.8%) SI failures. 174 patients had at least one ST and one SI result. 23 (13.2%) and 22 (12.6%) were smear positive on ST and SI, respectively (p= 1.0). Using combined LJ and MGIT cultures, TB was detected in 39/172 (22.7%) patients using the ST compared to 41/172 (23.8%) with SI (p= 0.69). In HIV infected patients, 10/94 (10.6%) patients were smear-positive using ST versus 10/94 (10.6%) using SI (p= 1.0). There 17/91 (18.7%) culture positive patients with ST versus 19/91 (20.9%) with SI (p= 0.50).

Conclusions
The TB detection rate using ST was comparable to that of the SI irrespective of the HIV status. The ST is more feasible with less nosocomial risk compared to the SI and seems well adapted to low resource setting.

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