Improving diagnosis of pulmonary Tuberculosis in resource-limited settings.

Werner Maokola[1] Luis Cuevas[1] and Lovetti Lawson[2]

[1]Liverpool School of Tropical Medicine, UK
[2]Zankli Medical Centre, Abuja Nigeria

Introduction

- Ziehl-Neelsen (ZN) microscopy; the main diagnostic tool for Tuberculosis (TB) in developing countries

- Effective application of ZN is faced with:
  - Low sensitivity especially in paucibacillary TB (HIV, children)
  - Multiple visits to complete diagnosis

- There is an increasing need to improve sputum smear microscopy and develop new diagnostic methods for TB

Objectives

- To evaluate the efficiency of a “front-loading” sputum method (spot-spot-morning) in comparison with “standard” (spot-morning-spot)

- To determine the incremental yield of the third sputum examination in ZN and Light Emitted Diode-Fluorescent (LED-FM) microscopy

Objectives ....

- To compare the performance of LED-FM, ZN and Lipoarabinomannan (LAM) ELISA test in urine for TB diagnosis

- To determine the time taken for slide examination in both LED-FM and ZN microscopy

Methods

- Cross sectional study in Wuse General Hosp between March and April 2008
- Individuals > 18 years with clinical suspicion of TB completed a structured questionnaire
- Sputum samples were collected on the spot and 1 hour later on day 1 then in the morning at home and the last one after arriving at the hospital on day 2
- Urine samples were collected consecutively to all patients
- Sputum and urine samples were analysed in UK and Zankli Medical Centre research laboratory in Nigeria respectively

Results

- Examination of the first 2 specimens in ZN identified 92% in front-loading scheme and 96% in standard scheme (P=0.07)

- Examination of the first 2 specimens in LED-FM identified 78% in front-loading scheme and 92% in standard scheme (P=0.005)

- Overall LED-FM had highest proportion of TB positive individuals (45%) than ZN (20%) and LAM-ELIZA (14%)

Results ....

- LED-FM used less time (Mean: 3 minutes & 33 seconds, Range: 5 seconds to 7 minutes & 47 seconds) for TB diagnosis in comparison with ZN (Mean: 3 minutes, Range: 20 seconds to 6 minutes)

Discussion

- Examination of the first 2 sputum sampies yielded better in ZN than in LED-FM
- Examination of the first 2 sputum samples yielded the same for front-loading scheme and standard scheme more in ZN
- LED-FM identified more positive TB patients than ZN and LAM ELIZA
- LED-FM used less time for sputum slide examination

Conclusion

- Examination of the first 2 sputum samples and Front-loading scheme can shorten TB diagnosis

- LED-FM microscopy is a promising tool for TB diagnosis

Future perspectives

- Efficiency and feasibility of LED-Fm and LAM-ELISA need to be evaluated for wide application

- More efforts have to be made to improve TB diagnosis especially in paucibacillary