The 39th IUATLD World Conference on Lung Health

LATE-BREAKER SESSION ON TUBERCULOSIS

Monday, 20 October 2008, 08:45–11:15, Bordeaux Room

Paris, France

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

The 39th IUATLD World Conference and CDC Late-Breaker Session on Tuberculosis

Monday, 20 October 2008, 08:45-11:15, Bordeaux Room

The 39th Union World Conference on Lung Health and the Centers for Disease Control and Prevention, Atlanta, Georgia, USA are pleased to co-sponsor the TB Late-Breaker Session. The session will feature 10 interesting presentations from around the world. Each presentation will be 10 minutes in length, followed by 5 minutes discussion time. Copies of the presentation abstracts will be available at the session. We look forward to seeing you there and to having a stimulating discussion around these issues.

With our regards,
Margarita Elsa Villarino, MD, MPH
Philip LoBue, MD, FACP, FCCP
Edward A. Nardell, MD

Centers for Disease Control and Prevention &
International Union Against Tuberculosis and Lung Disease

Time	Title	Presenter
08:45-08:55 am	A simple colour test for diagnosing DRTB & XDRTB under field conditions	Herrera B, Ramos E, Gilman RH, Grandjean L, Martin L, Alvarado J, Valencia T, Quino W, Sandhu G, Alva J, Sosa R, Carrera S, Coleman D, Mitchison D, Evans CA (Peru/UK)
09:00-09:10 am	Prevalence of tobacco use among TB DOTS-Patients in Cambodia: relevant findings for tobacco and TB control	Saint S, Mao TE, Yel D, Ramon Pardo P, Kennedy R, Onozaki I, Nobukatsu I, Keut P, Jimba M (Cambodia)
09:15-09:25 am	Early mortality in adults treated for pulmonary tuberculosis in Blantyre, Malawi	Banda P, Waitt C, Heyderman RS, Oosterhout J, Pirmohamed M, Squire SB (Malawi/UK)
09:45-09:55 am	Drug resistant tuberculosis in Brazil: a national survey, 2006-2008	Braga JU, Oliveira Garrett D, Badaró Moreira Pianissolla MG, Werneck AB, Hijjar MA, Rodrigues R, Barreira D (Brazil/USA)

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A simple colour test for diagnosing MDRTB & XDRTB under field conditions

Beatriz Herrera[1], Eric Ramos[1], Robert H. Gilman[1,2,3], Louis Grandjean[2], Laura Martin[2], Jessica Alvarado[1,2], Willi Quino[1], Gurjinder Sandhu[1,2], Jessica Alva[1,2], Rosario Sosa[1,2], Silvia Carrera[1,2], David Coleman[4], Denis Mitchison[4], Carlton A. Evans[1,2,3,5]

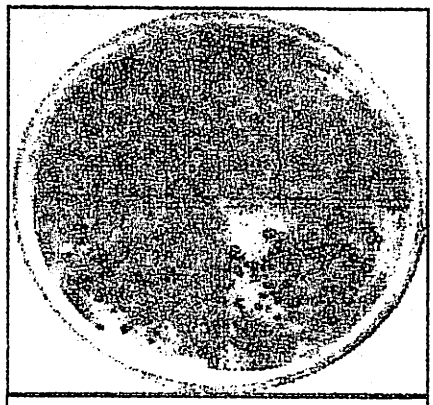
[1]Universidad Peruana Cayetano Heredia, Lima, Perú; [2]Asociación Benefica Prisma, Lima, Perú; [3]Johns Hopkins Bloomberg School of Hygiene & Public Health, USA; [4]St. George's Hospital Medical School, London, UK; [5]London School of Hygiene & Tropical Medicine, UK.

Background: The complexity and biohazard of conventional procedures largely restricts the use of TB culture and drug-susceptibility testing to reference laboratories. Thus sensitive TB, MDRTB and XDRTB diagnostics are infrequently available to patients in resource-poor settings who have greatest need for them.

Objective: To optimize safe sputum processing and culture for TB diagnosis and drug susceptibility testing for basic field laboratories in resource-poor settings.

Methods: Patients with suspected pulmonary TB expectorated into sputum pots containing disinfectant transport medium that liquefied and decontaminated sputum during transit. The sputum samples took between 6 hours and 5 days at room temperature to reach the laboratory. On arrival in the laboratory, the contents of the sputum pot were applied directly without any processing to each quadrant of a culture plate. The culture plate contained a transparent thin-layer of 7H11 agar made selective with antimicrobials to prevent contamination and also incorporated a colour-change indicator to detect positive cultures. Direct drug susceptibility testing for isoniazid, rifampicin and ciprofloxacin was also carried out concurrently in the other quadrants of the same culture plate. Immediately after sputum application, the culture plates were closed, double-sealed and incubated. Positive cultures were identified by naked-eye examination for colour change and M. tuberculosis was further confirmed by examining the areas of colour change within the sealed plates under a microscope with a 4x objective. For comparison, the same patients expectorated another sputum sample into a normal dry pot that was processed by the gold-standard Centres for Disease Control reference laboratory technique utilising N-acetyl l-cysteine NaOH decontamination with centrifugation, vortex re-suspension and culture on 7H11 agar.

Results. For 385 sputum samples cultured by both methods, 149 were culture-positive for *M. tuberculosis* by one or both methods, 49% of which were also smear microscopy positive. The sensitivity of the novel test was 91%, significantly more sensitive than the conventional centrifuge decontamination method (74% diagnostic sensitivity, p=0.0001) and yielded significantly more colonies (p<0.0001). The median estimated time to culture positivity with concurrent drug-susceptibility testing was 16 days, slightly faster than the centrifuge-decontamination method (p<0.01). Contamination resulted in the loss of 3.6% and 1.0% of test results, respectively (p=0.02). Processing 30 fresh sputa with the novel test took less than an hour, required less training and involved a similar sample processing bio-hazard to sputum smear microscopy, after which cultures were permanently sealed. In contrast, standard centrifuge decontamination took several hours, required specialized skills and risked biohazardous aerosol formation. The colour test materials cost ~$1 and utilized standard laboratory equipment (a normal incubator and a conventional microscope).



MDRTB growth (red dots) is visible in the detection (clear), isoniazid (green), & rifampicin containing (yellow) quadrants Ciprofloxacin (blue) prevented TB growth, ruling out XDRTB.

Conclusions: This simple colour-change technique allows safe, inexpensive and sensitive TB diagnosis with concurrent testing for MDRTB and screening for XDRTB in basic field-level laboratories. This has the potential to make modern TB diagnostics more widely accessible in resource-poor settings, increasing equity in TB diagnosis.

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Background: C
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TB services, and