Screening HIV patients for tuberculosis using MODS: A blanket or targeted approach?

Hollm-Delgado M, Caviedes L, Gilman R, Checkley W, Vivar A, Sanchez E, Pinedo Y, Friedland J, Evans C, Moore D.

Learning Objectives: By the end of the presentation, participants will learn about current difficulties in diagnosing tuberculosis among HIV-infected individuals living in the developing world, and be able to consider whether targeted versus blanket screening with MODS should take place among hospitalized HIV in-patients living in high TB burden settings.

Background: Tuberculosis is a leading cause of opportunistic infections among HIV-infected individuals in developing countries. Diagnosing tuberculosis continues to be a major challenge since HIV often modifies the typical clinical presentation. In developing countries, where 95% of tuberculosis cases occur, diagnosis is further complicated by the limited availability of sensitive culture-based laboratory diagnostics. In recent years, the Microscopic Observation Drug Susceptibility (MODS) assay has been shown to detect *Mycobacterium tuberculosis* and its drug susceptibility status in sputum samples more rapidly and efficiently than current standards of diagnosis yet at one-tenth the cost of gold-standard rapid assays. In this study, we examine how the high laboratory performance of MODS translates into clinical utility when screening hospitalised HIV-infected patients for active pulmonary tuberculosis, and determine whether MODS screening can be targeted to pre-selected sub-groups of patients.

Design/Methods: Between March 2003 and June 2004, 150 consecutive newly hospitalised HIV-positive patients not diagnosed with tuberculosis were recruited and prospectively screened for pulmonary tuberculosis using current national diagnostic algorithms. This included clinical examination, chest radiography and sputum microscopy. Sputum and/or gastric samples were cultured for tuberculosis using MODS, Lowenstein-Jensen and automated MBBacT.

Results/Outcome: 94%(141/150) patients had CD4 counts ≤200 cells/uL. 3%(5/150) had cough with at least one constitutional symptom. Currently recommended diagnostic algorithms detected only 39%(11/28) of tuberculosis patients and misclassified 57%(16/28) as being tuberculosis-free. Culture-based screening all patients with MODS identified 96%(27/28) of tuberculosis cases (i.e., 16 patients more than with current national diagnostic algorithms). Targeting MODS screening to 93%(139/150) of HIV-infected patients with negative sputum microscopy would have identified 96%(27/28) of patients with pulmonary tuberculosis. Alternatively, by restricting MODS screening to 62% patients who were sputum microscopy-negative and who had cough at the time of admission, 93%(26/28) of patients with pulmonary tuberculosis would have been diagnosed. Modelling suggested that this increased efficiency from targeting MODS would be greatest in settings with lower tuberculosis prevalence.

Conclusions: Active pulmonary tuberculosis was common among hospitalised HIV-infected patients. However, it often missed using currently recommended diagnostic algorithms by the Peruvian Ministry of Health. Although blanket screening with MODS diagnosed a large proportion of patients with pulmonary tuberculosis, our results indicate that targeted screening had similar sensitivity. Culture-based MODS testing is recommended for smear-negative HIV-infected patients who were coughing at time of admission.

Partners: A.B. PRISMA; Johns Hopkins Bloomberg School of Public Health - Department of International Health, Johns Hopkins School of Medicine- Division of Pulmonary and Critical Care; Universidad Peruana Cayetano Heredia; Université de Montréal, Wellcome Centre for Clinical Tropical Medicine

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