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


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-inpatients 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.

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