## Retinal Examination Can Help Identify Disseminated Tuberculosis in Patients With HIV/AIDS

To the Editor—We were surprised to see that the recent article by Crump et al on bacteremic disseminated tuberculosis in sub-Saharan Africa [1] overlooked the value of retinal examination in detection of disseminated tuberculosis. Unfortunately, inattention to eye manifestations

**Table 1. Choroidal Tuberculosis in 192 Patients Who Underwent Eye Examination After Routine Screening for Tuberculosis**

| Tuberculosis Status Based on Prior Routine Screening | Patients, No. (%) | |
|---|---|---|
| | Total Examined | Choroidal Tuberculosis |
| Receiving tuberculosis treatment | 108/192 (56) | 5/108 (4.6) |
| Prior negative tuberculosis screening result | 84/192 (44) | 5/84 (6.0) |

Of these patients, 46% had clinical stage 3 and 48% had clinical stage 4 disease (World Health Organization staging), and the median CD4 cell count was 39 cells/μL; 127 patients were female, and 65 were male, with a median age of 22.5 years.

of tuberculosis is all too common, including in World Health Organization (WHO) guidelines [2], despite having been acknowledged by Sir William Osler more than a century ago [3].

Detecting choroidal tuberculosis by indirect ophthalmoscopy allows for an easy and rapid diagnosis of disseminated tuberculosis in a meaningful number of patients with human immunodeficiency virus (HIV) infection and low CD4 cell counts. We explored the feasibility of this strategy in a prospective clinical series of 192 patients from southern Africa (Lesotho, 18 clinics in rural South Africa, plus the urban township of Khayelitsha) (Table 1). Patients were examined by an HIV clinician (M. B.) with prior formal training in indirect ophthalmoscopy, including detection of choroidal tuberculosis. Inclusion criteria consisted of CD4 cell count <50 cells/μL or WHO clinical stage 4 disease (if CD4 cell counts were unavailable). Indirect ophthalmoscopy through fully dilated pupils was performed after patients had been routinely screened for tuberculosis by symptom complex, sputum smear or culture, or chest radiography. Of note, choroidal tuberculosis was identified in 5 of 84 patients who had prior negative tuberculosis screening results and in whom it subsequently led to a decision to initiate tuberculosis treatment.

Our findings are supported by others: choroidal tuberculosis was identified in 3 (5.7%) of 53 HIV-positive mycobacteremic patients from Malawi [4] and in 6 (60%) of 10 patients with mycobacterial sepsis from Mumbai [5]. In prospective cross-sectional studies, an HIV clinic reported 4 of 17 patients (23.5%) with eye lesions [6], and a general hospital reported 18 of 100 patients (18%) with ocular findings of tuberculosis (11 of 18 patients were HIV positive) [7].

Diagnosis of disseminated tuberculosis in advanced immunodeficiency is difficult because patients often have atypical or normal chest radiographs, and/or sputum that is unobtainable or negative at smear microscopy [1, 8]. Diagnosis is not made until autopsy in up to half of patients [8], and the syndrome is lethal, with almost 50% mortality after about 1 month [1]. In resource-limited settings, with erratic or absent technological support, the challenge is daunting. The article by Crump et al highlights the constraints that exist in resource-limited settings: a CD4 cell count was available for only 31% of bacteremic patients [1].

A harsh reality heightens the importance of making the best use of simple tools, such as physical examination of the retina, commonly neglected because of the perception that it can only be performed by an ophthalmologist and because ophthalmology consultation services in low-resource settings are virtually nonexistent [9]. The solution is "task shifting" to HIV clinicians, the feasibility of which is documented in this letter and in a report from Myanmar, where trained HIV clinicians routinely examine the retina by indirect ophthalmoscopy to detect cytomegalovirus retinitis [10].

Retinal examination is the least costly and most rapid means of establishing a diagnosis of disseminated tuberculosis. It is a point-of-care service that can be implemented on the first visit and allows for early diagnosis in patients with low CD4 cell counts and/or severe illness, who are exactly those at highest risk of death.

## Note

***Potential conflicts of interest.*** All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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