Eye exam with indirect ophthalmoscopy for diagnosis of disseminated tuberculosis in patients with HIV/AIDS

David Heiden, Todd P Margolis, Alan Lowinger, et al.

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To the Editor The choroidal tubercle (figure 1) may be the most common manifestation of ocular tuberculosis (TB), and one of the earliest signs of disseminated infection.[1] Fuchs described the value of eye examination for detection of choroidal tubercles and diagnosis of disseminated tuberculosis in his textbook over a century ago. About half a century later, an autopsy study of miliary tuberculosis in children found that eye examination exceeded chest radiography in diagnostic sensitivity: choroidal tubercles were found in 25/48 (52.1%) of children; positive chest radiography in 18/52 (34.6%).[2]

In the AIDS era, there have been conflicting reports about ocular TB. For instance, in India, a retrospective AIDS case series from a tertiary care eye referral centre in Chennai reported it occurring rarely, in under 2% of patients,[3] whereas, a prospective cross-sectional study from an AIDS clinic in Mumbai reported ocular TB in 23.5% of patients.[4]

Disseminated TB occurs frequently in HIV patients with low CD4 counts, has a high mortality rate, and can be so difficult to diagnose that up to half the cases may not be diagnosed correctly until autopsy.[5] Thus, there is a compelling need for better diagnostic tools.

We propose that eye examination for detection of choroidal TB is a neglected tool, and may provide a rapid way to diagnose disseminated TB in a meaningful number of patients with low CD4 counts, potentially reducing morbidity and mortality. To support this concept, we report the prevalence of choroidal TB in a wide sampling of patients with advanced HIV in resource-poor settings.

METHODS

We retrospectively reviewed the charts of 1137 consecutive eye examinations of HIV/AIDS patients in eight countries (22 different clinical settings). Inclusion criteria were CD4 count <100 cells, or WHO clinical stage 4 disease. A single experienced ophthalmologist trained in uveitis (DH) performed all examinations by dilated indirect ophthalmoscopy, as part of a series of clinical training programs. Because these were not research settings, and there was no access to supporting ophthalmic diagnostic tools or opportunity for clinical follow-up, we conservatively assigned a diagnosis of ocular TB only in patients with characteristic clinical findings, and only if the patient had a prior clinical TB diagnosis. About half of all patients were being treated, or had been treated, for TB.

RESULTS

Choroidal TB was diagnosed in 66/1137 (5.8%) AIDS patients. Fifty-eight of these 66 patients (87.9%) had no visual complaints (table 1).

DISCUSSION

We frequently observed clinical evidence of choroidal TB in HIV/AIDS populations with high TB prevalence. Of particular interest, almost 90% of these patients had no ocular symptoms.

Our findings are consistent with earlier observations that choroidal tuberculosis is a valuable clinical sign of disseminated TB,[1 2 4] and suggests that indirect

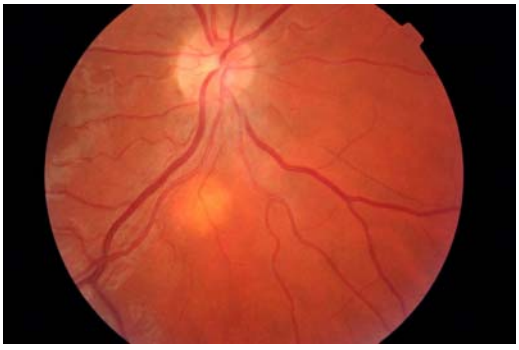

Figure 1 Retinal photograph of a choroidal tubercle from a patient with HIV/AIDS who died of disseminated tuberculosis. This figure is only reproduced in colour in the online version.

Table 1 Choroidal TB with and without eye symptoms in a consecutive series of HIV/AIDS patients in locations of high TB prevalence in eight different countries

Country and year(s)	Patients screened (n)	Patients with choroidal TB (n)	'Subgroup' with eye symptoms
Cambodia (2004, 2008)	140	4	1
Uganda (2005)	35	2	0
South Africa (2005)	84	6	0
Myanmar (2006, 2007, 2008, 2009, 2011, 2012)	536	37	5
Thailand (2006, 2007)	98	2	0
Laos (2007)	33	1	0
China (2008, 2009, 2010)	151	8	0
Russia (2011, 2012)	60	6	1
8 Countries (2004–2012)	1137	66/1137 (5.8%)	8/66 (12.1%)

ophthalmoscopy should be part of the initial basic TB evaluation for patients with low CD4 counts. However, the value of dilated ophthalmoscopic exams to detect disseminated TB needs to be properly evaluated through additional studies in current clinical settings, in which other causes of choroidal lesions could also be assessed. We need to compare standard and new TB diagnostic tests, TB clinical diagnostic algorithms, and indirect ophthalmoscopy supported by retinal photography, in a prospective study in patients who first present with CD4 < 100, or WHO clinical stage 4 disease, prior to initiation of antiretroviral therapy (ART).

Unfortunately, patients with low CD4 counts and high risk of opportunistic infections ('late presenters') continue to be part of the challenge of the HIV/AIDS epidemic in sub-Saharan Africa, Southeast Asia, and Eastern Europe, regions with high TB prevalence. In Myanmar, appropriately trained HIV/AIDS clinicians (non-ophthalmologists) perform dilated indirect ophthalmoscopy for detection of cytomegalovirus (CMV) retinitis as part of routine care.[6] HIV/AIDS patients with disseminated tuberculosis might be diagnosed and treated earlier if, with appropriate training, this physical examination strategy is extended, and careful attention is devoted to detection of choroidal TB at the same time as screening for CMV retinitis.

David Heiden,[1,2] Todd P Margolis,[3] Alan Lowinger,[4] Peter Saranchuk[5]

[1]Department of Ophthalmology, California Pacific Medical Center, San Francisco, California, USA
[2]Seva Foundation, Center for Innovation in Eye Care, Berkeley, California, USA
[3]Francis I. Proctor Foundation, UCSF Medical School, University of California San Francisco, San Francisco, California, USA
[4]Department of Ophthalmology, California Pacific Medical Center, San Francisco, California, USA
[5]South African Medical Unit (SAMU), Operational Centre Brussels (OCB), Médecins Sans Frontières (MSF), Cape Town, South Africa

Correspondence to Dr David Heiden, Department of Ophthalmology, California Pacific Medical Center, San Francisco, CA, USA; Seva Foundation, Center for Innovation in Eye Care, Berkeley, CA, USA; 641 Clayton Street, San Francisco, CA 94117, USA; davidheiden@gmail.com

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Competing interests None.

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Correction notice This article has been corrected since it was first published Online First. David Heiden is now listed as the first author of the paper.

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