this study. HIV-related retinopathy is seen in up to 50% of patients with AIDS in the developed countries,[6] but in this study and others in Africa[7] it was less common. This may be because it is seen more commonly with lower CD4+ counts.[6]

Neuro-ophthalmic manifestations of cerebral disease were a common finding, reflecting the prevalence of cerebral and meningeal infection in HIV in Africa. In contrast no patients had ophthalmic findings consistent with ophthalmic mycobacterial infection, despite the high prevalence of pulmonary tuberculosis.

No cases of cytomegalovirus (CMV) retinitis were seen: it appears to be a rare manifestation of HIV in Africa despite widespread prevalence of CMV in the African population.[8] This would seem to be because many African patients with HIV are dying from diseases such as tuberculosis and bacterial sepsis before CD4+ counts fall to the low levels (< 100/μl) associated with CMV retinitis in the developed world.[9] One recent West African study found a mean CD4+ cell count of 466/μl in patients with AIDS.[10] There were not the means to measure CD4 counts at KCMC; interestingly, and in contrast, in a study from the Ivory Coast patients with HIV were profoundly immunosuppressed, 39% having CD4+ counts less than 50/μl, but ophthalmic disease was not reported.[11] This has led to speculation that early death may not completely explain the differences in CMV retinitis infection seen; however, it may be that once CD4+ counts become less than 50/μl, when the relative risk of CMV retinitis in HIV is multiplied threefold,[12] African patients with AIDS succumb very quickly to acute infections, and CMV retinitis is not seen. None of the patients seen at KCMC had access to antiretroviral treatment: availability throughout Africa is extremely limited, which together with the reduced ability to adequately diagnose and treat opportunistic infections through financial constraint, are reasons for death before severe immunosuppression.

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Sir,

Endogenous *Aspergillus* endophthalmitis occurring in a child with normal immune function

Endogenous *Aspergillus* endophthalmitis is a rare condition which occurs in the context of injecting drug use and various immunodeficiency states.[1] We report an unusual case of this infection, presenting in a young child who had no evidence of underlying immunosuppression.

Case report

A 5-year-old Chinese girl with beta-thalassaemia trait never requiring transfusion was referred 10 days after she developed painless redness of the left eye. Her mother also described a hypopyon level. The referring ophthalmologist had instituted treatment for left panuveitis including topical and oral corticosteroid. There was a history of upper respiratory tract infection 2 weeks prior to the onset of the ocular symptoms, but no history of trauma to the eye.

On presentation, visual acuity was counting fingers at close range in the left eye, and there was a left afferent pupillary defect. The left lids were swollen, and slit lamp examination of that eye revealed marked ciliary injection, no hypopyon, but 3+ aqueous cells with a dense flare, and a thick fibrin pupillary membrane. The left fundus could not be visualised. Right eye examination was normal. There were no signs of ocular trauma. The patient was febrile, but full physical examination was otherwise unremarkable. Ocular ultrasound and CT scan revealed a left retinal detachment, and associated dense vitreous opacity, but no mass lesion or foreign body, and orbital tissues appeared normal.

This severe acute presentation of intraocular inflammation, atypical of childhood uveitis, suggested endogenous infectious endophthalmitis. Pars plana

vitrectomy was performed, limited by the poor fundus view, and intravitreal vancomycin and gentamicin were administered. Intravenous and topical fortified antibiotics were also commenced. A Gram stain of vitreous showed only neutrophils. Although blood cultures remained negative, vitreous cultures grew *Aspergillus fumigatus* within 1 week.

The blood smear indicated mild anaemia, consistent with beta-thalassaemia trait, but white cell indices were normal. CD4- and CD8-positive T cell subset numbers were also normal. The nitroblue tetrazolium slide test was positive, and lymphocyte proliferation responses were good. The patient had normal levels of immunoglobulins G, A and M and complement components C3 and C4, a satisfactory CH50, and non-reactive HIV serology. A chest radiograph and CT scan of the sinuses were unremarkable.

On identification of the *Aspergillus* species a second pars plana vitrectomy was undertaken, with lensectomy, and amphotericin B was injected intravitreally. Treatment with intravenous amphotericin B was begun. *Aspergillus fumigatus* was also isolated from vitreous cultures taken at this time. The intravitreal antifungal injection was repeated after 1 week, and intravenous therapy was continued for 14 days. Subsequently, a 6 week course of oral itraconazole was given. Although resolution of the inflammation was observed, the eye became phthisical with visual acuity of no light perception.

Four years later, the patient remains well, having suffered no further significant systemic or ocular infections.

Comment

The *Aspergillus* species are common environmental moulds, reported to cause endogenous endophthalmitis in rare circumstances. The largest case series was collected at the Bascom Palmer Eye Institute over a 15 year period, and totalled only 10 patients.[2] Susceptible individuals include organ transplant recipients, and patients with malignancy or endocarditis.[1] In these immunocompromised persons, the organism is generally inhaled, and endophthalmitis follows systemic aspergillosis. Injecting drug users also risk developing endogenous *Aspergillus* endophthalmitis,[1] and chronic obstructive pulmonary disease is a newly described association.[2]

The case of endophthalmitis which we report is most unusual, because we were unable to identify any predisposing immunological abnormality in our 5-year-old patient despite comprehensive investigation. Although persons with beta-thalassaemia major may demonstrate moderate abnormalities of lymphocyte numbers and functions,[3] our patient had beta-thalassaemia trait and relevant tests of humoral and cellular immunity were normal. Respiratory entry of the organism is most likely, but she did not suffer from chronic pulmonary or sinus disease. There are two additional published reports of culture-proven endogenous *Aspergillus* endophthalmitis in healthy individuals, both of whom were adults.[4,5] However, that these patients were immunocompetent was presumed on the basis of clinical history and examination, and a blood smear. Detailed studies of white cell subsets, and functional immunological studies including neutrophil, lymphocyte and complement activities, were not undertaken. Furthermore, in older patients, injecting drug use is difficult to exclude.

Typically, endogenous *Aspergillus* endophthalmitis presents acutely, with choroidal invasion followed rapidly by retinal invasion, vitritis and finally anterior uveitis.[1] *Aspergillus* vasculitis may cause exudative retinal detachment due to choroidal thrombosis, as well as retinal necrosis. Although optimal treatment remains uncertain, amphotericin B is the recommended antifungal for *Aspergillus* endophthalmitis, and intravitreal treatment appears essential.[2] As the infection has a propensity for involving the macular region, outcome is often poor, even in those cases detected early.[2] Our patient presented with an advanced infection, and diagnosis was delayed, the condition being previously unreported in a healthy child. After appropriate treatment, it was possible to save her eye, but not the vision.

It is suggested that identifying risk factors will enable prompt diagnosis of this 'rare, but devastating infection'.[2] However, this case report indicates that endogenous *Aspergillus* endophthalmitis may also occur in an otherwise well individual.

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