Combination HIV therapy and opportunistic infections of the eye in people with AIDS

The past 2 years have seen a dramatic improvement in the prognosis for people with HIV infection owing to the success of a strategy of using a combination of antiretroviral drugs to bring about a profound and durable suppression of viral replication. The drugs currently available all work through inhibiting key HIV specific enzymes—reverse transcriptase and HIV protease. The use of a three drug cocktail, usually consisting of two reverse transcriptase inhibitors (RTI) and one protease inhibitor (PI), has shown itself to be superior to single1 and dual2–4 drug therapy in terms of the degree of viral suppression and also the ability to stall the development of resistance.4–7

HIV damages the immune system primarily by promoting the destruction of CD4 T lymphocytes, and this leaves the individual vulnerable to a greater number of infections as the cell numbers decline. Following the instigation of triple combination, highly active antiretroviral therapy, often called “HAART”, most recipients experience a rise in blood CD4 T cell numbers, initially in the first month as a result of a release of cells from the reticuloendothelial system, and thereafter because of the production of new cells.8–9 This rise may occur even in people with quite advanced HIV related immunodeficiency and low CD4 counts. A reduction in the number of opportunistic infections,10–11 including cytomegalovirus (CMV) retinitis,12–13 a reduction in the number of hospital admissions,14 and an improvement in the length15 and quality of life have all been shown to occur in the majority of recipients of HAART. Walsh et al have recently shown a dramatic increase in survival of AIDS patients with CMV retinitis who were treated with HAART.16

Before the era of combination antiretroviral therapy, most serious infections with CMV in HIV infected individuals occurred only once the CD4 T lymphocyte count fell below 100×10⁶/l. Clearly, with the use of combination therapy in those whose CD4 count never falls below 100, there should be no risk of CMV. Those who start combination therapy with CD4 counts below 100×10⁶/l may be vulnerable to CMV disease until their immune system recovers sufficiently. When the point of immunocompetence to CMV is regained is something we are unable to measure at present. This is of even more significance in those AIDS patients with existing CMV disease who start HAART and experience an improvement in immune function that may at some point make it unnecessary for them to continue maintenance anti-CMV treatment (which is often toxic, inconvenient, and expensive).17–18

Van den Horn et al report in this issue of BJ O (p 988) on 15 patients with AIDS related CMV retinitis, who were receiving maintenance therapy with anti-CMV drugs, and who, as would be expected, had very low CD4 T lymphocyte counts. They document the recurrence rate of CMV retinitis in these patients after receiving combination therapy including a protease inhibitor. Recurrences occurred in seven patients all of whom had failed to achieve a rise in their CD4 lymphocyte count above 100×10⁶/l. Those patients who successfully obtained CD4 counts above 100×10⁶/l did not suffer any recurrence of CMV retinitis, and one might speculate that it may be safe for those individuals to stop maintenance anti-CMV therapy.

Paradoxically, the improvement in immune function that follows the instigation of HAART may have its drawbacks. Some patients with CD4 T lymphocyte counts below 50–100×10⁶/l may have hitherto unrecognized and asymptomatic infection with CMV retinitis. As immune function returns, so there is an increased inflammatory response which, in the case of CMV retinitis, results in visual loss and an abnormal funduscopy appearance, often quite different from the classic “pizza pie” or “ketchup and scrambled egg” appearances of CMV retinitis.19–20

The practice of the ophthalmologist looking after people with HIV has changed. The widespread use of HAART has reduced the incidence of CMV retinitis and indeed other opportunistic infections of the eye.21 The enhanced immune function that follows the commencement of HAART may produce unexpected appearances of retinitis with severe inflammation.22 Anti-CMV maintenance therapy may now be necessary only for a few months until immune restoration has occurred,23 but specific tests to gauge an individual’s cell mediated immune function against CMV would be useful to tell when this time has been reached. Additionally, some of the drugs used in the HAART combination may have ophthalmic side effects.

One fear is that the effects of HAART will be temporary, lasting perhaps only a few years, after which we may see CMV retinitis and other opportunistic infections becoming commonplace again.

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Seeing beyond acuity

What are the effects of unioocular disorders on visual outcome? Are some treatment strategies more effective than others? Has the good eye been compromised? Does the age of onset matter? What is the influence of deprivation versus abnormal competition between an affected eye and a fellow good eye? These are all important questions. In answering these questions, we often turn primarily to the “gold standard”—Snellen acuity. But good questions. In answering these questions, we often turn primarily to the “gold standard”—Snellen acuity. But good

In this issue of the journal (p 991), Kelly and Buckingham identify another abnormality of motion perception in childhood amblyopia. Children aged 5–7 1/2 years, most of whom had strabismic amblyopia, were asked to identify which of two vertical bars was oscillating. A staircase procedure was used to determine the minimum amount of horizontal oscillation that could be detected reliably (coined as the “oscillatory movement displacement threshold”). Overall, thresholds in the amblyopic eyes were almost 50% worse than in the dominant eyes, which were the same as those of children with normal vision. When patients were divided into those with no stereopsis versus those with at least gross stereopsis, only those with no stereopsis showed significantly elevated thresholds for detecting oscillatory movement with their amblyopic eye. Hence those with the greatest imbalance of interocular competition, showed significantly elevated thresholds for detecting oscillatory movement with their amblyopic eye. The article by Kelly and Buckingham raises several issues for further consideration. Firstly, the results from normal children were correlated with age at the time of the test. In fact, a previous article by these same authors testing to calculate the ratio of each patient’s threshold in testing to calculate the ratio of each patient’s threshold in

16 Walsh JC, Jones CD, Barnes EA, et al. Deficits include irregular tracking of moving objects,20–22 and asymptmetrical optokinetic nystagmus (OKN) such that OKN, even when they are well above threshold,16–18 distorted perception in the amblyopic eye.20–22 Strabismic amblyopes also show deficits in their perception of motion. They judge temporalward motion to be slower than nasalward motion of the same speed, especially at slow velocities20–22; they are poor at identifying form from motion defined cues20; and they sometimes show deficits in perceiving the direction of motion.4

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