cases underwent trabeculectomy after vitrectomy, there were no complications, such as the collapse of eye, caused by a vitreous condition. Visual prognosis is usually benign after the resolution of haemorrhages; however, cases with poor visual acuity as shown in case 2 have also been described. Taken together, because clinical features in glaucoma secondary to FAP are related to the pathogenesis of this rare complication after trabeculectomy, early postoperative hypotony should be avoided to prevent it.

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Dapsone induced haemolytic anaemia in patients treated for ocular cicatricial pemphigoid

Ocular cicatricial pemphigoid (OCP) is a systemic autoimmune disease of unknown aetiology. It causes a chronic, scarring conjunctivitis and frequently affects other mucous membranes. Definitive diagnosis is made by immunofluorescent staining of conjunctival tissue demonstrating IgG, IgM, and/or IgA in the basement membrane.¹ Dapsone is an immunomodulating sulphonamide and has widely been used in the treatment of mild to moderate OCP.²⁻⁴ All patients treated with dapsone show varying degrees of haemolysis.⁵ Haemolytic anaemia, requiring withdrawal of therapy, has been shown to occur in approximately 10% of patients.^{2,5}

The medical records of 12 patients treated with dapsone for ocular cicatricial disease were reviewed. Eleven of these patients were treated with dapsone as first line therapy and one as second line therapy; 11 patients had ocular cicatricial pemphigoid (OCP) and one had idiopathic cicatrizing disease. There were an equal number of male and females in this group with a mean age of 72 years (range 55-89 years). The daily dose of dapsone was consistent at 50 mg twice daily taken orally. Mean follow up time while on dapsone therapy was 19 months with a range of 1-60 months.

Six (50%) patients had reticulocytosis including four (33%) with clinically significant haemolytic anaemia with a raised mean cell volume and a steady fall in haemoglobin from baseline. The development of the haemolytic anaemia was not dose dependent and all the patients had a diagnosis of OCP (table 1).

Our cohort of patients had a much higher rate of haemolytic anaemia than previously published reports.^{2,5} Although our study sample is small, the proportion of patients with haemolytic anaemia is striking. Patients who are glucose-6-phosphate hydrogenase (G6PD) deficient are known to be more at risk of developing haemolytic anaemia.⁴ We do not routinely check for this rare deficiency in our department. Clinically significant dapsone induced haemolytic anaemia may occur more frequently than previously expected and clinicians should be acutely aware of any downward trend in haemoglobin from baseline. We no longer use dapsone as a first line agent in the management of OCP.

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Bilateral juxtapapillary choroidal neovascularisation associated with interferon alfa treatment of a metastatic cutaneous melanoma

Interferon alfa (IFN α) is commonly used in the treatment of many neoplastic diseases owing to its antiproliferative and immunomodulatory effects. IFN α is used in adjuvant therapy of melanoma stage IIa/b or higher.¹ A wide variety of ocular adverse events related to IFN therapy have been reported during the past decades.^{2,3} A case of bilateral juxtapapillary choroidal neovascularisation is described here.

Case report

A 48 year old woman reported acute vision loss in her left eye (LE) 1 week after starting treatment with IFN α for a cutaneous metastatic melanoma. She had been receiving IFN α , 5 million international units (MIU), subcutaneously three times a week. On examination, visual acuity (VA) was right eye (RE) 20/50 and LE 20/60. Funduscopy showed bilateral optic disc oedema and subretinal haemorrhages in inferior temporal and nasal arcades. To rule out any cause of papilloedema a brain computed tomography was performed, which was normal. One month later, IFN α doses were increased to 8 MIU; VA decreased to RE 20/100 and LE counting fingers at 9 feet. Funduscopy showed bilateral optic disc oedema, bilateral juxtapapillary serous retinal detachment, and subretinal haemorrhages (fig 1A, B).

Table 1 Patients with haematological complications from dapsone

Patient	Age (years)	Sex	Diagnosis	Dapsone dose	Complication
1	77	M	OCP	50 mg twice daily	Reticulocytosis (with normal Hb)
2	78	M	OCP	50 mg twice daily	Haemolytic anaemia*
3	67	M	OCP	50 mg twice daily	Reticulocytosis (with normal Hb)
4	60	F	OCP	50 mg twice daily	Haemolytic anaemia*
5	89	F	OCP	50 mg twice daily	Haemolytic anaemia*
6	85	F	OCP	50 mg twice daily	Haemolytic anaemia*

OCP, ocular cicatricial pemphigoid, Hb, haemoglobin, *dapsone withdrawn.

Figure 1 (A, B) Bilateral optic disc oedema, bilateral juxtapapillary serous retinal detachment secondary to choroidal neovascularisation and subretinal haemorrhages in the inferior retina and the juxtapapillary area. (C) Early phase fluorescein angiography, left eye. Early hyperfluorescence arising from the juxtapapillary choroidal neovascularisation. (D) Late phase fluorescein angiography, left eye. Hyperfluorescence corresponding to classic choroidal neovascularisation.

Fluorescein angiography confirmed bilateral juxtapapillary classic choroidal neovascularisation (fig 1C, D). As a severe ocular adverse event caused by IFN α was suspected, and in agreement with her oncologist, IFN α was discontinued. Three months later, VA was RE 20/40 and LE counting fingers at 2 feet, bilateral optic disc oedema had diminished but the serous juxtapapillary detachment in

her LE remained unchanged. After 14 months of follow up, VA was RE 20/200 and LE hand movement, and peripapillary fibrosis without optic disc oedema could be seen (fig 2A, B). Fluorescein angiography showed no leakage from juxtapapillary choroidal neovascularisation (fig 2C, D). Neither recurrences of her systemic disease nor other sites of metastatisation have occurred.

Figure 2 (A, B) After 14 months of follow up, optic disc oedema had resolved, and peripapillary fibrosis could be seen in both eyes. (C, D) Fluorescein angiography showed late staining but no leakage from juxtapapillary choroidal neovascularisation.

Comment

A characteristic retinopathy associated with IFN α therapy has been well described and consists of multiple cotton wool spots and retinal haemorrhages, with a reported incidence of 18% to 86%. Patients with diabetes and systemic hypertension have shown a higher frequency of retinopathy development and progression.^{2,3} In most cases, it is asymptomatic and resolves spontaneously even if the treatment is not discontinued. Few patients may develop retinal capillary non-perfusion and vascular leakage associated with severe retinal damage and vision loss.^{4,5} Atypical ocular findings have been reported, including subconjunctival haemorrhage, vitreous haemorrhage, macular oedema, retinal detachment, panophthalmitis, neovascular glaucoma, optic disc oedema, anterior ischaemic optic neuropathy, and oculomotor nerve paralysis.^{6,7} No reports of choroidal neovascularisation have been published.

Though poorly understood, pathophysiology of IFN α associated retinopathy is thought to be related to disturbances in retinal microcirculation. Guyer *et al* suggested that IFN α may cause immune complex deposition in retinal vasculature and leucocyte infiltration, leading to capillary non-perfusion, retinal haemorrhage, and nerve fibre layer infarctions.⁸ Activation of complement 5 has been suggested to occur in patients treated with IFN α and could lead to retinal capillary infarction.⁹ There is also a component of choroidal ischaemia, which could induce choroidal neovascularisation.¹⁰

Our patient developed bilateral juxtapapillary choroidal neovascularisation with severe and permanent vision loss shortly after initiation of systemic interferon, which may suggest that interferon is the major determinant in the development of these ocular changes. Moreover, improvement in optic disc oedema and choroidal neovascularisation after interferon discontinuation favours the hypothesis that they were secondary to interferon.

Variable doses and duration of IFN α therapy have been associated with ocular toxicity, which suggests an idiosyncratic drug reaction.² However, other authors suggest a dose dependent adverse reaction.³ In most cases, IFN associated retinopathy develops 2 weeks to 3 months after initiation of therapy. Interestingly, our patient reported her vision loss almost immediately after starting the therapy and after receiving very low doses (15 MIU left eye and 68 MIU right eye).

As far as we know, this is the first case of bilateral juxtapapillary choroidal neovascularisation secondary to IFN, which produced severe irreversible vision loss. This isolated case emphasises the importance of awareness of the possibility of ophthalmic complications in patients who receive IFN therapy.

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MAILBOX

Learning with a lazy eye: a potential treatment for amblyopia

In a thought provoking editorial in the *BJO*, Hoyt raised two very important issues relating to the treatment of human amblyopia.¹ Firstly, there is currently no effective alternative to occlusion therapy for treating amblyopia. Secondly, there is considerable "slippage" of visual acuity after cessation of occlusion therapy. Our sole purpose in responding to this editorial is to draw attention to some very recent work, showing significant long term improvements in visual performance in the adult amblyopic eye that, potentially, could be adapted for use as an effective alternative to occlusion therapy.

Visual perceptual learning—improved visual performance on a given psychophysical task after extensive training—is a well established phenomenon in the normal visual system.² This form of learning is often tightly coupled to stimulus characteristics encoded early in visual cortex, such as the orientation or spatial frequency (size) of a visual stimulus. The stimulus specificity of perceptual improvements through training suggests that some aspect of neural processing, whether it be the tuning of individual neurons or the weighting of synaptic connections, remains malleable or "plastic," even in the adult visual system.

Recent studies have shown that this form of neural plasticity is not restricted to the normal visual system. Indeed, with an appropriate training regime one can produce a marked improvement in visual performance of the adult amblyopic eye. Perceptual learning produces a 50–60% improvement in Vernier acuity (positional acuity)³ and, crucially, in some subjects this improvement in Vernier acuity transfers to other forms of spatial discrimination such as Snellen acuity. By way of example, one amblyopic observer improved from a pre-training value of 20/42 (~6/12), attaining 20/20 (6/6) after extensive training on the Vernier task.³ This suggests that the adult amblyopic visual system retains a great deal more neural plasticity than previously supposed. Such improvements in visual performance are not limited to acuity tasks. A longitudinal study found that training on a contrast detection task led to a twofold improvement in the contrast sensitivity of the amblyopic eye, with minimal "slippage" 12 months after the cessation of training.⁴

At present, relatively little is known about the benefits of perceptual learning in childhood amblyopia during the "sensitive period." Given the greater degree of neural plasticity in the developing visual system, one would imagine that the benefits of perceptual learning might greatly outstrip those observed in the adult population. Having said this, a recent study on the efficacy of perceptual learning in previously treated amblyopic children did not support this supposition.⁵ While the children (aged 7–10, beyond the sensitive period as defined by Hoyt) showed significant improvements after 7–10 sessions, the results were no better than those of adults. Further work with "fresh" (untreated) and younger amblyopes is required to corroborate and extend these initial findings to younger children, and to determine the "dose-response" function for perceptual learning.

Several large scale clinical studies in the United Kingdom and United States have shown that standard occlusion therapy is effective in treating human amblyopia. However, the benefits are far from universal and a significant number of children (about one third) gain little or no visual benefit despite protracted treatment.⁶ This is unfortunate given that occlusion therapy is difficult to implement, is often associated with some degree of distress to the child, and may have an impact on educational development. As Hoyt correctly notes in his original editorial, no alternative treatment strategies currently exist for these individuals. The development of perceptual learning as a clinical tool may rectify this situation and provide an alternative method both for the treatment of amblyopia and for eliminating or reversing "slippage" once treatment has ceased. Moreover, if the initial perceptual learning studies in children with amblyopia withstand further experimental scrutiny and deliver encouraging results in younger and previously untreated children, the 250 year old practice of "patching" the amblyopic eye may be supplanted or at the least supplemented by a new treatment protocol.

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NOTICES

Managing human resources

The latest issue of *Community Eye Health* (No 56) assesses the use of human resources in the delivery of eye care. For further information please contact: Journal of Community Eye Health, International Resource Centre, International Centre for Eye Health, Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK (tel: +44 (0)20 7612 7964; email: Anita.Shah@lshtm.ac.uk; online edition: www.jceh.co.uk). Annual subscription (4 issues) UK £28/US\$45. Free to developing country applicants.

9th Frankfurt Marburg Vitreoretinal Symposium

The 9th Frankfurt Marburg Vitreoretinal Symposium will be taking place in Marburg, Germany on 11-12th May 2006. For further information please contact the Congress OrganisationGerling, PO Box 29 03 33, D-40530 Dusseldorf, Germany (tel: +49 211 59 22 44; fax: +49 211 59 35 60; www.congresse.de).

8th EUNOS Meeting – 2007

The 2007 European Neuro-ophthalmology Society meeting (EUNOS; www.eunos.web.org) will be taking place in Istanbul, Turkey on 26-29th May 2007. For further information please visit www.eunos2007.org or contact Pinar Aydin aydinp@eunos2007.org

Teaching courses on Retinal and Vitreous Surgery

Several teaching courses on Retinal and Vitreous Surgery have been organised throughout 2006 and 2007 around the world in association with the International Faculty. For further information on each of these