

COMMENTARY

Photodynamic therapy for age-related macular degeneration

Photodynamic therapy is a new treatment for age-related macular degeneration, the leading cause of irreversible blindness in people over the age of 50. There are 13 000–14 000 blind registrations each year in the United Kingdom, 50% of which are due to age-related macular degeneration [1]. This is an underestimate of the problem. The Framingham study found that 2.2% of the population over 65 years were blind in one or both eyes from age-related macular degeneration [2].

There are two forms of age-related macular degeneration—‘dry’ and ‘wet’. The dry form accounts for about three-quarters of cases and is due to atrophy of the pigment epithelial layer underlying the retina. It occurs insidiously and visual loss is less severe than with the wet form. The wet form is due to the development of new blood vessels invading the sub-retinal space and distorting the overlying retina. These vessels may bleed, leading to sudden catastrophic loss of sight with subsequent scarring and permanent visual loss. In both types, central vision is affected and the ability to read and see faces is lost—but peripheral vision is spared.

Conventional therapy

There have been many false dawns for the management of age-related macular degeneration and most have been for treatment of the wet type. The only therapy in common use is argon laser, which destroys abnormal blood vessels in the early course of the disease before the central macula or ‘fovea’ has been affected. The symptoms at this stage are distortion of vision and it is uncommon for patients to reach an ophthalmologist in time for treatment. Fluorescein angiography shows whether laser treatment may benefit.

Even with prompt laser treatment, recurrence is common. Once the vessels have spread under the fovea, vision begins to deteriorate and may do quite suddenly if bleeding occurs. It is possible to obliterate a subfoveal membrane with conventional laser, but the power used destroys the photoreceptors and central vision is instantly lost. The eventual size of the membrane is reduced with better preservation of peripheral vision if laser treatment is carried out, but the idea of treating an eye in the knowledge that central vision will be instantly destroyed (whereas otherwise it

may persist for months or more) has not been popular with ophthalmologists or patients.

Photodynamic therapy

Photodynamic therapy has the major advantage that it can be used to treat cases where the blood vessels have already reached the fovea, without damaging the overlying photoreceptors and worsening vision. A photosensitive dye is injected via a peripheral vein and low levels of laser light are used to ablate the photosensitized subretinal membrane.

Treatment is applicable to many more eyes than the existing laser option, although it is still confined to newly presenting eyes with the wet form of the disease, of which about 50% are suitable for treatment. Those with large subretinal membranes and severe visual loss do not benefit. Potential side effects are few.

A controlled clinical trial has shown a benefit of treatment: 339 patients with age-related macular degeneration from 28 practices in the USA and Europe were enrolled; 54% of the treated group lost three lines of vision, compared with 67% of the control group. Results were better for severe visual loss, with 30% of the treated group losing six lines or more compared with 47% of the placebo group [3, 4].

Hardly a cure perhaps, but encouraging results for reducing the burden of visual loss for what is a common blinding disease. Unlike argon laser (where only one treatment is needed), photodynamic therapy requires repeat treatments—the average is six.

A note of caution was sounded by the Cochrane reviewers who, although agreeing that the benefits of treatment were unlikely to have occurred by chance, pointed out that the evidence of benefit comes from subgroup analysis [5].

Without taking into account the costs of hospital visits, fluorescein angiography and laser treatment, and considering the cost of the drug alone, each vial of verteporfin costs £850 and, assuming an average of six treatments, the cost is £5100 per treated eye. Based on the most favourable figures from the phase III trial, 17 out of every 100 patients treated will be spared loss of six lines of vision compared with controls. The cost per eye saved from severe visual loss is £30 000.

Verteporfin is licensed for use in the European Union, and is available in private practice in the

W. Franks

UK, but it remains to be decided whether the National Health Service is willing or able to afford it.

WENDY FRANKS
Moorfields Eye Hospital, City Road,
London EC1B 2PD, UK
Fax: (+44) 20 7566 2059
Email: Wendy.Franks@moorfields.nhs.uk

References

1. Evans J. Causes of Blindness and Partial Sight in England and Wales 1990–1991. Studies on Medical and Population Subjects, no. 57. London: HMSO, 1995.
2. Leibowitz HM, Krueger DE, Maunder LR *et al.* The Framingham Eye Study Monograph: an ophthalmological study of cataract, glaucoma, diabetic retinopathy and macular degeneration and visual acuity in a general population of 2631 adults 1973–1975. *Surv Ophthalmol* 1980; 24 (suppl.): 335–610.
3. Bressler M. Verteporfin therapy of subfoveal choroidal neovascularisation in age-related macular degeneration: two year results of a randomised clinical trial including lesions with occult with no classic choroidal neovascularisation—Verteporfin in Photodynamic Therapy Report 2. *Am J Ophthalmol* 2001; 131: 541–60.
4. Bressler NM, Gills JP. Age related macular degeneration. New hope for a common problem. *Br Med J* 2000; 821: 1425–7.
5. Wormald R, Evans J, Smeeth L. Photodynamic therapy for neovascular age-related macular degeneration. *Cochrane Database of Systematic Reviews*. Oxford: Update Software, 2000.