

# Intravitreal implants for treatment of macular oedema

**Daithí Ó hAnluain  
in London**

A NOVEL posterior segment dexamethasone delivery implant called Posurdex (Allergan) appears to be a promising treatment for maculopathy George Williams MD told the Moorfields Bicentenary Scientific Meeting.

Dr Williams was an investigator in a prospective randomised multicentre controlled phase II clinical trial of Posurdex for treatment of persistent macular oedema. Of the 306 patients enrolled, 165 had diabetic macular oedema, 101 had retinal vein occlusion, 26 had Irvine-Gass syndrome, and 14 had uveitis. Patients received either 350 µg of active drug, 700 µg, or no treatment.

At the 90-day follow-up, 26% of patients in the lower dose group showed a gain of two lines or more while 13.0% had a gain of three lines or more. In the 700 µg group, 35.7% showed a gain of two lines or more, and 15% showed a gain of three lines or more. Some 20% of patients in the observation group gained two lines or more during the same

period. The difference between the lower and higher dose treatment groups was highly statistically significant.

Dr Williams, director and chief of ophthalmology at the Beaumont Eye Institute in Royal Oak, Michigan, told the conference that contrast sensitivity, fluorescein leakage and retinal thickness test results all improved in treated patients.

Adverse events occurred in all three groups, including IOP increases of 25 mmHg and more. Cataract, retinal tears and detachment also occurred in a small number of cases. Vitreous haemorrhage occurred in 20% of patients in the 350 µg group and 26% in the 700 µg group. Vitreous haemorrhage did not occur in the observation group.

Dr Williams concluded that Posurdex at 700 µg clinically and statistically reduced persistent macular oedema significantly in both the overall study group and the DME subset. He said that based on these promising results, phase III trials were now underway with the Posurdex implant.

## Time-release formulation

The intravitreal implant works by incorporating a micronised sample of dexamethasone into a matrix of biocompatible and biodegradable co-polymer, PLGA (poly [lactic-glycolic] acid). After implantation the polymer releases a controlled quantity of the drug as it degrades. The only implant by-products are water and carbon dioxide.

The implant has three phases of release. Initially the drug escapes from the surface. As the surface becomes denuded, diffusion draws the drug to the exterior, and then finally erosion exposes more of the drug. Currently the implant is inserted in the vitreous through a pars plana, but ultimately it will be possible to use a 23-gauge injection system in an office setting.

The dosage of drug in the implant can be engineered to be released over weeks, several months or up to one year. The polymer can be formulated with a wide range of drugs, such as antibiotics or drugs for glaucoma, he noted.

## Intravitreal triamcinolone

Dr Williams also discussed his experience with intravitreal

triamcinolone for the treatment of diabetic macular oedema.

In one study Dr Williams treated 20 patients with 4mg triamcinolone (Kenalog). Mean pre-injection visual acuity was 20/100. Mean post-injection visual acuity was 20/65. No eyes had worse vision and there were no complications except three transient elevations of IOP. These all resolved within three months.

He described a case of a 65 year-old female with diabetic macular oedema and visual acuity of 20/200 who improved to 20/50 following treatment with intravitreal triamcinolone. He noted that intravitreal triamcinolone treatment is accompanied by a sterile inflammatory reaction 24 to 48 hours after injection in 1.5% of cases, and that there was a 1.3% incidence of culture positive endophthalmitis in combined data from clinical centres.

Many researchers have become concerned that preservatives found in standard Kenalog, including benzyl alcohol and polysorbate-80, may reduce the effect of treatment or cause adverse effects, particularly inflammation. Researchers at the



George Williams

US National Eye Institute have developed a preservative-free triamcinolone acetonide specifically formulated for use in the eye and they are currently testing it in clinical studies.

An ongoing multicentre trial sponsored by the NEI, called SCORE, (Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE) is comparing the effectiveness and safety of standard care and intravitreal preservative-free triamcinolone for treating macular oedema associated with central retinal vein occlusion and branch retinal vein occlusion.

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