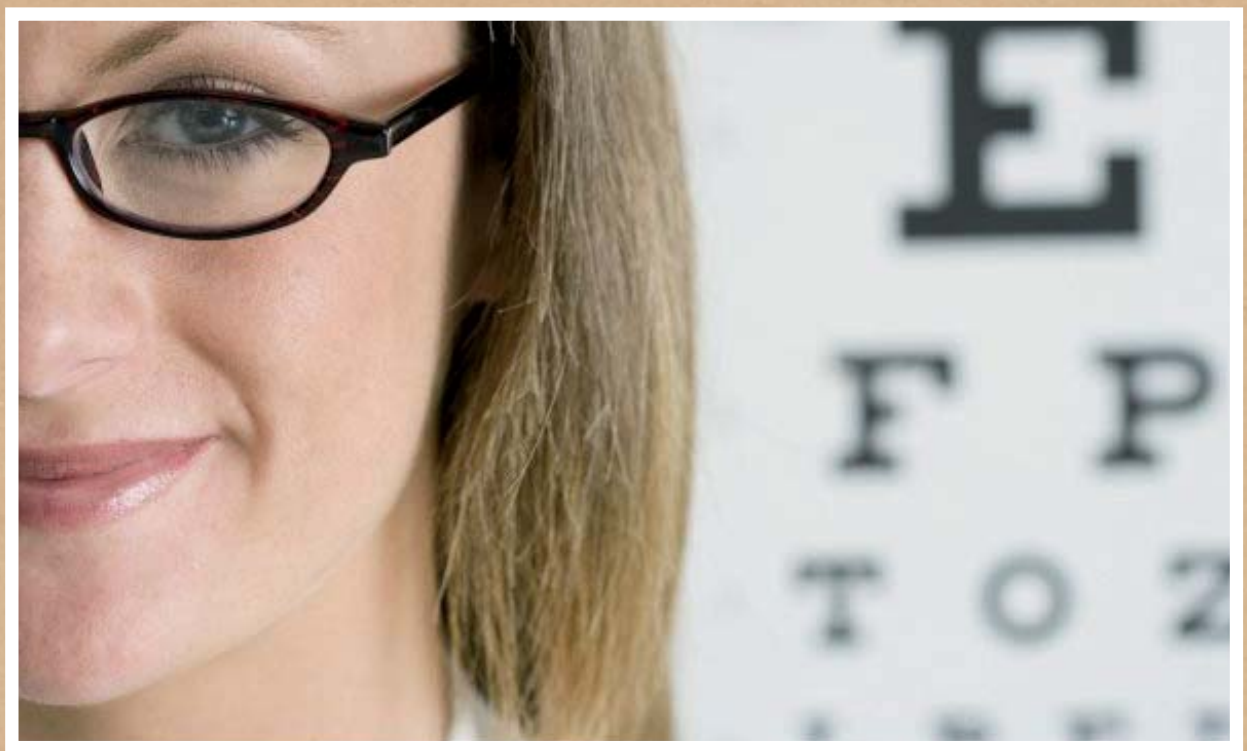


Treating Diabetic Retinopathy

Diabetic retinopathy may cause only mild vision problems and even no symptoms, initially. However, it can eventually result in blindness. Dr Vivien Lim, registrar, Singapore National Eye Centre, sheds light on this condition.

Diabetic retinopathy, a leading cause of blindness in adults in the world, is a complication of diabetes that results from damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina).

Stages of diabetic retinopathy

Diabetic retinopathy progresses from mild non-proliferative abnormalities characterised by increased vascular permeability, to moderate and severe nonproliferative diabetic retinopathy (NPDR) characterised by vascular closure, to proliferative diabetic retinopathy (PDR) characterised by the growth of new blood vessels on the retina. Macular edema characterised by retinal thickening from leaky blood vessels can develop at all stages of retinopathy.

Treatments available

Usual treatments for diabetic retinopathy are aimed at destroying abnormal blood vessels causing leakage in the back of the eye, which is the underlying cause of eye damage and vision loss. Aside from good blood sugar control, there are several treatments available for diabetic retinopathy, including laser photocoagulation and vitrectomy to remove blood and/or fibrous scar tissues from the eye.

Photo Credit : Norman Chan

Aspirin

The Early Treatment Diabetic Retinopathy Study (ETDRS) investigated whether aspirin (650 mg/day) could retard the progression of retinopathy. After examining progression of retinopathy, development of vitreous hemorrhage, or duration of vitreous hemorrhage, aspirin was shown to have no effect on retinopathy. With these findings, there are no ocular contraindications to the use of aspirin when required for cardiovascular disease or other medical indications.

Lipid lowering therapy (statins)

Dyslipidaemia has been shown to increase the risk of macular hard exudate deposition and macular edema. There is a potential role for lipid-lowering therapy (statins) as an adjunct in the medical management of diabetic retinopathy.

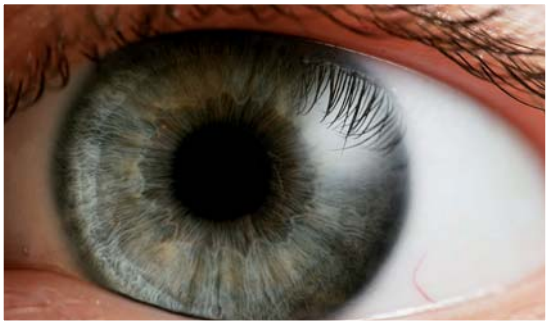
New Treatments for Diabetic Retinopathy

Several new medicines are now becoming available for the treatment of diabetic retinopathy.

Intravitreal injection of VEGF inhibitors

VEGF (vascular endothelial growth factor inhibitors) is a biochemical produced by blood vessels when they are exposed to high levels of glucose, and plays a critical role in the development of the abnormal new blood vessels characteristic of proliferative diabetic retinopathy (PDR), the most serious form of this eye disease. The trade names of these anti-VEGF agents are Macugen (pegaptanib), Lucentis (ranibizumab) and Avastin (bevacizumab).

Macugen and Avastin have both been shown to improve visual acuity and reduce retinal thickening due to diabetic macular edema, whereas Avastin and Lucentis have been shown to cause regression of neovascularization due to PDR. Avastin is far less costly than the other agents and is FDA approved for the treatment of metastatic colorectal cancer in combination with chemotherapy. However it, is not approved for use in the eye; nonetheless, many ophthalmologists are using Avastin 'off-label'—that is, for conditions other than the one it was approved for to treat PDR because it appears to be safe and effective. Studies have shown regression in the abnormal new



vessels and resolution of macular edema after intravitreal injections of these anti-VEGF agents. AntiVEGF agents, such as Lucentis, are FDA-approved, albeit far more costly.

Intravitreal injection of triamcinolone

Intravitreal injection of corticosteroids (triamcinolone acetonide) is a treatment modality in the management of diabetic

macular edema. Promising results in the short term for improving the vision in eyes with chronic diabetic macular oedema unresponsive to conventional laser treatment, reducing macular thickness, and inducing reabsorption of hard exudates, have been described in studies.

Triamcinolone is injected into the vitreous cavity by way of a very tiny needle under topical (eyedrops) anaesthesia. However, visual recovery may be limited and the effect may last only three to six months after the treatment. Complications such as glaucoma, cataract and endophthalmitis have, however, been described. In view of these reported complications, caution is advised in the use of this technique.

Other clinical trials on corticosteroids include a sustained-release drug delivery device surgically implanted inside the eye to allow constant release of the medication. In two larger multicenter clinical trials using sustained-release steroid drug delivery devices, the Oculex Study is evaluating dexamethasone and the Bausch and Lomb Study is testing fluocinolone acetonide.

Novel therapies for treatment of diabetic retinopathy

Protein kinase C (PKC) is a family of proteins implicated in the development of diabetic macular edema, and PKC inhibitors may help forestall this disease. Ruboxistaurin (Arxxant) is the first such drug shown to prevent vision loss from macular edema in patients with moderate to severe non-proliferative diabetic retinopathy.PKC has however not been approved for mainstream use yet.

Although new drugs for diabetic retinopathy hold great promise, it must be remembered that excellent metabolic control and timely laser treatment are still the current "gold standards" for managing this serious eye disease.