

OAKLEIGH EYE CENTRE

ABN: 80 836 359 971

Dr Mark Steiner 345 799X
Dr Helen Steiner 292 419A

135 Warrigal Road
OAKLEIGH VIC 3166
Tel: 03 9568 7706
Fax: 03 9568 4498
E-Mail: oakeye13@bigpond.com

DIABETIC RETINOPATHY

DIABETES AND THE EYE

THE EYE

Before looking at diabetic retinopathy it is important to understand what the healthy eye looks like and how it works.

The eyes sit inside sockets in the skull, protected by the eyelids. At the front of the eye (the visible part) is the black pupil. The pupil is surrounded by the iris, the coloured part. Directly behind the pupil and not visible to the naked eye, is the lens which is the shape of a small magnifying glass.

Inside the eye there is a transparent jelly-like substance called the vitreous. This is surrounded by a thin layer called the retina, which lines the inner wall of the eye. The retina is attached to the wall of the eye.

The eye works a bit like a camera. The light passes through the pupil and is focused on the retina (much like film). The light is picked up by special cells and information received (the picture of the outside world) is passed along the optic nerve which goes from the back of the eye to the brain, where the picture is interpreted.

At the very centre of the retina is the macula. This is the most important part of the eye, the part which 'sees' what is at the centre of your vision. The rest of the retina is responsible for the areas you see less clearly, at the edges of your vision, or out of the corner of your eye.

WHAT IS RETINOPATHY?

Diabetic retinopathy simply means disease of the retina. It occurs when diabetes damages the very fine blood vessels in the retina.

There are two different stages which characterise vision

- early retinopathy (background or non-proliferative retinopathy)
- advanced retinopathy (proliferative retinopathy or macular oedema)

OAKLEIGH EYE CENTRE

Early retinopathy is very typical of diabetes. Signs of early retinopathy include tiny bleeding or leaking spots in the retina (haemorrhages or microaneurysms) and some fatty deposits (exudates) that have escaped from small blood vessels (capillaries). This stage of retinopathy usually does not need treatment as long as the macula is not involved, but needs to be watched closely. Vision is not usually affected.

Advanced retinopathy includes macular oedema and proliferative retinopathy.

- Swelling or thickening of the macula (*macular oedema*) is the commonest reason for diabetic retinopathy affecting sight. If this isn't treated, the centre of vision is permanently damaged, which will affect your ability to read. Injection of medicine and/or laser treatment is recommended and can stabilise or improve macular oedema.
- *Proliferative retinopathy* occurs when small blood vessels in the retina become blocked from diabetes and new blood vessels then grow in response. These new vessels are fragile. They bleed easily and without warning into the vitreous so that dark red floaters are noticed. This can cause a sudden loss of vision which can take days, weeks or months to clear, depending on the size of the bleed.
- If you have a number of these bleeds scar tissue may form between the retina and the vitreous. This scar tissue may then contract and pull the retina away from the outer wall of the eye. This is called *detached retina* and needs urgent treatment. When the retina is affected in this way, people may notice a sudden loss of vision or dark shadow.
- Sometimes, the pressure within the eye increases because of diabetes and *glaucoma* occurs. In the older age group there is also a two fold increased risk of glaucoma compared to people without diabetes.

How Common Is Retinopathy?

Everyone with diabetes is at risk.

- After 15 years, about three out of four people with diabetes have some retinopathy. In the majority of people it is early with no immediate risk of sight loss.

OAKLEIGH EYE CENTRE

- About one in four get proliferative retinopathy or macular oedema, or both, after 15 years.
- If you have diabetes, there is a one in three chance that the condition has already caused some changes in your eyes, and about one chance in ten that your sight is at risk of serious damage.

Who Is At Risk?

People most at risk are those:

- who have had diabetes for many years – the longer you have diabetes, the greater the risk of diabetic retinopathy;
- whose diabetes is poorly controlled (high blood sugars) – poor blood sugar control markedly increases your risk;
- with insulin dependent diabetes (IDDM) who face a slightly higher risk of developing retinopathy;
- with diabetic kidney damage;
- with high blood pressure, high blood fats (cholesterol) and pregnancy which can make diabetic retinopathy progress faster than usual.

But everybody who has ever been diagnosed with diabetes is at risk, even a person whose diabetes is controlled with diet alone.

DIABETES AND CATARACTS

The lens of your eye is normally quite clear. A cataract means that the lens is gradually becoming cloudy, and this makes your sight gradually less clear. It also scatters light, leading to a sensation of glare. Cataracts are common among older people but in people with diabetes they can develop at a younger age and quicker.

Cataracts can generally be treated successfully. An eye surgeon removes the cloudy lens and replaces it with a new, artificial lens made of plastic. The operation is usually done under local anaesthetic and has a high success rate. In people with diabetes the result may not be as good, because existing diabetic retinopathy may worsen after surgery.

It is important that you are examined before the cataract is too advanced as injection or laser treatment maybe needed before the operation. Sometimes the cataract operation needs to be delayed until treatment can be done and the eye is stabilised. There is evidence that after cataract surgery people with diabetes may not see as well as those

OAKLEIGH EYE CENTRE

without diabetes. The final vision may not be as good as in otherwise healthy people. As with any operation, the decision about cataract surgery is taken when the likely benefit outweighs the small risk and when a significant improvement in vision seems likely.

LOOKING AFTER YOUR EYES

Fortunately you can do something to prevent loss of sight from diabetes.

- By achieving good control of your diabetes, your blood cholesterol and your blood pressure.
- By having your eyes checked regularly, signs of eye disease can be picked up early.
- Treatment can then be used to prevent retinopathy damaging your sight.

HAVE YOUR EYES CHECKED REGULARLY

It is very important to have your eyes examined regularly by someone trained to detect retinopathy. A great deal can be done to limit the eye damage if it is detected early.

Don't wait until you notice problems

Retinopathy can be quite advanced before you notice anything wrong with your sight. The earlier treatment starts, the better the chance of preserving your sight.

Are there any exceptions?

No. Every person with diabetes should have their eyes checked as soon as diabetes is diagnosed and at regular intervals after that.

You need to be examined earlier if your sight worsens between these intervals. Once any signs of retinopathy are found you need to be seen more regularly, at least every 12 months and even more frequently.

For children with diabetes the first examination may not be needed until puberty, although earlier examinations may be appropriate for some children.

OAKLEIGH EYE CENTRE

WHAT'S INVOLVED?

The vision (acuity) of each of your eyes will be checked on a chart.

To get a good view of the retina, your pupils will need to be dilated with special eye drops. These are quite safe, and the effect wears off within an hour or so. Most people drive safely after the test, but wearing sunglasses can help with the glare.

The examination of the back of the eye (retina) is usually conducted with a hand held instrument about the size of a torch. Each eye will be looked at separately.

Sometimes, photos of the retina may be taken using a special camera. For these photos, eye drops may not be needed. The photos are then examined by someone trained to diagnose retinopathy. If the photos are not clear enough, you may need to have a second set taken or see an eye specialist.

WHO CAN TEST YOUR EYES?

Anyone who has been appropriately trained to detect retinopathy can do the tests. This may be an eye specialist (ophthalmologist), optometrist, nurse, diabetes specialist or your general practitioner.

SHOULD YOU SEE AN EYE SPECIALIST?

If retinopathy is picked up, you should be referred to an eye specialist:

- for mild signs of retinopathy, a referral should be arranged soon; and
- if it is more advanced, referral should be arranged as soon as possible, or urgently, depending on the signs.

HOW OFTEN?

Once any retinopathy is found, you need to be examined at least every 1 to 2 years, or more frequently if the retinopathy is more advanced.

TREATMENT

INJECTION/LASER THERAPY

Advanced diabetic retinopathy is treated with injection or laser. A laser is simply a very narrow concentrated beam of light which can be used to treat areas damaged by diabetes.

What's involved?

OAKLEIGH EYE CENTRE

Injection or laser treatment may be carried out over several sessions and can be done in your doctor's surgery or as an outpatient in a hospital. It usually takes about 15 minutes for each session.

First you will have eye drops in the eye to be treated. This is to enlarge the pupil so that the doctor can obtain a good view of your retina. Then anaesthetic drops will be put in your eye. Injection can be done or laser applied by using a special contact lens on the cornea, which helps focus the laser beam on the retina. The contact lens is removed after treatment.

During your treatment, you will sit at a machine similar to the one normally used to examine your eyes. Your head will need to be still for the treatment.

Small laser treatments are not usually very painful but larger treatments can sometimes cause pain. If you find the treatment painful, you may be given a small injection of local anaesthetic through the eyelid below the eye to stop the pain.

You may need time off work to complete treatment. Driving your car may also be more difficult during the period treatment is being given and afterwards, particularly at night. Your sight may be worse for a few days or weeks after treatment, but it usually recovers with time.

How well does the treatment work?

Treatment is not a cure-all, but strong and consistent evidence from large trials has shown that it is very effective. In these trials, treatment prevented loss of sight in the majority of people but not in everyone.

Best results occurred in people who were seen before their sight was badly affected or before the condition was too advanced. Once your sight is damaged, treatment may not bring it back. This is why regular checks are recommended even before you notice any change in vision.

Treating macular oedema

OAKLEIGH EYE CENTRE

For macular oedema, an OCT or fluorescein dye test is needed beforehand. This shows the 'leaky' areas needing treatment. Photos of the retina are used to guide the doctor when applying laser treatment.

Macular oedema is usually treated in one session, but sometimes this may need to be repeated if the swelling does not settle properly.

Treating proliferative retinopathy

The problem with proliferative retinopathy is the new blood vessels which grow. These can bleed easily and cause scarring.

Laser is applied over large areas of the outer retina. This causes the new blood vessels to disappear. Treatment is usually spread out over a few months, as each eye takes several sessions to treat properly.

Treatment is only given if you have new blood vessels forming because of the slight risk of damage to your sight, particularly night vision and close vision for reading. For example, you might find after laser treatment that on the eye test chart, you can no longer read one or two lines that you could previously read before the laser treatment. Your vision at night and what you can see out of the corner of your eye may be reduced. This can also be caused by the diabetic retinopathy itself.

Combined treatment

If you have both proliferative retinopathy and macular oedema, your doctor will usually treat the macular oedema first.

SIDE EFFECTS

With any medical treatment, as well as benefits, there are side effects which your doctor should discuss with you, so you can make an informed decision.

Mostly these side effects should not stop someone with advanced retinopathy having laser treatment. You should discuss the benefits and risks with your doctor so that you are satisfied you have a clear understanding before you proceed.

The most frequently experienced side effects are listed below. In most cases these are mild, and you won't necessarily experience all of them.

Pain

OAKLEIGH EYE CENTRE

Some people find that laser can be painful, particularly towards the end of laser treatment. Most can cope with the discomfort as the session only lasts about 15 minutes.

The pain settles fairly quickly once laser treatment is completed. If the discomfort during laser treatment is too great, then future sessions can be given after a local anaesthetic injection.

Blurring of vision

Often your vision is blurred in the period immediately after treatment. This typically lasts for a few hours or days, though in some cases, may last for some weeks. Large laser sessions can sometimes cause a shortsighted change in vision that can last for weeks, but which eventually recovers.

A worsening or loss of sharpness in vision in the months after laser treatment can persist in some people. This may happen because the retinopathy has such momentum it continues to progress for a while even though laser treatment is under way.

Bleeding from diabetic new vessels may be another cause of blurred vision. It is not caused by the laser, but can occur at any time, until the vessels go away in response to the laser treatment. This is another reason to detect retinopathy early, so laser treatment can be started before your vision is affected and retinopathy is too advanced.

Increased glare sensitivity

This may happen because of the retinopathy itself, or be caused by the laser. It tends to improve and be less noticeable a few months after the laser treatment is completed. Wearing sunglasses generally helps.

Loss of side vision

A form of tunnel vision can result if large areas of the retina need to be treated. Although this can be picked up by testing the visual field, most people are not aware of it. For most people, laser treatment does not cause enough loss of visual field to prevent safe driving.

IS A FLUORESCEIN DYE TEST NEEDED?

OAKLEIGH EYE CENTRE

This test involves an injection of fluorescein, a yellow dye into a vein in the arm or hand. The dye test maybe indicated for laser treatment of macular oedema and may be needed in follow-up visits.

For proliferative retinopathy, the dye test sometimes helps identify sources of bleeding, but may not be necessary in all cases.

A dye test is never needed to screen people for retinopathy or when retinopathy is detected very early.

The most common side effect of the dye test is nausea. It occurs in about one in three people but usually only lasts for a few seconds. Occasionally a mild allergic reaction or more serious side effects occur, but these can be treated. It is normal for your urine to turn yellow for a day or so after the test.

What follow-up is needed after laser treatment?

Close and regular follow-up after laser treatment is very important, as many people need further treatment if retinopathy fails to respond or if it recurs.

WHEN IS VITRECTOMY SURGERY NEEDED?

If proliferative retinopathy causes a large bleed that does not clear, then after some months an operation could be considered. The operation is termed vitrectomy as it removes the vitreous jelly of the eye together with blood and scar tissue.

In a large trial this operation was found to be of benefit. For less severe bleeding and in older people, the benefits are much less. So in this case it would be better to wait and see if the condition resolves itself.

The operation may also be used if new blood vessels cause scarring to pull on the retina (detached retina). Laser treatment maybe needed before the operation to achieve the best results.

What about side effects?

Further bleeding or cataract formation are the commonest side effects of vitrectomy. Eyes can go blind after the operation because of glaucoma or scarring.

LIVING WITH DIABETES

OAKLEIGH EYE CENTRE

Diabetes is a condition which affects the body's ability to use and store sugar (glucose). In Australia perhaps 1 million people have diabetes, and there are many who have not yet been diagnosed.

Diabetes can damage your eyes, and if left unchecked and untreated can eventually lead to blindness. In fact, it is the cause of 10% of blindness in Australia, and is the most common cause of blindness in people under 65.

THERE ARE TWO TYPES OF DIABETES

Insulin dependent diabetes mellitus (Type 1) affects one in ten people with known diabetes and usually occurs in young people before age 30. It is caused by too little insulin being produced by the pancreas and is treated with insulin injections. These days, it is common to use several injections of short-acting insulin before meals.

Non insulin dependent diabetes mellitus (Type 2) is the most common (nine in ten people with diabetes) and usually occurs in people over the age of 30. The body continues to produce insulin, but the insulin can't be used effectively. Many people with non insulin dependent diabetes need tablets to increase the release of insulin. After some time, about one in four will need insulin injections.

Symptoms of Diabetes

Symptoms from diabetes are caused by the high level of blood sugars and can include:

- increased thirst and urination;
- tiredness and lack of energy;
- weight loss or weight gain;
- skin or vaginal infections; and
- blurred vision.

These symptoms may occur suddenly or develop slowly over months or years. However, many people may not have any symptoms.

HELPING YOURSELF

OAKLEIGH EYE CENTRE

The aim of diabetes treatment is to keep your blood sugar under control. The key is to adopt a healthy lifestyle, including:

- a balanced diet high in fibre and low in fat and sweet foods;
- regular exercise;
- stopping smoking; and
- reducing alcohol intake.

Self monitoring your blood sugar is the best way to know what the body is doing and to balance the effects of food and exercise. It is not complicated and can be fitted into your usual activities as part of a regular routine.

WHY TIGHT SUGAR CONTROL HELPS

Keeping your blood sugar under control helps you feel well. It also decreases the risk of long-term damage to the eyes, kidneys and nerves.

Other health problems affecting your cardiovascular health such as high blood pressure, high cholesterol, being overweight and smoking, all contribute to this long-term damage. In particular, they increase the risk of blockages occurring in the heart, brain, legs and elsewhere.

This is why people with diabetes have a greater risk of heart attack, stroke and circulation problems in the lower legs, leading to risk of gangrene and amputation.

WHY YOU NEED TO BE IN CONTROL

Because there are so many health problems that can arise with diabetes, the best person to put in charge of your treatment is **you**. You are the only one who has the whole picture, so you are in the best position to keep your diabetes team informed. Remember to advise and seek help from your GP or diabetes nurse, diabetes specialist, dietitian, pharmacist, podiatrist, optometrist or eye specialist as problems arise.

Diabetes Australia can also help. There are Associations in every State and Territory.

QUESTIONS

OAKLEIGH EYE CENTRE

My diabetes is very mild, only needing diet control. Do I still need to have my eyes checked regularly?

Yes, you do. The risk is only slightly reduced in people with diabetes controlled by diet alone. Your diabetes may also have been present for longer than you realise, and this could increase your chances of developing retinopathy.

Can I still develop retinopathy if my diabetic control is very good?

Yes, but by maintaining good blood sugar control you reduce your risk considerably. However, other factors contribute, such as blood pressure and cholesterol, and as well there are likely to be some factors we don't yet know about.

Is there any point putting a big effort into diabetic control if I already have retinopathy?

Yes, there is. There is strong evidence that progression can be slowed by 50%. However, it is not known whether there is any benefit for very advanced retinopathy. It seems likely that good control may also slow progression of other diabetic effects, like kidney damage.

I notice that my vision fluctuates a lot. Does this mean I am developing eye damage?

Yes, it can. These changes can be due to retinopathy. However, they can also result from changes to the sugar content of the lens in the eye, due to fluctuating blood sugar, particularly if there is a sudden change. Such lens changes may not cause any permanent damage.

I am worried that my eye will move during the treatment.

With care and attention, most people can keep still enough during the treatment for it to be given safely.

I am worried about the pain from the laser.

Treatment of macular oedema is not uncomfortable for most people. However, treatment for proliferative retinopathy can be painful for a few minutes. Some people are not bothered at all by the laser, while others find it quite unpleasant. Your eye doctor will start slowly to see how you cope.

If pain from the laser is difficult to cope with, treatment can be spread over a few sessions or these can be shortened. If you still feel too much

OAKLEIGH EYE CENTRE

discomfort, your doctor can give a numbing injection through the lower eyelid to areas around your eye. This will stop all pain during the treatment, though some pain may return in two or three hours after the injection wears off.

I have heard that the laser can blind you.

In many people retinopathy is detected too late, after a bleed or with advanced macular oedema. Retinopathy may then continue to progress until vision eventually fails. In some advanced cases, retinal detachment may still develop, despite laser treatment. This illustrates the need to detect retinopathy before it is too advanced. Laser is extremely effective in most patients treated, but benefits may not occur for some months after it is finished. Vision may improve for a long time as the retinopathy stabilises.

Very rarely, the centre of vision can be treated accidentally by the laser and sight can be damaged. For this reason, laser should not be considered until there is a definite risk to vision.

After laser is finished, will I need it to be repeated each year or so?

It depends whether the laser treatment is for macular oedema or proliferative retinopathy. For macular oedema, laser treatment sometimes needs repeating if the disease stays active. For proliferative retinopathy, the laser treatment may extend over some months or even up to a year before all the necessary areas have been treated, after periods of follow-up. Once the new blood vessels shrivel, and adequate laser treatment has been done, further laser is rarely needed. The benefits of laser treatment appear to be lifelong.

The information in this handout has been taken from *Diabetes and Your Eyes* (June 1997) which is a consumer guide for the management of diabetic retinopathy produced by the National Health and Medical Research Council.