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## Glaucoma

### What is glaucoma?

Glaucoma is the name for a number of eye conditions in which the optic nerve is damaged at the point at which it leaves the eye. If it is undetected or untreated loss of vision can occur. This is usually asymptomatic at first as it affects peripheral, not central, vision but it may progress to central visual loss or tunnel vision. In the UK glaucoma affects about 2% of the population over the age of 40.

Unfortunately vision that has been lost in this way cannot be restored but the great majority of people diagnosed with glaucoma retain useful vision throughout their lifetime with treatment and careful monitoring. Therefore it is important to make sure that your sight is not at risk, usually by regular assessment by your optometrist.

### What causes glaucoma?

Glaucoma often, but not always, occurs as a result of increased pressure within the eye. A fluid, called aqueous humour, fills the front of the eye. It is made by tissue located behind the iris, passes forward through the pupil (the hole in the centre of the iris) and leaves the eye through tiny drainage channels in the angle between the front of the eye (the cornea) and the iris. Normally the fluid produced is balanced by the fluid draining out but the pressure can rise if drainage is restricted. If the pressure gets too high it may damage the optic nerve. How much damage occurs and how quickly depends on how high the pressure is, for how long it has been raised and how much it varies.

However, some people with glaucoma have an eye pressure within normal limits but damage occurs because there is a weakness in the optic nerve structure or perhaps because of a poor blood supply to the nerve.

In many cases both the pressure and predisposing factors in the optic nerve are involved but to a varying extent. Eye pressure is largely independent of blood pressure.

## **Are there different types of glaucoma?**

Glaucoma can be divided into four main types.

The most common is chronic, or open angle glaucoma, in which the aqueous humour reaches the drainage channels as the angle of the eye is "open" but it is restricted in outflow at a microscopic level so that the eye pressure rises very slowly and there is no pain to show there is a problem. The field of vision gradually becomes impaired. As the gaps in the peripheral vision in one eye may be made up for by the other eye a lot of damage can have occurred before the sufferer knows that there is a problem.

Angle closure, or narrow angle glaucoma is much less common in the UK. It may occur suddenly, acute angle closure glaucoma, when there is a sudden and complete blockage to the outflow of aqueous fluid from the eye. This is because a narrow 'angle' closes to prevent fluid ever getting to the drainage channels. This can be quite painful and will cause permanent damage to sight if not treated promptly. Some people have mild attacks of angle closure which can be a warning of the risk of an acute attack. A chronic form of angle closure can also develop slowly in some people who are predisposed because of narrow angles.

There are two other main types of glaucoma. When a rise in eye pressure is caused by another eye condition this is called secondary glaucoma. There are many reasons this can occur and at times the predisposing cause may need treatment too. Developmental glaucoma is a rare condition where the drainage angle of the eye has not formed properly leading to a high pressure. This can be associated with other developmental abnormalities of the eye.

## **Are some people particularly at risk of chronic glaucoma?**

There are several factors which increase the risk:

1. Age. Chronic glaucoma becomes much more common with increasing age. It is uncommon below the age of 40 but affects 2% of people over this age and 5% over 80.
2. Race. If you are of African or African-Caribbean origin you are more at risk of chronic glaucoma and it may come on somewhat earlier and be more severe. People of Asian origin are more at risk of angle closure glaucoma.
3. Family. If you have a close relative (parent, brother, sister or child) who has glaucoma then your risk of developing it is increased about four times which is why eye tests at the optometrist are free over the age of forty.
4. Short sight. People with a high degree of short sight are more prone to chronic glaucoma.
5. Diabetes is believed to increase the risk of developing this condition.

## **What is ocular hypertension?**

Raised pressure within the eye is a risk factor for developing glaucoma but does not always progress to glaucoma. The upper limit of 'normal' is 21 mm Hg and the average eye pressure is 16 mm Hg. As the risk of developing glaucoma increases with higher pressures some people are treated to lower the eye pressure, others are monitored carefully.

## **Detection and Treatment of Glaucoma**

Most people with glaucoma are unaware that there is a problem. It is usually identified by an optometrist at a routine sight test. It is vital to have regular eye tests particularly if you are at increased risk of developing glaucoma. As glaucoma becomes much more common over the age of forty you should have eye tests at least every two years.

## **How is chronic glaucoma detected?**

It is important to ask your optometrist for all three glaucoma tests. This has been shown to be much more effective in detecting glaucoma than just having one or two. These tests are:

1. Viewing your optic nerve by looking into your eye with a special torch or at a type of microscope.
2. Measuring the pressure in the eye.
3. Assessing the field of vision, this is usually done using special equipment where you are shown a sequence of spots of light on a screen and asked to indicate which ones you can see. All these tests are very straightforward, don't hurt and can be done by most high street optometrists (opticians).

If the tests show an abnormality you will then be referred to an eye specialist for a further assessment and treatment if necessary.

## **How is chronic glaucoma treated?**

The main treatment for chronic glaucoma aims to reduce the pressure in your eye. Some treatments also aim to improve the blood supply to the optic nerve. Treatment to lower the pressure is usually started with eye drops. These act by reducing the amount of fluid produced in the eye or by opening up the drainage channels so that more aqueous fluid can drain away. Regular check ups are then needed to make sure that the pressure is adequately controlled and progressive damage is not occurring. The frequency of these is then tailored to the individual persons needs. Sometimes this is not enough to prevent further changes from glaucoma so the specialist may suggest either laser treatment or an operation called a trabeculectomy to reduce the

pressure in the eye. Your specialist will discuss with you which is the best method in your particular case.

## **Can chronic glaucoma be cured?**

Although damage already done cannot be repaired, with early diagnosis and careful regular observation and treatment, damage can usually be kept to a minimum, and good functional vision retained throughout your lifetime.

## **My practice**

I see people referred by their GP or optometrist with ocular hypertension (high pressure in the eye) or possible glaucoma. As an initial assessment I would check the eye pressure, examine the front part of the eye with a microscope to look for any secondary causes of glaucoma, look at the drainage angle of the eye (called gonioscopy) and then dilate up the pupils with drops to be able to look into the eye to look at the optic disc which is where the optic nerve leaves the back of the eye. All of these tests are straightforward and don't hurt. As I am able to arrange to do a test of the peripheral field of vision at the same visit I am then able to put the results of the tests together and advise whether treatment or further monitoring is required.