

Glaucoma in the older patient

Glaucoma is the name given to a group of conditions in which the optic nerve suffers a characteristic form of damage at the back of the eye which is often associated with a raised level of intraocular pressure. World Glaucoma weeks takes place this month (March 11-17) and aims to educate people about how to assess their risk for glaucoma and to be aware of the importance of regular eye exams and disease detection. It also seeks to provide support for diagnosed patients and for members of the advocacy community.

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Glaucoma is the name given to a group of eye conditions that cause a characteristic type of damage to the visual field. It is the leading cause of preventable blindness in the UK. Its prevalence is about 2% of the population over the age of 40 years¹ and this prevalence rises with age to 8% plus in those aged 80 years and over.¹ With the population over the age of 80 years expected to rise by nearly 1.5 million in the next 20 years, the management of this potentially blinding condition in this group is particularly important if an increase in glaucoma blindness is to be avoided, together with the personal and social costs that such blindness causes.

Primary open angle glaucoma

The most common form of glaucoma is primary open angle glaucoma (POAG), which gives no warning symptoms to alert the individual concerned to the risk to their sight before diagnosis and this same feature

can cause problems in the management of the condition. The NICE glaucoma guideline (CG85) offers detailed guidance on the management of POAG and its precursor condition; ocular hypertension.² It also offers guidance on the patient information materials that are considered necessary to aid good patient compliance (later endorsed by the NICE Quality Standard on Glaucoma released in March 2011), but there is no advice on the management of glaucoma specific to older people.

The pharmacological treatment referred to in the guidance includes a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic, or a preservative-free preparation if the person is allergic to preservatives. More than one agent may be needed concurrently.

Intraocular pressure

The basics of glaucoma management (regardless of the type of glaucoma) are to

reduce the level of intraocular pressure (IOP) to a level at which further damage to the field of vision is either prevented or reduced to a level at which the patient will retain useful sight for life. This reduction in IOP is usually achieved through the use of ocular hypotensive eye drops, which act either to reduce the amount of aqueous humour being produced by the ciliary body or to increase its outflow from the eye through the trabecular meshwork, or through the uveoscleral pathway (or in some cases, they act in both ways). Beyond medical therapy (eye drops) there are various laser techniques that can be employed and also filtration surgery.

As with all chronic conditions, one of the key issues in the management of glaucoma is that of compliance, adherence or concordance with the prescribed management regime. The fact that glaucoma is usually asymptomatic in its early and mid stages (when treatment is most effective) adds to the difficulty of achieving good compliance and the inconvenience of eye drop

Box I: Treatment options

Beta blockers. This type of drop includes timolol (Timoptol), timolol maleate (Nyogel, Tiopex), carteolol (Teoptic), levobunolol (Betagan) and betaxolol (Betoptic). These drops reduce the production of fluid in the eye and are used once in the morning or twice a day. The main possible side effect is asthma. Patients should not take these drops if they suffer from, or develop, asthma. However, most patients have no problems when they take the drops. Other possible side effects include a slow pulse, dizziness, tiredness or a reduction in the amount of exercise patients can do. In some patients they may cause depression, loss of libido or impotence.

Alpha agonists. This type of drop includes brimonidine tartrate (Alphagan) and Apraclonidine (Iopidine). These drops reduce the production of fluid in the eye and possibly improve the flow of fluid out of the eye a little. They are used two or three times a day. Possible side effects include a dry mouth and a feeling of being generally unwell.

Prostaglandin/prostamide analogues. This type of drop includes latanoprost (Xalatan), bimatoprost (Lumigan), travoprost (Travatan) and tafluprost (Safutan). These drops improve the flow of fluid out of the eye through the non-conventional (uveo-scleral) outflow pathway and are used once a day, usually at night. Possible side effects include a pink eye that usually improves after a few days or weeks. The iris may darken in colour and the eyelashes may grow thicker and darker. Eye colour change is most common with green or hazel eyes, which become browner, and is least common with blue eyes.

Carbonic anhydrase inhibitors. This type of drop includes dorzolamide (Trusopt), acetazolamide (Diamox) and brinzolamide (Azopt). These drops reduce the production of fluid in the eye and are used two or three times a day. Possible side effects include a bitter taste.

Cholinergic agonists. This type of drop includes Pilocarpine. This drop improves the flow of fluid out of the eye through the conventional outflow pathway and has to be used three or four times a day. A gel preparation, Pilogel, can be used once at night. The drop makes the pupil small and possible side effects include headache or eye ache (this usually wears off), blurred vision and darkening of the vision.

Combinations. Combinations of drops in the same bottle are available for patients who need more than one type of drop. These include Cosopt (Trusopt and Timoptol) and Xalacom (Xalatan and Timoptol), Combigan (Brimonidine and timolol) and Ganfort (Bimatoprost and timolol).

installation further complicates the picture. When dealing with elderly patients the problem is compounded by the physical difficulty of instilling the drops, often from very small bottles when there are problems of reduced mobility and dexterity and the requirement to take drops up to three times per day with two or three different drops to be instilled in the correct order and leaving sufficient time between each installation to avoid the problem of wash out of one drop by a subsequent drop. There is also the question of side effects.

The fact is that all eye drops used for the management of glaucoma have potentially significant side effects. These range from the potentially life threatening side effects of the beta blocker eye drops if they are absorbed into the general circulation and the patient is sensitive to beta blockade to the relatively minor side effect of increased eyelash growth that is often associated with prostaglandin treatment. When treating particularly elderly people, the potential for systemic side effects from glaucoma medications cannot be underestimated especially as many older people consider a gradual loss of condition (difficulty climbing stairs or walking up hill) to be a natural part of the ageing process. It is not possible to mention all of the potential side effects from glaucoma medications in this article, but consideration should be given to an eye drop induced problem by all medical professionals involved in the care of glaucoma patients.

Communication

The key to addressing these problems is communication and this is always a problem during an inevitably short consultation in a busy clinic. However, communication needs to be considered as being just as important as the other tests that have to be completed within the limited timeframe. It is vital that all the clues to a possible compliance problem are assessed—it is simply not sufficient to ask a patient if they are getting on alright with their eye drops and to leave it at that. Both verbal and non verbal signs need to be identified, particularly if the person in question has obvious problems with mobility, their vision or hearing—active listening is probably more important than what is said to the patient.

It is also important to remember that, at most, a patient will only remember about a third of what is said to them, which makes the provision of written information (as recommended by NICE) a key element as good quality patient information can be used to fill in the gaps in memory, or to reinforce the messages given during the consultation and a contact number for a helpline that specialises in the condition is also very helpful, so that questions or problems can be discussed in a non stressful and unhurried environment.

Failure to comply

There will be patients who, despite excellent communication

and excellent educational materials, cannot comply effectively with their treatment. In such cases it is important to discover the precise reasons for their failure to comply. In many cases the problem is a simple physical inability to manage the eye drops bottles or to get the drops into their eyes and these difficulties can often be addressed through the provision of a compliance aid. Different aids address different problems and, naturally, not all eye drop bottles fit all compliance aids. However, the International Glaucoma Association offers a “compliance briefcase” which contains samples of all the commonly prescribed eye drops for glaucoma together with a wide selection of compliance aids and information about which drops fit which bottles. This case is available free of charge to hospitals following an agreement being reached regarding its use.

In the case of a person who is unable to comply with medical treatment, either because of physical problems, memory problems (forgetting to use the drops) or because of problems with side effects, an alternative management strategy needs to be adopted. Depending on the individual circumstances of the patient concerned this may be laser treatment or surgery.

Laser treatment

Laser treatment, either argon laser trabeculoplasty (ALT) or selective laser trabeculoplasty (SLT) is the least invasive of the potential treatments, but the likelihood of achieving sufficient

control of the IOP without some additional medical therapy is limited. These options are therefore best suited where there is a problem with the number of medications being used or where there is a side effect issue with one or more of the existing medications.

These laser treatments also have the propensity to fail after a period of years, but when they do fail, the rate of rise in the IOP of the individual patient tends to be quite rapid, so regular monitoring of a patient who has undergone ALT or SLT must be maintained and the time between monitoring appointments must not be stretched too far, despite an apparently stable glaucoma. For these reasons ALT and SLT are particularly suitable for elderly patients for whom the prospect of eye surgery is particularly difficult where compliance issues are such, that significant visual loss would be expected to occur during their lifetimes if improved control of their IOP could not be achieved. Both ALT and SLT are usually day case or outpatient procedures.

Surgery

The most common form of surgery for glaucoma is the trabeculectomy operation, in which a three sided flap is cut into the sclera with the base being cut at an angle to create a controlled release of aqueous humour from the anterior chamber of the eye, to a space between the sclera and the conjunctiva leading to the formation of a drainage bleb, from which the aqueous can percolate

back into the blood stream. This operation is usually combined with a peripheral iridectomy in which a small section of the iris is removed, in order to provide an additional route for the aqueous humour to pass from the posterior chamber to the anterior chamber of the eye. There are also two non penetrating operations that may be used for the control of IOP; the deep sclerectomy and the visco canalostomy, both of which offer advantages and disadvantages over trabeculectomy, but these are not in common use in the NHS.

The trabeculectomy operation has a very high success rate when performed by glaucoma specialist surgeons with the majority of patients being able to discontinue eye drops for a period of some years after the operation.

There are, of course, risks as with any surgical procedure, but the complication rate is low in the elderly population. The most common complication is an increase in the rate of growth of an existing cataract (should one be present) and, given that cataract is a common condition among elderly people, this can present a problem in as much as a second eye operation will be required in order to remove the cataract and replace it with an intraocular lens implant. However, it is increasingly common for ophthalmologists to carry out a combined cataract extraction and trabeculectomy operation that deals with this issue.

Just as with the laser procedures described above, trabeculectomy operations can fail after a period of time. In most cases this failure is due to a scarring response at the

site of the operation (this being more common the younger and healthier the patient concerned).

If there is considered to be a probability that scarring will affect the operation, it is now common practice to use either mitomycin C or 5FU applied at the time of the operation in order to prevent this undesirable outcome. If a trabeculectomy begins to fail, the rate of rise of IOP is generally much slower than is the case with laser therapy and it is usually addressed either by adding an ocular hypotensive eye drop or by needling, in order to increase the effectiveness of the outflow. Both laser and surgical procedures can be repeated if necessary.

Other treatments

The treatments and procedures described above are usually sufficient to provide reasonable control of IOP and maintenance of the visual field of those glaucoma patients who had their glaucoma detected and diagnosed at an early stage. However, for those whose glaucoma was diagnosed at a late and probably symptomatic stage, even these techniques may not provide sufficient reduction in IOP to maintain their vision or even to prevent discomfort. In such cases there are other treatments that can be used.

Where there have been repeated failures of surgery the implantation of a shunt or tube may be considered. These implants have a fine tube inserted into the anterior chamber of the eye, leading to a reservoir that is attached to the eye itself and from which

the aqueous humour is again allowed to percolate back into the blood stream.

This form of surgery is more complicated than conventional trabeculectomy surgery and is usually performed on quite badly damaged eyes, so a tertiary referral to a glaucoma specialist surgeon is the usual practice.

In some centres the use of tubes in adult glaucomas is very rare with cyclociliary ablation being the treatment of choice. This technique uses a laser to damage the ciliary body in order to reduce the production of aqueous humour and has a high degree of success when the type of eyes being treated is taken into account.

Conclusion

Looking to the future, it is known that slow release implants are under development that will be able to provide prolonged effective medication over a period of months, thereby eliminating the issue of poor compliance and there is also ciliary body ablation system based on ultrasound that shows considerable promise as an alternative to cyclociliary ablation.

Conflict of interest: None declared

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