Could you explain the motivation behind, and objectives of, this study?

We set out to test the hypothesis that patients whose eye pressure (intra-ocular pressure) needs to be lowered would prefer laser treatment as opposed to the administration of daily drops, and that this treatment would also be more cost-effective.

There is good evidence to prove that selective laser trabeculoplasty (SLT) works just as well as daily medication and that it is well tolerated, with no pain and very few side effects or risks of treatment. Approximately 500,000 patients with glaucoma and a similar number with ocular hypertension (OHT) are potentially eligible for this treatment.

What makes glaucoma such a significant health problem in the UK? Could you explain what causes the condition and the health consequences for patients?

Glaucoma is a common, irreversible optic neuropathy affecting the vision of predominantly older adults that slowly progresses over a period of years. In the UK, glaucoma affects over 500,000 individuals, over half of whom are over the age of 65.

Every year in the UK there are an estimated 11,000 new cases of definite glaucoma in people aged over 40. According to recent National Institute for Health and Clinical Excellent (NICE) guidance a further 344,000 patients a year are referred to hospital as OHT or glaucoma suspects, of which a proportion require treatment.

How do OHT and open angle glaucoma (OAG) differ? Is it possible to reverse the damage in these conditions?

OHT is a state of raised intra-ocular pressure (IOP) without optic nerve damage that progresses to open angle glaucoma (OAG). Those with higher IOP, thinner central corneal thickness (CCT) and a family history of OAG are more at risk. Lowering IOP reduces risk of progression to OAG (dropping from 9.5 per cent to 4.4 per cent over the course of five years).

Progressive visual loss can be halted or slowed at all stages of glaucoma. IOP is the only modifiable risk factor proven to alter the course of the disease. Laser, medicines and surgery can all successfully reduce IOP, but if patients choose medical treatment, the administration of eye drops needs to be a lifelong commitment. Surgery, while effective, carries significant risks and is usually reserved for those who continue to lose vision despite other treatments. It also has a significant failure rate and often causes permanent ocular discomfort.

Could you provide some insight into the procedure of SLT? What are its advantages over existing laser treatments and standard medical treatment?

There are two main forms of laser trabeculoplasty (LT) used to treat glaucoma: argon laser trabeculoplasty (ALT) and SLT. The older ALT uses a small laser spot size, which requires very precise placement by a highly skilled operator and causes greater tissue destruction than SLT. Alternatively, SLT uses bursts of nanosecond pulses with a larger spot and is much easier to perform. It creates minimal coagulative damage that lowers IOP through increased macrophage activity and trabecular tissue remodelling.

ALT as initial treatment is more effective than topical beta-blockers at preventing visual field loss, but SLT is at least as good at lowering IOP as ALT and has fewer side effects. It is also safer and more effective in retreatment than ALT.

You have chosen not to use a placebo control in the study. Why is this and how will you avoid bias in the trial?

We could not use a masked placebo-controlled model in the study as we want to capture the full patient experience – including non-compliance with medication. This is a pragmatic study designed to match the normal practice of glaucoma treatment to ensure that its results are as widely applicable as possible.

We are minimising bias by guiding all treatment decisions using real-time, custom-made, decision-support algorithm software. This synthesises information about the patient’s current status, including visual field damage, optic nerve damage and eye pressure.

How might this trial benefit patients and the NHS in the future?

If our results are positive, then I hope that this trial will lead to a change in practice towards SLT for all new patients. This form of treatment would not only mean fewer side effects and better IOP control for the patient, but would also save the NHS money on treatment, there would also be fewer cases of blindness overall.
A new way of seeing

Research at Moorfields Eye Hospital NHS Foundation Trust in the UK is examining the potential of selective laser treatment to halt the progress of degenerative eye conditions such as glaucoma and ocular hypertension.

RAISED INTRA-OCULAR PRESSURE (IOP)

is the leading cause of glaucoma and ocular hypertension (OHT), which affects over 1.2 million individuals in the UK. These debilitating disorders not only affect the quality of life for many people living with the disease but also cost the NHS millions of pounds every year in drug costs, hospital visits and surgical operations.

Gus Gazzard, Consultant Ophthalmologist, Senior Lecturer and Chief Investigator at Moorfields Eye Hospital NHS Foundation Trust, is investigating alternative treatments - taking a closer look at the potential selective laser trabeculoplasty (SLT) has for treating degenerative eye conditions. Funded by the National Institute of Health Research (NIHR), the LiGHT trial will be utilising SLT as the primary treatment for glaucoma in 718 patients who have yet to receive any other form of treatment.

For many years, OHT and open angle glaucoma (OAG) have been treated using traditional medicinal methods, such as eye-drops. “OHT is a state of raised IOP without optic nerve damage that progresses to open angle glaucoma in some patients,” Gazzard elucidates. “Those with higher IOP, thinner central corneal thickness (CCT) and a family history of OAG are more at risk.” The aforementioned method of treating OHT and OAG has required diligent daily administration by the patient and, although successful in lowering IOP, is a difficult regime to sustain.

SEEING THE LIGHT

Gazzard and his team have been looking closely at the role conventional treatments play in lowering IOP in cases of OHT and OAG. The main aim of the trial is to discover whether newly diagnosed patients can benefit from being treated with SLT before traditional medicinal methods.

The limitations of eye-drops in treating OHT and OAG are clear: “Eye-drop therapies are widely used and can be effective, but a significant minority require more than one type of drop, with one-third of patients in the UK using more than one drug,” Gazzard explains. As well as increasing NHS costs through repeated hospital visits, many patients experience physical discomfort when administering the drops, affecting the patient’s compliance for ongoing treatment. “Long-term topical medications are often associated with pain on instillation,” Gazzard expands. “There are multiple side effects such as stinging, eye irritation, red eyes, hyper-pigmentation of eye-lid skin, iris colour changes, allergy to the drug or preservative and accelerated cataract formation.”

The LiGHT trial aims to address some of these persistent user issues and will be conducted at Moorfields Eye Hospital and five cooperating centres, as Gazzard elaborates: “It is essential to establish that the study findings are ‘generalisable’ to more than just a tertiary referral specialist centre,” Gazzard elaborates. It is especially important that the study is relatable to the larger population, with glaucoma being responsible for 12 per cent of those registered blind.

QUALITY OVER QUANTITY

Glaucoma is the second leading cause of blindness worldwide and health-related quality of life (HRQL) is an important factor when considering the future of treatment for OHT and OAG: “It is a significant cause of falls, road traffic accidents and loss of independence, even in mild asymptomatic disease,” Gazzard explains. These findings prove it is not just loss of sight that is debilitating to those with the disorder, it is their everyday lives and routines that are also affected. Gazzard and his research team have taken such considerations very seriously, working with the National Institute for Health and Clinical Excellence (NICE) to assess the quality of life of participants with a questionnaire administered at the start of the study and every following year, until the end of the study.
Looking ahead

Although there is no cure for degenerative eye conditions such as glaucoma, treatment methods such as SLT could dramatically improve the lives of sufferers. Like previous treatments, SLT is concerned with lowering IOP and so far studies have shown it is a positive step forward for current patients, as Gazzard expands: “SLT lowers IOP by 20 per cent or more in 80 per cent of patients and delays or prevents the need for glaucoma drops”. The effects are not permanent but SLT does not prejudice the effectiveness of later medical or surgical treatments.

While it is difficult to predict exact savings, there are some attractive estimates in favour of SLT. Cantor’s data suggests the NHS could save £2.4 million in direct treatment costs for new OAG patients every year. This figure rises to £16.8 million per year if a conservative 20 per cent of new OHT or glaucoma patients require treatment. If existing patients are included, this could be as high as £300 million per year.

Yet, it is not only the cost benefits that are attractive. What is most beneficial about SLT is that it does not require specialist attention or vast, associated expenses: “SLT could be readily undertaken in all non-specialist general ophthalmic units and community-based clinics, as well as specialist centres,” Gazzard states. Despite SLT not being a cure for glaucoma, the advantages of treatment appear to be far more beneficial than trying to better monitor or exaggerate the importance of routine in the traditional programme of medical treatment. With up to 75 per cent of patients currently failing to administer the drops correctly or consistently, SLT appears to be a good starting point for new patients. “I would hope that our findings will be considered robust enough to inform and determine future NICED guidance for the treatment of newly diagnosed glaucoma,” Gazzard reflects.

Expensive business

With a significant proportion of the ageing population coping with deteriorating sight, associated care and health costs are on the rise. Lowering this financial burden is a major factor behind the study, especially as current statistics show that the UK distributes 1.2 million prescriptions for traditional eye-drops every month.

Gazzard elaborates how the costs associated with sight-related disorders are affecting countries across the globe: “The total annual costs in Australia for 2005 were US $1.9 billion, of which $355 million were health system costs. Direct treatment costs in the UK were estimated at €1,337 per patient per year in 1999, up to 61 per cent of which were for medications.”